
2016 Student Research Day

Wednesday April 27
12:30-5:00 pm
Bioinformatics
Auditorium (1131)
and Lobby, UNC-
CH

Division of Speech and
Hearing Sciences,
Department of Allied Health
Sciences, University of North
Carolina at Chapel Hill

Eighth Annual Division of Speech and Hearing Sciences Student Research Day

Wednesday April 27, 2016
12:30 – 5:00pm
University of North Carolina – Chapel Hill
Bioinformatics auditorium and lobby

Welcoming Remarks

Dr. Jackson Roush

12:30 – 12:35

Oral Presentations

1. Sallie Nowell (2nd year Ph.D. Student) 12:35 – 1:00
Social-communication outcomes in preschoolers identified as at-risk for ASD at 12 months
2. Ashwaq Alzamel (1st year Ph.D. Student) 1:00 – 1:20
Sex Differences in Sensory Patterns in Children with Autism Spectrum Disorder
3. Michaela Dubay (1st year Ph.D. Student) 1:20 – 1:40
In Search of Culturally Appropriate Autism Interventions for Latino Families
4. Lisa Erwin-Davidson (1st year Ph.D. Student) 1:40 – 2:00
What Lies Beneath: Interplay of Actions Upon Introduction of a Novel Symbolic Communication Approach

Poster Session 1

2:00 – 3:15

1. Mary Beth Bardin, Natalie Fitzgerald, and Blair Schwab
Frenotomy and Breastfeeding Outcomes in Infants with Ankyloglossia: A Systematic Review
2. Chrislain Bofill, Caley Edlington
Which DBS Site has the Most Significant Speech Outcomes on Patients with PD: A Systematic Review
3. Taylor Bryant, Heather Shelton
Empowering Parents to Employ Dialogic Reading Techniques: A Systematic Review and Comparison of Dialogic Reading Interventions When Implemented by Primary Caregivers, Teachers, and Clinicians

4. Katharina Burton, Margaret T Dillon, Meredith L Anderson
Localization Abilities of Cochlear Implant Recipients in Cases of Single-Sided Deafness
5. Connelly Crowe, Kelsie Mitchell, and Nancy Vallejo
Outcomes for caregivers of post-stroke individuals with aphasia versus without aphasia: A systematic review
6. Joe Hall, Jessica Mitchell
The Effectiveness of Melodic Intonation Therapy in Treating Adults with Chronic Aphasia
7. Conner Haring, Lauren Johnson, Maggie Zenkel
Theory of Mind in Deaf and Hard of Hearing Children: A Systematic Review
8. Kim Holden
Challenges in Early Management of Children with ANSD: Analysis of the Timeline from Diagnosis to Intervention
9. Heather Mazzola, Shauntelle Cannon
Factors that Determine Hearing Aid Adoption and Non Adoption: A Systematic Review
10. Amy Munekata, Kevin Yu, Thomas Christensen
The Efficacy of Monolingual and Bilingual Treatment on Bilinguals with Aphasia
11. Michael Smith
Exploring Narrow Phonetic Transcription Training and Protocol
12. Emily Spitzer, Heather Porter, Emily Buss
Non-simultaneous Masking of Speech in Noise: Normal-hearing Children and Adults

Poster Session 2

3:30 – 4:45

1. Leah Baumgart, Cally Orme, and Megan Przybyla
Right on Cue: A Systematic Review of Cue-Based Feeding in the NICU
2. Bridget Carlile, Brian Martin
Deep Brain Stimulation: Systematic Review of Parameters for Speech and Swallowing in Patients With Parkinson's Disease
3. Nicole Corbin
Spatial Release from Masking: Effects of Simulated Unilateral Hearing Loss
4. Alison Dey, Sarah Plascyk, and Emily Rodgers
A Systematic Review of Treatment Approaches for Childhood Apraxia of Speech
5. Sarah Griffin, Ginni Lam, and Alexandra Rodriguez

Effects of Social Interventions on Vocational Outcomes of Adults with Autism: A Systematic Review

6. Alex Hamel, Taylor Petroski, and Katarina Haley
Reliability Improvements for Phonetic Transcription of Lengthening
7. Kim Holden, Dani Warmund, Michelle Hicks
The Role of A1555G in Aminoglycoside-Induced Ototoxicity: A Systematic Review
8. Lauren Johnson, Conner Haring, Kimberly Holden, Heather Mazzola, Dani Warmund, Sarah Webster, Marcia Fort, & Jackson Roush
Regional Analysis of 1-3-6 Goals in North Carolina
9. Heather Mazzola, William Hoole
Special Olympics Healthy Hearing: Outcomes of Referral and Follow-up in Seven Southeastern States
10. Morgan McGowan, Jordan Jarrett, and Katarina Haley
Narrow Phonetic Transcription of Voicing Ambiguity in Stroke Survivors
11. Jesse Palmer
Cross-Cultural Variation in Objective Measures of Voice: A Systematic Review
12. Nicole Steyl, Lauren Owczarzak
Speech-Language Tasks Administered Based on Cortical Location Stimulated During an Awake Craniotomy
13. Sarah Webster, Lucia Quiñonez Sumner, Jackson Roush
Development of an EHDI Resource Guide for Spanish-Speaking Families in North Carolina

Sallie Nowell, M.S. CCC-SLP

Social-communication outcomes in preschoolers identified as at-risk for ASD at 12 months

Research Questions

Aim 1: Identify the proportion of children who screened as at-risk for autism spectrum disorder (ASD) on the First Year Inventory (FYI) at 12 months, who meet DSM-5 criteria for social (pragmatic) communication disorder (SPCD) versus ASD versus neither at 4-5 years. **Aim 2:** Determine if parent responsiveness at 24 months in children identified as at-risk for ASD on the FYI at 12 months is predictive of social-communication skills at 4-5 years. **Aim 3:** Examine if Adapted Responsive Teaching (ART) intervention group status predicts better social communication outcomes in this sample.

Background

Early social communication weaknesses are associated with poor social inclusion outcomes in adulthood. Therefore, early identification and treatment of social and pragmatic communication deficits is critical in order to optimize outcomes. In addition, research in the area of child development has consistently linked mother's responsiveness to their young children with later developmental outcomes.

Methods

Participants: The EDP-2 sample consists of 87 children, 55 of them were re-evaluated during the summer of 2015, and 36 of those children met inclusion criteria. **Procedures:** The following measures were used: At 24 months, **Parent Responsiveness:** *Maternal Behavior Rating Scale-Revised* (MBRS). At 4-5 years, **Social-Communication Skills-** *The Children's Communication Checklist – Second Edition* (CCC-2) General Communication Composite, the *Pragmatic Rating Scale – School Age* (PRS-SA), the *Autism Diagnostic Observation Scales* (ADOS-2) social communication algorithm score, the *Vineland Adaptive Behavior Scales* (VABS-2) Socialization Domain, and the PLS-5 narrative retell task coded with the Narrative Scoring Scheme (NSS).

Results

Aim 1: No children were formally diagnosed with SPCD in this study. Thirteen had existing ASD diagnoses. **Aim 2:** None of the independent variables at 24 months accounted for a significant amount of the variance in social-communication outcomes in preschool for the majority of the dependent variables, but both Responsiveness ($p=0.03$) and Affect ($p=0.05$) were significant predictors of the CCC-2 General Communication Composite ($R^2=0.16$) at follow up. A multivariate multiple regression analysis confirmed that the combination of the MBRS subscales was not contributing significantly to the combination of the 5 dependent variables (Wilks Lambda = 0.39, $F(12, 39.98)=1.42$, $p=0.20$). **Aim 3:** Adding group membership to the models resulted in minimal changes to R^2 for most of the dependent variables indicating no differences in outcomes by group. The addition of group membership to the CCC-2 model resulted in the most change in R^2 (0.18), but Responsiveness was the only significant predictor ($p=0.02$) reflecting some instability of these preliminary results, likely due to the small sample size.

Discussion

Preliminary findings offer limited evidence to support the study hypotheses. In this small sample of 4-5 year olds who were identified as at-risk for ASD at 12 months and participated in an RCT, responsive parenting strategies only significantly predicted later social-communication outcomes on one measure, the CCC-2 General Communication Composite. Future directions include use of methods to estimate missing data and strengthen the results of the multivariate multiple regression.

Ashwaq Alzamel

Sex Differences in Sensory Patterns in Children with Autism Spectrum Disorder

Research Questions

- Do females with higher mental age show more hyper-responsive sensory patterns?
- Do females with lower mental age show more hypo-responsive sensory patterns?
- How are hypo, hyper, and mixed sensory patterns different in females than males?

Background

To develop an understanding of Autism Spectrum Disorder (ASD)'s underlying causes and identify the interaction of its manifestations, we must understand the expressions of the ASD phenotype in males and females. The ASD phenotype presents differently in females than males, varying in degree and intensity (Bailey, Phillips, & Rutter, 1996). This variation creates barriers in identifying ASD in females early (Hiller, Young, & Weber, 2015). With a ratio of approximately 4.5:1 of male to female, females on the spectrum are possibly under presented (Christensen, et al., 2016). The reasons behind the disproportion of the male/female ratio are yet unknown (Werling & Geschwind, 2013). In addition, females are identified at a later age compared to males, which can be explained by the difficulty in recognizing autistic traits in high-functioning females at an early age and the influence of the male biased in shaping our understanding of ASD symptoms (Hiller, Young, & Weber, 2015, Van Wijngaarden-Cremers et al., 2014). Furthermore, there is a tremendous need to understand ASD traits in females and how these traits differ from males, specifically related to sensory patterns. Understanding sensory patterns would enhance our understanding of the ASD phenotype and improve the identification of females earlier (Lane, Molloy, & Bishop, 2014).

Proposed Methods

Data will be collected from parents and caregivers of children between 2-12 years of age with a diagnosis of ASD. The data collection is a part of the Sensory Experiences Project (SEP)'s national survey study to examine sensory features in children with ASD. The data will be collected electronically through multiple sources, including the IAN Research Database at the Kennedy Krieger Institute and Johns Hopkins Medicine-Baltimore, the University of North Carolina at Chapel Hill Research Registry, and other autism organizations.

The sensory Experiences Questionnaire (SEQ) version 3.0, a socially validated measure for sensory behaviors, will be used to collect data from caregivers. The instrument has 105 items on sensory features in young children with ASD or other developmental disabilities in social and nonsocial contexts. The first 97 questions in the instrument use a 5-point Likert-type scale to measure the frequency of the sensory features, ranging from 1 being not frequent at all (almost never) to 5 being very frequent (almost always). Having high scores on the SEQ scale suggest more sensory features. The last eight questions are open-text to provide qualitative answers on sensory behaviors observed in these children (Ausderau et al., 2014).

Anticipated Results

1) Females with higher mental age will be more hyper-responsive; 2) Females with lower mental age will be more hypo-responsive; 3) There will be pattern differences in hypo-responsiveness, hyper-responsiveness, and mixed-responsiveness between females and males

Discussion

This study will contribute to the body of literature by providing a better understanding of how sensory behaviors differ in females and males with ASD. Moreover, this understanding of sensory behaviors in females will help scientists and clinicians improve the identification of females with ASD as well as adapt interventions to reflect their unique symptoms.

Michaela DuBay

In Search of Culturally Appropriate Autism Interventions for Latino Families

Purpose or Research Questions:

To identify intervention models, strategies, and targets that are perceived as more culturally appropriate, feasible, and acceptable for Latino families of children with autism, and to understand the variability that likely exists among Latino families.

Background

Latinos represent the largest and fastest growing minority population in the United States, and the proportion of Latino children with autism spectrum disorder (ASD) in early intervention programs (i.e., for children birth to 5 years of age) throughout the United States shows concomitant increases. Despite these changing demographics, the vast majority of evidence-based ASD interventions have been designed for and tested with mostly White, mid-upper class, monolingual English-speaking populations. Unfortunately, research suggests that interventions that are incongruent with a target population's culture may be less effective. Specifically, participation rates and response to treatment may be reduced. To either adapt current evidence-based interventions or design new interventions for Latino populations, we must have input from members of the Latino community, including knowledge of families' perceptions of intervention models and components of evidence-based practices.

Proposed Methods

Parents of children with ASD will complete two surveys regarding their perception of their child's current services, including family's strengths/needs and family involvement. Participants will include at least 30 non-Latino white English-speaking parents (NLW) and 30 Latino Spanish-speaking (LSS) parents. The second phase will involve 3-4 focus groups of 6-8 LSS parents each. The focus group facilitator will elicit parent perspectives on interventions their child has received as well as the feasibility, acceptability, and appropriateness of a number of several prominent evidence-based ASD interventions in the context of their own family.

Anticipated Results

We anticipate that NLW and LSS parents will perceive their children's interventions differently, including their perceived helpfulness and family-centeredness of those interventions, such that LSS parents will perceive the interventions are less family-centered and helpful for their families. We expect that the focus groups will provide us with enriched information about LSS parents' perceptions of their current interventions, the various structural components of interventions, and various intervention targets and strategies.

Discussion

The results of this study will help inform continued collaboration with Latino community members in an effort to adapt, modify, or create new intervention programs that are more culturally appropriate, and thus arguably more effective, for Latino children with ASD and their families. Specifically, the findings could help identify evidence-based programs that may be especially appropriate for cultural adaptation or identify appropriate components to be used when designing new interventions for LSS families of children with ASD. Future research could examine the effects of such interventions with LSS families of children with ASD. It is also hypothesized that findings here may be helpful for Latino families of children with a broad range of developmental disabilities receiving early intervention services, not only those with ASD.

Lisa Erwin-Davidson

What Lies Beneath: Interplay of Actions Upon Introduction of a Novel Symbolic Communication Approach.

Purpose: The purpose of this intrinsic case study is to thoroughly document and analyze communication and the various ways it may have changed over an eight-month period upon introduction of a novel symbolic communication intervention in a special education classroom. Prior to the introduction of this research-informed symbolic communication intervention, there was no classroom-based or teacher-focused systematic intervention in place to train these students how to use symbolic communication in a conventional manner. The seven children, ages 7 – 10 had no prior means of symbolic communication.

Background: This case study is embedded within a larger multi-site study (Project CORE) designed to help teachers learn how to systematically communicate with students who have significant cognitive disabilities and complex communication needs. Through a 4-5 year stepping up process, Project CORE is building and investigating an implementation model for a novel symbolic communication intervention. Project CORE is informed by implementation science research (Blase & Fixsen, 2013; Fixsen & Blase et al, 2013) that acknowledges there is “a clear understanding that teachers and education staff members who interact with students are the key agents of quality education” (p.4). Therefore, the intervention under study here is focused on the teacher, and the teacher’s instructional needs, but the communication system is designed to address student need, and utilizes an evidence-based core vocabulary set of 36 graphic symbols strategically arranged to maximize motor learning and visual recognition memory. The symbols are also arranged to elicit natural language modeling and encourage language expansion between teacher and student. These 36 core symbols have classroom-wide applicability. This communication intervention approach, as introduced into the classroom under study, is termed *mSAL (multi-tiered System for Augmenting Language)*, and is informed by research evidence and practices as defined for the system for augmenting language (SAL: Ronski & Sevcik, 1996; Ronski, Sevcik, Cheslock, & Barton, 2006).

Proposed Methods: The unit of analysis in this intrinsic case study is a self-contained elementary special education classroom set within a public separate school. There are seven students, one main teacher and one assistant, and related service providers. The initial research questions are: (a) How do the communication dynamics change within one classroom? (b) What is the interplay between actions, players, and contexts within this classroom unit that is implementing a novel communication intervention? and (c) Why, how, and when did the change occur? Triangulation of data is conducted through analysis of: (1) 20 sets of observational field notes, (2) semi-structured and informal interviews, and (3) classroom artifacts (e.g., work samples, communication supports, instructional resources). Multiple points of view are elicited. Data will be sorted and organized to develop themes and central ideas and analyzed using approaches described by Lichtman (2013) and Yin (2014).

Anticipated Results: It is anticipated that the results will be used to inform the continuing development of the mSAL model and more general communication interventions for students with significant cognitive disabilities and complex communication needs at the classroom level.

Discussion: The central aim of this study is to develop a better understanding of the interplay of observed communication behaviors and instructional actions that may describe how this new teacher-focused intervention influenced seven students with significant cognitive disabilities and complex communication needs. By examining multiple points of view with the classroom as the unit of analysis, we may identify both explicit and implicit variables within a student’s daily, natural environment that will tell how communication and learning perception changes over an eight-month period.

Mary Beth Bardin, Natalie Fitzgerald, and Blair Schwab

Frenotomy and Breastfeeding Outcomes in Infants with Ankyloglossia: A Systematic Review

Purpose

The aim of this systematic review was to explore whether frenotomy improves breastfeeding outcomes in newborn, full-term infants with ankyloglossia (tongue-tie) who have no comorbid craniofacial, neuromuscular, or syndromic anomalies.

Background

Ankyloglossia is a congenital anomaly in which the baby is born with an unusually short lingual frenulum. Although the World Health Organization has recommended that mothers exclusively breastfeed for the first six months of a child's life, tongue-tie can result in breastfeeding difficulties like ineffective latching, inadequate milk transfer, and maternal nipple pain (Martinelli et al., 2014). Frenotomy is a surgical procedure in which the lingual frenulum is clipped using sharp, blunt-ended scissors. The procedure is often recommended to improve breastfeeding difficulties in tongue-tied babies, but the practice remains controversial and recommendations are inconsistent (Power & Murphy, 2014). We sought to understand the current state of research on frenotomy and its impact on infant breastfeeding outcomes in the short and long term.

Methods

A comprehensive search of seven research databases yielded an initial 284 articles, which were narrowed down based on review of title and abstract. Articles were excluded if infants were bottle-fed, premature, or had comorbid syndromes or anomalies. Thirty percent of all articles initially found were reviewed for inclusion or exclusion by at least two reviewers, and overall reliability for inclusion was 91%. However, upon closer examination, many of these articles were revealed to be of low quality or poor design. Three recent (2014-2015) systematic reviews were included in the final analysis because of what they revealed about the current state of research on the topic. A controlled clinical trial was also utilized for valuable background information. No studies published after the systematic reviews met our inclusion criteria.

Results

Results from the studies included in systematic reviews varied in terms of outcome and effect, but most studies showed that frenotomy resulted in improved breastfeeding measures. Specific outcomes included latch, number of consecutive sucks during feeding, and maternal nipple pain. Complications of the surgery were found to be uncommon. All outcome measures reported were short-term, indicating a lack of research addressing long-term effects of the procedure.

Discussion

While there is a large quantity of studies on the topic, it is evident that there is a lack of quality research available. Research that employs objective outcome measures, addresses placebo effects, and examines the long-term impacts of frenotomy would allow for better conclusions.

Chrislain Bofill, Caley Edlington

Which DBS Site has the Most Significant Speech Outcomes on Patients with PD: A Systematic Review

Purpose: This study investigated the recent literature concerning speech outcomes after subthalamic nuclei (STN) deep brain stimulation (DBS) versus globus pallidus (GPi) DBS. The aim of the study was to replicate a previous review, completed by Lukins, Tisch, & Jonker (2013), suggesting greater positive speech outcomes after GPi DBS.

Background: With recent advances in technology, more patients with Parkinson's Disease (PD) may elect to undergo DBS. Due to this, it is important to understand the speech and language consequences that may result following certain DBS sites. There is emerging evidence to suggest that the GPi site is more beneficial for speech outcomes than the STN site as supported by Lukins et al.'s (2013) systematic review. However, the STN site is found to have more benefits for motor functioning and medication reduction. The proposed study will examine the latest research on speech outcomes conducted after February 2013, during which the comprehensive systematic review was completed. Our review of the literature revealed limited high quality research involving DBS sites on speech outcomes, also noted by Lukins et al. (2013). Therefore, there is a need for increased awareness and research regarding this topic.

Methods: A systematic review was conducted January through March 2016 using the inclusion criteria stated in the Lukins et al. (2013) systematic review. This includes resources gathered strictly from the PubMed database, "full text," and "English language." Case reports were excluded from the inclusion criteria. Lukins et al. (2013) included publications from 1999 through February 2013, however we reviewed the most recent literature from February 2013 and onward. 29 articles met the initial search criteria, but 23 were later excluded based on title and abstract review. Only 4 articles met the full inclusion criteria and were appraised for quality. All differences in appraisals were resolved through discussion and further analysis of the studies.

Results: Articles utilized in the review included one Case-Control study, one Randomized Control Trial Study, and two Retrospective Cohort Studies. The Case-Control Study by Tremblay et al. (2015) did not find any changes in speech outcomes. The Randomized Control Trial study conducted by Dietz et al. (2013) found that fluency is more likely to deteriorate given STN stimulation, but found no significant difference in verbal fluency when the GPi site is stimulated. After stimulation of the STN, one of the Retrospective Studies conducted by Tanaka et al. (2015) found negative voice feature changes. The final Retrospective Study conducted by Chou, Lin, & Huang (2015) found little speech improvement, with the majority of patients presenting with speech deterioration after STN stimulation.

Discussion: The results of our study indicate that more research needs to be conducted in regards to this topic. Most of the relevant studies were not directly comparing STN DBS speech outcomes to GPi speech outcomes. Now that there is foundational research documenting more negative speech outcomes from the STN DBS, this topic needs to be buttressed by higher quality studies. Once the validity of the proposed topic is found, it will have important clinical speech implications for patients with PD who may undergo DBS.

Taylor Bryant, Heather Shelton

Empowering Parents to Employ Dialogic Reading Techniques: A Systematic Review and Comparison of Dialogic Reading Interventions When Implemented by Primary Caregivers, Teachers, and Clinicians

Introduction: The dialogic reading method is a structured interactive shared reading approach involving various prompts to allow children to expand on a storybook being read to them in order to increase language and literacy skills. It has been found to be effective in increasing children's language and literacy skills through various studies. It is possible that dialogic reading implemented by parents in the home could be as effective, if not more effective, than the dialogic reading interventions children receive in school from clinicians or teachers at the small-group or classroom levels. Only limited research has been done on this comparison; therefore, a systematic review is needed.

Objective: The purpose of this systematic literature review is to compare results of dialogic reading interventions when implemented by primary caregivers versus when implemented in schools in small group or classroom settings.

Methods: Three databases were utilized: ERIC, Education FullText, and PSYCInfo. Titles and abstracts were independently assessed against inclusion criteria by two reviewers. The inclusion criteria for studies were that they must be written in English and appear relevant to answering the clinical question. The exclusion criteria were that the articles must not be off-topic or present with confounding factors evident in abstract.

Results: The search resulted in 128 titles and abstracts, with 20 of these being includable based upon title and abstract reviews. The results were further narrowed to 6 relevant randomized controlled trials (RCTs), which were then fully appraised by reviewers independently and found to range from poor to moderately-high in quality. Three articles studied parent-implemented dialogic reading, in which children whose parents received instruction in dialogic reading were compared against a control group of children whose parents had not received the same training. Two articles studied teacher/clinician-implemented dialogic reading studies, in which some teachers or clinicians were given instruction in dialogic reading and the children's results found in their groups were compared against child results found in teacher or clinician groups in which the teacher/clinician had not received instruction in dialogic reading. One article compared classroom-wide teacher-implemented dialogic reading, small-group teacher-implemented dialogic reading, and parent-implemented dialogic reading with no obvious control. The majority of the RCTs found no statistically significant gains in either receptive or expressive vocabulary, regardless of whether parents or teachers/clinicians were implementing the dialogic reading intervention. All studies evaluating increases in mean length of utterance found statistically significant gains for the dialogic reading group. Statistically significant gains were noted in individual studies for a myriad of other oral language and language complexity tasks, such as number of words used and number of multiword utterances. No clear differences between parent implementation and clinician/teacher implementation were seen in any of these findings.

Conclusion: Because no differences were seen between parent implementation and clinician/teacher implementation, there is nothing to suggest that parents cannot implement dialogic reading techniques in the home as well as clinicians or teachers can in the classroom. Parents can be encouraged to implement dialogic reading techniques in the home for the time being. Studies with greater power and longer periods of intervention implementation need to be conducted in order to properly interpret the effects of dialogic reading when used by caregivers in the home as compared to when used by teachers or clinicians in small-group or classroom settings.

Katharina Burton, B.S., B.A.; Margaret T Dillon, Au.D.; Meredith L Anderson, Au.D.
Localization Abilities of Cochlear Implant Recipients in Cases of Single-Sided Deafness

Purpose: To assess whether cochlear implant subjects with SSD experience subjective and objective improvements in sound localization.

Background: Single-Sided Deafness (SSD) can be defined as moderate-to-profound sensorineural hearing loss with limited speech perception benefit in one ear and normal hearing in the contralateral ear. Despite the presence of one normal hearing ear, patients with SSD typically experience difficulty with sound localization and understanding speech in noise, in addition to a reduced quality of life. Current hearing technology options for patients with SSD include contralateral routing of signal (CROS) hearing aids and bone conduction devices.

The main advantage of CROS hearing aids and bone conduction devices is the ability for the patient to hear sounds coming from the affected side. However, both of these technologies send the signal to the normal hearing ear, which keeps the patient in a unilateral listening environment. This results in the inability to take advantage of binaural listening cues to help improve speech understanding in noise and localization of environmental sounds. Stimulation of the auditory pathway on the affected ear may provide binaural cues to patients with SSD.

Cochlear implantation may provide a benefit over the current hearing technology options for SSD, as it stimulates the auditory pathway on the affected side. This may permit bilateral stimulation of the auditory pathway, potentially allowing the patient to take advantage of binaural cues to improve speech understanding in noise, localization, and quality of life.

Methods: All participants received a cochlear implant as part of an FDA clinical trial investigating cochlear implantation in cases of unilateral hearing loss. At the preoperative interval, participants were tested in two conditions: 1) unaided, and 2) with a bone-conduction hearing aid (BCHA; BAHA Intenso on a test band). During follow-up intervals, subjects were tested with their CI plus the normal hearing ear (CI+Better Ear) to assess whether the addition of the CI improved localization abilities. Participants were seated in an 11-speaker array. 200ms noise bursts were played at varying intensities, and participants verbalized which speaker they believed the sound originated from.

Results: The difference between the speaker location and the subjects' response on each trial was reported in root-mean-square (rms) error, where a lower value is indicative of better performance. Initial results between conditions were compared using a Welch's t-test, with $\alpha < 0.05$. There was no difference in the rms error between the unaided and BCHA conditions ($p = 0.24$) at the preoperative interval. There was a significant difference between the preoperative unaided condition and the CI+Better Ear condition after 1-month ($p < 0.001$) of listening experience with the cochlear implant. Participants also reported a significant improvement in localization abilities between the preoperative and 1-month follow-up interval on the speech ($p < 0.001$) and spatial ($p < 0.001$) subscales on the Speech, Spatial and Qualities (SSQ) questionnaire.

Discussion: There was no difference in localization abilities between the unaided and BCHA conditions. A significant improvement in localization with the use of the cochlear implant was found on objective and subjective measures. This improvement was noted as early as 1 month of listening experience. Localization abilities exceed performance with a currently approved treatment option for SSD (bone-conduction device).

Patients with unilateral hearing loss who meet cochlear implantation candidacy criteria on the affected side may experience improvements in localization abilities with the use of a cochlear implant.

Connelly Crowe, Kelsie Mitchell, and Nancy Vallejo

Outcomes for caregivers of post-stroke individuals with aphasia versus without aphasia: A systematic review

Purpose:

This systematic review aimed to examine the existing research comparing outcomes for caregivers of post-stroke individuals with and without aphasia.

Background:

According to the International Classification of Functioning, Disability, and Health (ICF), *third-party disability* describes the effect of an individual's health condition on a caregiver's disability (WHO, 2001). However, little research has used the ICF to determine the impact of aphasia on caregivers, although one study has suggested that potential handicaps may include changes in family members' communication (Grawburg, Howe, Worrall & Scarinci, 2013; Le Dorze & Brassard, 1995). While caregivers of stroke survivors with and without aphasia endure a number of challenges, the communication difficulties experienced by people with aphasia (PWA) can lead to additional strain on the caregiver. Understanding the differences in experience between caring for PWA and caring for people without aphasia (PWOA) can have significant implications for the counseling and rehabilitation processes.

Methods

A systematic review analyzing the strain and burden of caregivers of individuals post-stroke with and without aphasia was published in 2006 and little information was found specifically regarding caregivers of PWA (Rombough, 2006). The current systematic review focused on literature published between January 2004 and February 2016 in order to avoid overlap with the previous systematic review and build upon the existing findings that specifically compare caregivers of PWA and caregivers of PWOA. The search strategy from the 2006 study was replicated and studies were drawn from the following databases: PsycInfo, CINAHL, and PubMed. Out of 305 total results, two studies met the inclusion criteria, one being the previous systematic review from 2006 and the other being a qualitative outcomes study also published in 2006. All three researchers independently appraised both articles and assessed them for overall quality to determine eligibility for inclusion.

Results

There are a number of inconsistencies in the research related to this area. The review did find that survivor and caregiver communication challenges were rated as more severe for PWA than for PWOA; However the validity of these studies are questionable, due to the lack of adequate sample sizes, unreliable methods of participant selection, differences in assessments, and overall lack of high quality research that currently exists.

Discussion

The articles reviewed for the study suggest negative stroke-related outcomes for caregivers of PWA. However, the inconsistencies between the articles and the lack of significant findings prevent a definitive conclusion from being drawn, suggesting an overall lack of research related to this topic. It was determined that there is a clear need for further research comparing these two groups, as well as research that focuses specifically on the effects of aphasia on caregiver QOL. Additionally, development of a universal and reliable assessment to measure the multiple facets of caregiver burden, strain, and QOL may be useful in furthering the evidence base in this area. These findings also have implications for the role of speech-language pathologists in providing support and strategies for caregivers of PWA.

Joe Hall, Jessica Mitchell

The Effectiveness of Melodic Intonation Therapy in Treating Adults with Chronic Aphasia

Purpose

The purpose of the current systematic review was to determine through current research if Melodic Intonation Therapy (MIT) or modified MIT results in improved speech and language measures in adults, 40 years or older, with chronic aphasia.

Background

Individuals suffering from chronic aphasia have often completed speech therapies with no significant improvements in speech and language. The observation that these same individuals were capable of singing non propositional phrases led to the development of MIT in 1973. MIT has been reported to improve speech and language in individuals with aphasia when other treatments have failed. Elements of MIT include rhythmic finger-tapping and accentuation of prosodic and rhythmic elements of speech. Two musical notes are used in phrase production, the higher of the two notes being assigned to the stressed syllables. Modified MIT includes slight variations of these components, such as inclusion of more than two musical notes or exclusion of the tapping element, and is often adapted to the individual receiving therapy.

Method

After the formulation of the research question, search terms and inclusion and exclusion criteria were drafted and reviewed by a music therapist who works with the aphasia population and the professor of a graduate level research methods course. The final search terms were "Melodic Intonation Therapy" OR "Modified Melodic Intonation Therapy" OR "Intonation Therapy" AND "Aphasia", and were used to search the databases PsycInfo, PubMed, and CINAHL. The search terms yielded 85 articles that were then independently screened by the authors for relevance. A total of 16 articles were identified by the authors, 9 of which overlapped, yielding a reliability of 56%. Upon further analysis and discussion, a total of 8 articles were identified as addressing the current research question and were appraised and reviewed. Research that was included focused on speech and language rehabilitation with MIT as the primary intervention and focused on a population of adults with chronic aphasia aged 40 years of age or older.

Results

MIT was found to result in improvements in speech and language measurements in all included studies. Half of the studies (4 of 8) neglected to report individual speech and language measures, including only overall group effects. There was a moderate level of variability between the studies in terms of delivery method, length of therapy, measures of speech and language, and theories for mechanisms of recovery.

Discussion

A majority of the studies included were of adequate or low quality and often included poor methods or poor reporting of methods and results. Several studies included descriptions of what MIT is, but failed to detail how it was executed. Randomization was not reported in the studies that had multiple groups, and all sample sizes were small with 3 of 8 studies focusing on one subject. While all the studies demonstrated some type of improvement in relation to MIT, not all results and comparisons were deemed significant, no effect sizes were reported, and there were varying interpretations of the mechanisms of recovery. Future research with this particular population and treatment should include larger sample sizes, randomization, and control groups when possible.

Conner Haring, Lauren Johnson, Maggie Zenkel
Theory of Mind in Deaf and Hard of Hearing Children: A Systematic Review

Research Question

Do children less than 18 years of age with hearing impairment and no other comorbidities have delayed development of Theory of Mind (ToM) as compared to their typically developing hearing peers?

Purpose

The aims of this study were to (1) conduct a systematic review of quality research of ToM development in children with hearing loss compared to hearing peers in the last decade; (2) identify key differences in ToM of children with hearing loss; (3) analyze results and provide discussion of clinical implications and future investigational aims.

Background

Effective communication requires a level of shared understanding. Jones (2015) observes “an essential element to successful communication is the ability to make inferences about the psychological states of others and to predict or explain their behaviour with reference to their mental states, feelings, beliefs and desires.” Theory of Mind (ToM) is the ability to understand that the mental state of others can differ from our own. Many authors attribute the process of ToM to cognitive-conceptual changes tied to language development that occurs during the preschool years (Milligan, Astington, & Dack, 2007). As a whole, studies have found most typically developing children succeed at ToM tasks by 4-5 years of age (Leverz et al., 2012). However, Leverz et al. report that children with severe-profound hearing loss exhibit a delay of 5-7 years in their ability to grasp beliefs of others. Currently there exists a moderate body of research examining ToM development in hard of hearing children. However, studies differ widely in terms of age of intervention, language abilities, lack of sample homogeneity, and quality of materials used.

Methods

A review of the literature was conducted in three different databases (PubMed, CINAHL, and Web of Science) using the following search strategy: (“theory of mind” OR “theory-of-mind”) AND (child*) AND (develop* OR delay*) AND (“hard of hearing” OR hear* impair* OR deaf*) that yielded 72 results after duplicates were removed. Articles published in the last ten years that compared deaf and hard of hearing children to normal hearing peers under the age of 18 were considered for this systematic review. Only 9 articles met full inclusion criteria, and were appraised by three researchers and given a rating of good quality or lesser quality. After appraisal, 7 articles were further reviewed for the purpose of our research question.

Results

The authors anticipate evidence of delayed ToM development in deaf and hard of hearing children when compared to their normal hearing counterparts. A delay may be due to language delays, lack of “overhearing,” and lack of access to ToM vocabulary thus barring ToM understanding.

Discussion

Should the systematic review support the authors’ anticipated results, professionals who work with children who are deaf and hard of hearing should take into account the impact of delayed theory of mind skills on a child’s social and linguistic development. In the future, interventions could be implemented to keep deaf and hard of hearing children on par with their normal hearing peers in developing theory of mind.

Kim Holden

Challenges in Early Management of Children with ANSD: Analysis of the Timeline from Diagnosis to Intervention

Abstract

It is estimated that 7 to 10% of children with permanent hearing loss have a diagnosis of auditory neuropathy spectrum disorder (ANSD). Due to the unique nature of this disorder, audiologic management of children with ANSD is particularly challenging. This study analyzed the timeline from diagnosis to intervention for a group of children with ANSD followed at UNC Hospitals. Implications for audiologic management are also considered.

Background

ANSD is a disorder characterized by a disruption in the transmission of an auditory signal from the inner ear to the brain. Clinical findings typically include absent or markedly abnormal auditory brainstem responses (ABR) combined with evidence of outer hair cell activity, as demonstrated by present otoacoustic emissions (OAEs) or a present cochlear microphonic (CM). Functional hearing status in children with ANSD is highly variable, with pure tone thresholds ranging from within normal limits to profound hearing loss.

In children with cochlear hearing loss, ABR testing can be used to estimate hearing thresholds and guide audiologic intervention. Due to the lack of neural synchrony along the auditory pathway, ABR testing is not useful in estimating thresholds for children with ANSD. Consequently, audiologic intervention cannot be initiated until hearing sensitivity is assessed with behavioral audiometry. Moreover, co-existing conditions and developmental delays may set back the age at which reliable behavioral testing can be performed in this medically complex population. For the aforementioned reasons, the timeline for diagnosis and intervention in children with ANSD may diverge from the 1-3-6 guidelines recommended by the Joint Committee on Infant Hearing (JCIH).

Methods

A random sample of 40 patients with a diagnosis of bilateral ANSD followed by the Audiology Department at UNC Hospitals was identified. Medical records were reviewed and the following data collected: 1) Gestational age at birth; 2) Age at time of diagnosis of ANSD; 3) Age at time of intervention (e.g. fitting of hearing technology); 4) Number of attempts at behavioral testing between time of diagnosis and intervention.

Results

- Approximately 59% of the sample was born prematurely (<37 weeks).
- The median corrected age of diagnosis for this sample was less than 3 months; the median corrected age of intervention was 10 months.
- The majority of children were able to reliably perform behavioral audiometry after an average of 3 visits. However, some children required as many as 9 visits before reliable behavioral thresholds could be established.

Discussion

The current project supports the need for appropriate counseling of families of children with ANSD to facilitate understanding of the diagnosis, reduce frustration, and provide encouragement to return to the clinic for behavioral testing as needed. Findings also support the need for continued research on the role of cortical evoked potentials and other electrophysiologic tests in the evaluation and management of children with ANSD.

Heather Mazzola, Shauntelle Cannon

Factors that Determine Hearing Aid Adoption and Non Adoption: A Systematic Review

Research Questions

1. What causes older adults with hearing loss to adopt hearing aids?
2. What deters older adults with hearing loss from adopting hearing aids?
3. Who are the main people (clinicians, family, etc) who affect this decision?
4. What further research needs to be completed in this area?

Background

Hearing loss is a significant disability that affects many older adults. About 25% of adults aged 65 to 74 and 50% of adults 75 and older have hearing loss (Yueh et al., 2003). Research has consistently shown that hearing loss causes many problems outside of the communication domain. Hearing loss can cause cognitive, social and emotional problems not limited to depression and social withdrawal. The most common treatment for hearing loss is traditional hearing aids. However, despite the far reaching effects hearing loss can cause, only a small number of adults who are hearing aid candidates actually pursue amplification. This poster attempts to explore the most prevalent reasons adults identify for not treating their hearing loss with hearing aids.

Methods

Articles were identified through systematic searches in PubMed, CINAHL, Web of Science, and a manual search. Studies that investigated the factors associated with uptake, adoption, and/or non-adoption of hearing aids were included.

Results

A total of 10 articles were reviewed. Five overarching factors were identified as affecting the adoption of hearing aids.

Discussion

The main factors identified in this review of the literature that are associated with adoption of hearing aids in adults were: severity of hearing loss, degree of education, socioeconomic status, support from significant others, and cost.

Amy MuneKata, Kevin Yu, Thomas Christensen
The Efficacy of Monolingual and Bilingual Treatment on Bilinguals with Aphasia

Research Question

Which is more effective for bilinguals with aphasia, bilingual or monolingual treatment?

Background

The United States population is becoming more and more bilingual. In 2007, the census bureau reported that about 20 percent of the U.S. population over the age of 5 spoke a language other than English at home. Recently, ASHA reported that only 6% of its members speak a second language well enough to practice bilingually. With such a vast discrepancy between population and service providers, the need for effective bilingual treatment strategies is vast. This paper focuses on the treatments available to the bilingual population with aphasia.

Methods

The present study seeks to understand whether bilingual or monolingual treatment is more effective for bilinguals with aphasia. The study searched 3 databases for articles related to treatment of bilinguals with aphasia. This search yielded 34, 82, and 76 results from CINAHL, PsychInfo, and PubMed, respectively. The abstracts of the articles were reviewed, and articles were excluded if they were more than 10 years old, had only 1 participant, or were written in a language other than English. Twenty-four studies remained. Those studies then were divided among the three authors so that the full text of each article was double reviewed and excluded if any of the previous exclusion criteria were found. Interrater reliability was adequate (70.8%), and this left 8 articles, which were then appraised. Three additional articles were excluded because they were either narrative reviews or did not impose treatment. Data was extracted from the remaining 5 articles.

Results

After appraisal, it was determined that the studies lacked conclusive evidence of treatment effect. Four of the studies examined only monolingual therapy in the participants' L2. The outcomes of L2 therapy were inconsistent. The search yielded no studies that directly compared bilingual therapy to monolingual therapy. The five studies' effects were equivocal, which highlights the need for more high-quality research. Various issues such as the influence of dominant languages, the lack of diversity within studies, and the value of cross-linguistic transfer have been raised for discussion.

Discussion

This systematic review shows a lack of quality research in the field of bilingual aphasia, specially comparing bilingual treatment to monolingual treatment. More research is needed involving larger sample sizes, consistent application of treatment, and inter-study comparable outcomes. The lack of effect sizes leaves clinicians without direction to determine best practices.

Michael Smith

Exploring Narrow Phonetic Transcription Training and Protocol

Purpose or Research Questions

This preliminary research is meant to open the door to comparing training methods for narrow phonetic transcription, particularly evaluating the merits of what we will call "training by experience" and "direct training." Additionally, the transcription protocols will be examined in an attempt to identify more efficient methods of mentally organizing errors. The fundamental goals are to expedite and formalize the process of training and to increase intra- and inter-coder reliability.

Background

There is very little information in the literature regarding the process of training narrow phonetic transcription—the vast majority of references to the data-gathering method note its inherent challenges and the ways in which they might be overcome (transcription by consensus is a typical workaround). In addition, various protocols are used, many of which are not published in full. The use of "unidentifiable error" categories is also problematic, as demonstrated by Haley et al. (2001).

Methods/Proposed Methods

Currently completed work includes the following: comparison of transcription of five motor speech evaluations by the author (MS) and a doctoral candidate at another academic institution, and point-to-point comparisons of transcription of one motor speech evaluation by MS and four undergraduate research assistants. Future work will involve dividing students in an undergraduate phonetics class (UNC SPHS 530) into two groups that will receive one of the two training methods, with comparison of intra- and inter-coder point-to-point agreement.

Results

Initial impressions indicate a desire for extremely high specificity in the second institution transcriptions as compared to those of MS. In particular, there was a tendency to over-evaluate sub-phonemic errors as being phonemic, and many errors were simply not marked in the second institution transcriptions. The point-to-point agreement between the second institution transcriber and MS was zero in almost all files, although the lack of errors in the transcriptions of the former played a notable role in this statistic. The point-to-point agreement between the four undergraduate transcribers and MS was low, but a number of factors might have deflated these statistics—most crucially the limited sample size (one transcription) and the subtlety of distortion errors in the speech of the transcribed speaker.

Discussion

While it is clear that training needs to be refined and experience plays a significant role, the results have in no way disqualified the use of direct training. Given the disparity of distortion rate among the four undergraduate transcribers, incorporating a distortion rate calibration test several times in the training process might improve agreement. In another way, it is also encouraging that agreement was low since that indicates that the four undergraduate transcribers maintained their unique perception as opposed to conforming to that of MS. On a broader scale, demonstrations of the usefulness of narrow transcription could bring about more widespread use of the method. Given recent studies demonstrating the lack of reliability of neurogenic speech disorder diagnosis and the potential merits of establishing sub-phonemic, phonemic and acoustic thresholds in regards to improving this reliability, formalizing the process of training could have a profound effect on diagnosis agreement and resulting treatments.

Emily Spitzer, Heather Porter, Emily Buss

Non-simultaneous Masking of Speech in Noise: Normal-hearing Children and Adults

Purpose

The purpose of this study was to quantify the amount of forward and backward masking children experience as compared to adults for speech, an ecologically valid stimulus.

Background

Previous psychophysical experiments have demonstrated that children have immature temporal processing when compared to adults for forward and backward masking tasks (Buss et al. 2013, Hartley et al. 2000). Forward masking occurs when a noise precedes a signal. Thresholds in this condition are influenced by both peripheral (e.g., “ringing” of the basilar membrane) and central effects (e.g. difficulties differentiating the signal from the masker). Backward masking occurs when a signal precedes a noise. The mechanisms of backward masking are unclear but thought to be entirely central, not peripheral. Children perform poorly in measures of forward masking and even more poorly in measures of backward masking when compared to adults. Previous studies have used unnatural stimuli, typically tones or noise. The current experiment uses speech, a more ecologically valid stimulus.

Methods

Normal hearing listeners ages 5-10 (n=19) and 18-35 (n=20) years participated in the study. Participants heard CVC non-words (McCreery et al., 2011) in between two bursts of speech shaped noise. Stimuli were presented monaurally via headphones and participants were asked to repeat each word. The masker was always presented at 70 dB SPL. Target words were presented for all listeners at a fixed level of -30 dB SPL. In addition, 50% correct performance was estimated for adults using a 1-down, 1-up procedure. These data were used to estimate the signal-to-noise ratio (SNR) required for adults to have child-like performance. Video recordings of each session were phonetically transcribed to analyze error patterns.

Results

Comparisons at a presentation level of -30 dB SNR showed that adults performed better than children overall. For forward masking, children required a signal to be 11.3 dB SPL louder than adults to achieve adult-like performance. For backward masking children required the signal to be 15.8 dB SPL louder than adults. Error patterns are expected to be more variable for children than adults.

Discussion

The present experiment is novel in quantifying the amount of backward masking children experienced for a speech signal. As documented previously for tones in noise, this study found greater non-simultaneous masking in children than adults, particularly for backward masking. This suggests different mechanisms underlie forward and backward masking, which may be subject to different maturational trajectories. These results may help explain why children struggle noisy situations and support the use of classroom or personal assistive listening devices that improve the signal to noise ratio, such as FM systems.

Leah Baumgart, Cally Orme, and Megan Przybyla
Right on Cue: A Systematic Review of Cue-Based Feeding in the NICU

Purpose

The purpose of this systematic review is to evaluate the effect of cue-based feeding on transition to oral feeding for premature infants in the NICU.

Background

Premature infants in a neonatal intensive care unit (NICU) often experience feeding difficulties that prolong their hospital stay. In the past, health care professionals have relied on a preset feeding schedule to facilitate weight gain and improve the health status of infants in the NICU. Transition to full oral feeding is often the last benchmark in determining readiness for hospital discharge (Wellington, 2015). Cue-based feeding, also known as demand or infant-driven feeding, has gained support as a strategy that responds more appropriately to an individual infant's needs (Shaker, 2010). Instead of following a schedule of when and how much to feed an infant, cue-based feeding is guided by the behavioral cues of the infant to encourage acquisition of safe feeding behaviors. Although some studies have indicated the effectiveness of cue-based feeding, the long-standing traditions of NICU culture mean that infant-driven programs have not been widely implemented.

Methods

A systematic search was performed on three databases: CINAHL, PubMed, and Web of Science. Researchers did not time-limit the search. The search was conducted using Medical Subject Heading (MeSH) terms, and several iterations of MeSH terms were trialed before deciding on a final set. The following terms were used: premature infant, NICU, neonatal intensive care unit, low birth weight, cue-based feeding, infant-driven feeding, and scheduled feeding. Studies were included if they were randomized control trials (RCTs) or systematic reviews of RCTs that analyzed the use of cue-based feeding for the premature infant population in the NICU setting. The primary outcome measure of interest was number of days required for the infants to attain full oral feeding or length of hospital stay. Of the 103 articles identified in the search, only 5 articles met these inclusion criteria and were included in the review.

Results

Overall, studies revealed that cue-based feeding resulted in fewer days to oral feeding, shorter length of hospital stay, and negligible effects on weight gain. Though the included studies varied somewhat in quality, the results of the included studies agree that cue-based feeding is generally more effective than scheduled feeding for premature infants in the NICU at reducing length of time to oral feeding.

Discussion

The results of this study suggest that implementation of cue-based feeding in the NICU setting, as opposed to scheduled feedings, can shorten length of hospital stay and lead to reduced health care costs for facilities as well as families. By reducing length of time to oral feeding, cue-based programs can save time for nurses and other health care professionals and facilitate earlier discharge. There is a need for additional studies that include large sample sizes and standardized methods in order to draw more conclusions about the clinical effectiveness of cue-based feeding and encourage its implementation across NICU settings.

Bridget Carlile, Brian Martin

Deep Brain Stimulation: Systematic Review of Parameters for Speech and Swallowing in Patients With Parkinson's Disease

Purpose:

The primary purpose of this systematic literature review was to determine the optimal setting parameters for subthalamic nucleus deep brain stimulation (STN-DBS) in patients with Parkinson's disease (PD) for speech and swallowing. A secondary purpose to the systematic review was to highlight common speech and swallowing problems that may result from STN-DBS.

Background:

Deep brain stimulation (DBS) is a relatively common intervention for individuals with PD used to alleviate tremor and other motor symptoms especially when medication is no longer effective on its own. Insertion of electrodes can occur at multiple sites, with the subthalamic nucleus being a common site. While providing remarkable results in the management of tremor, STN-DBS does not restore prior neurophysiological function and has been associated with unwanted side effects involving speech and swallowing. Solutions to these undesirable axial symptoms include alteration of frequency, amplitude, voltage and pulse width of the electrodes.

Method:

Researchers sought to answer the clinical question, "What are the programming parameters that can be used to optimize speech and swallowing outcomes for patients with Parkinson's after deep brain stimulation of the subthalamic nucleus?" Available literature was reviewed and appraised to summarize what is known about the effects of parameter settings in STN DBS on speech and swallowing, providing evidence-based information about how to modify parameters to enhance communication. Researchers used PubMed to find articles using the search string: deep brain stimulation AND (speech OR swallow* OR dysphagia OR voice OR dysarthria) AND (program* OR setting OR management OR "current shaping" OR frequency OR current OR voltage OR pulse OR amplitude OR electrical parameters) AND Parkinson*

Results:

Results yielded 112 articles related to the search string, 13 were chosen as relevant to the clinical question and were appraised by the researchers. The most prevalent parameter researched was frequency, followed by amplitude/voltage. No studies focused on manipulating pulse width. Other studies found focused on interleaving, and dynamic stimulation change. The current search strategy uncovered varying results of the effects of STN-DBS parameter settings on speech and swallowing. Frequency results indicated lower frequency stimulation correlated with improved speech intelligibility, improved swallowing, improved aerodynamic measures of speech, and subjective speech improvement. Voltage results indicated higher amplitude is associated with decreased speech intelligibility and articulation. Individualized settings such as interleaved and current-shaping stimulation showed both objective and subjective improvements in speech.

Discussion:

STN-DBS has the potential to adversely affect articulation and swallowing characteristics in patients with Parkinson's disease. Lowering frequency, amplitude, and dynamic settings are all proposed solutions for these undesirable axial symptoms. As professionals in the field of speech and swallowing, SLPs should advocate for patients undergoing STN-DBS and be adequately informed to provide the best, evidence based advice.

Nicole Corbin

Spatial Release from Masking: Effects of Simulated Unilateral Hearing Loss

Purpose

Children with unilateral hearing loss (UHL) are at an increased risk for a range of developmental difficulties and delays, but there is substantial variability in outcomes. The overall objective of this research is to determine the factors responsible for these individual differences. The central hypothesis is that reduced spatial hearing skills in children with UHL are responsible for the deficits observed in this population. This study assessed the impact of simulated unilateral hearing loss (simUHL) on children's ability to benefit from spatial separation of target and masker stimuli, an effect referred to as spatial release from masking (SRM).

Background

Listeners with normal binaural hearing use interaural differences, or binaural cues, to segregate and selectively listen to target sounds in multisource environments. This results in SRM, which is an improvement in speech recognition when the target signal and noise are spatially separated. The magnitude of SRM is larger for complex speech maskers than it is for noise maskers. Children with UHL perform more poorly on speech recognition in noise than children with normal binaural hearing. However, few studies have investigated the performance of children with UHL under the conditions in which SRM is greatest. This is a critical void in light of recent data showing that children's performance in a complex speech masker (e.g., two-talker speech) is closely associated with parent report of children's communication challenges, a finding not observed for current clinical speech perception measures (Hillock-Dunn et al. 2015). Furthermore, it has been argued that SRM for complex speech maskers provides insight into factors that contribute to individual differences in masked speech perception (Swaminathan et al. 2015).

Methods

Children and adults with normal hearing completed a sentence recognition task in the presence of a masker that was either two-talker speech or speech-shaped noise. The target speech was always presented from 0° azimuth, and the masker was presented from either 0°, +90°, or -90° azimuth. Testing was completed both with and without a moderate, flat simUHL, created through the use of a foam earplug and supra-aural earmuff. Laterality of simUHL and presentation order of listening conditions were randomized and counterbalanced across participants.

Results

All listeners benefited from spatial separation of target and masker stimuli along the azimuth plane in the no-plug listening conditions. This benefit was larger in two-talker speech than in speech-shaped noise. In the simUHL listening conditions, a positive SRM was observed only when the masker was presented ipsilateral the simUHL (simUHL/msk-ipsi). For the speech-shaped noise, SRM was similar in the no-plug and simUHL/msk-ipsi conditions. For the two-talker speech, SRM in the no-plug condition was larger than in the simUHL/msk-ipsi condition. When the masker was presented contralateral the simUHL, SRM was negative. This pattern of results was observed for both children and adults, although children performed more poorly overall.

Discussion

The present results are in line with previous findings indicating that UHL affects listeners' abilities to obtain a SRM. The differences in results obtained across listeners with simUHL in the presence of two-talker speech relative to speech-shaped noise suggest that the proposed methodology has the potential to provide novel insight into the everyday performance of children with permanent UHL.

Alison Dey, Sarah Plascyk, and Emily Rodgers

A Systematic Review of Treatment Approaches for Childhood Apraxia of Speech

Purpose: The purpose of this systematic review was to investigate the highest quality evidence available concerning the efficacy of different intervention approaches for individuals with childhood apraxia of speech (CAS).

Background: CAS is a pediatric speech sound disorder with a core impairment involving the planning and/or sequencing of speech sound movements, resulting in errors in speech sound production and prosody. There are a number of different approaches to CAS treatment; however, there is a scarcity of research to support these interventions as evidence-based practice. The lack of clear diagnostic criteria and the inconsistent errors seen in CAS have made it challenging to conduct high-quality research studies regarding intervention efficacy. Previous systematic reviews were either inconclusive or identified only a limited number of treatment approaches with sufficient evidence for interim clinical practice while further research is being conducted.

Methods: The systematic review of literature was conducted using eight databases (PsychInfo, Cochrane, CommDisDome, ERIC, Proquest - Nursing and Allied Health, PubMed, CINAHL, EMBASE). We included studies from 2008 to 2015 that pertained to the research question, utilized speech therapy techniques, and measured aspects of speech intelligibility. Case studies and expert opinion articles were excluded. The systematic search yielded 13 articles that were double-appraised by the team members. Appraisal checklists were used to assign individual quality rankings to the studies, and after discussion between members, a consensus was reached regarding overall quality rankings.

Results: The systematic review yielded four good quality SCEDs, four adequate quality SCEDs, two poor quality SCEDs, one 1a quality systematic review, one 1b quality systematic review, and one 2b quality RCT. The majority of studies used motor-based treatment approaches, with a limited number of studies using language-based or a combined motor and language approach. There was tremendous variation in the type of approaches, fidelity of implementation, and duration of treatment.

Discussion: Currently available evidence suggests that certain motor and/or linguistic approaches to treatment may be suitable for interim use in clinical practice pending further research publication, as was also found in the 2014 systematic review. There was only one study that exclusively included a language-based approach, and thus differential efficacy for these different types of approaches could not be determined. However, it is clear that there is a need for additional research studies of high-quality empirical design (e.g.- RCTs) in order to provide SLPs working clinically with the information needed to support evidence-based treatments for CAS.

Sarah Griffin, Ginni Lam, and Alexandra Rodriguez

Effects of Social Interventions on Vocational Outcomes of Adults with Autism: A Systematic Review

Purpose: The purpose of this study was to investigate and systematically review the existing literature concerning the outcomes of interventions containing a social component on post-secondary and vocational outcomes of adults with high functioning autism (HFA) as compared to the absence of such interventions.

Background: About 1 in 68 children is identified with autism spectrum disorder (ASD) according to estimates from CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network. An estimated 50,000 youth with an ASD turn 18 years old each year in the United States (Shattuck et al., 2012). These combined statistics show the necessity for understanding the adult transition process for people with ASD and the development of interventions to facilitate that process. The complex social deficits seen in individuals with autism pose unique concerns for interactions with employers, post-secondary educators, and peers. Supports including a social interaction component are necessary in order to provide educational opportunities and employment, activities that a majority of adults are engaged in for a large amount of their time, for adults with ASD.

Methods: A systematic review of the current literature pertaining to social intervention and vocational outcomes/post-secondary educational success was conducted from February to April, 2016 on four online databases (Academic Search Premier, PsycInfo, CINAHL, and ERIC). Articles were initially considered if they included the search terms, were published between January 2001 and February 2016, and were peer-reviewed. The titles and abstracts of all the searched articles were independently examined based on predetermined inclusion/exclusion criteria, with each article double-examined. Two articles from this systematic search process were determined to be relevant to the vocational outcomes aspect of the clinical question. Three hand-searched items, found through the reference lists of systematically identified articles, were also assessed.

Results: A total of five articles met the inclusion criteria: one randomized control trial (RCT), one systematic review, two retrospective cohort designs, and one single-case experimental design. All five articles were focused on vocational outcomes, with no articles found discussing the effects of interventions with a social component on post-secondary education outcomes. Each article was appraised for quality using standardized checklists by two out of three graduate students, through random assignment. Raters agreed that each study was of lesser quality. Four of the studies examined employment rates after participation in an intervention or vocational support, such as supported employment. All studies showed higher employment rates for transition-aged adults with ASD following their participation in an intervention or support program. There lacked high quality RCT studies to compare interventions that affected the outcomes in question.

Discussion: It is evident that there is a lack of high-quality literature examining the effect of interventions with a social component on post-secondary education and vocational outcomes for transition-aged adults with ASD. Randomized controlled experimental studies should be conducted to assess the outcomes of specific interventions. One intervention focused on employability training (Project SEARCH) shows promising preliminary results in improving vocational success for young adults with HFA. More research concerning vocational and social intervention should be done in order to provide multiple options for young adults with ASD as they approach transition. The development of interventions with a social component that affect post-secondary education outcomes is also needed, as no studies were identified in this review.

Alex Hamel, Taylor Petroski, Katarina Haley
Reliability Improvements for Phonetic Transcription of Lengthening

Purpose

The purpose of this undergraduate independent study was to determine ways to improve the reliability of narrow phonetic transcription of lengthening distortions in AOS. More specifically, we looked for ways to make the narrow transcription of lengthening more accurate and consistent among transcribers.

Background

Apraxia of speech (AOS) is a motor speech disorder with a wide range of characteristics. Analysis of these characteristics has been important in differentiating AOS from aphasia with phonemic paraphasia (APP). These examinations have resulted in an AOS profile described as having a slow speaking rate and noticeable segment/intrasyllabic prolongation. Previous research has considered the reliability of narrow phonetic transcription in coding this error due to it being a prominent symptom in AOS. Results showed low and insignificant intraclass correlation among transcribers (Cunningham et al., 2016). These results were surprising given past reports on excellent reliability for the coding of lengthening (Haley et al., 2012). To improve the reliability and consistency of coding prolongation, training and calibration in narrow phonetic transcription is needed (Cunningham et al., 2016).

Methods

After completing an introductory phonetics course, the first two authors were further trained in using narrow phonetic transcription. During a ten-week period, they coded several motor speech evaluations by speakers with profiles consistent with a diagnosis of aphasia and AOS, using 11 different diacritic marks. The amount of diacritics was reduced from previous transcription protocols to recognize patterns consistent among speakers with AOS and reduce cognitive load for the observers. Each week of training, new diacritics were added to the transcription protocol. Students would transcribe independently and listen to supplemental ear training audio in order to advance their ability to perceive sub-phonemic variation. Weekly meetings were also held to discuss the progress and significance of our findings. Inter-observer transcription reliability for lengthening coding was estimated using point-to-point agreement for segments transcribed ($\frac{\#agreements}{\#agreements+\#disagreements}$). We then reviewed segments with disagreement to identify potential strategies for future transcriber training.

Results and Discussion

The inter-observer agreement improved during eight weeks of training, from 35% before training to 71% after training. The first round of transcribing had higher amounts of lengthening diacritics to the amount found in the final round. During our analysis, we believed that higher amounts of lengthening were found in the first round of transcription for a few reasons. Since we had just been taught the possible presence of this distortion, it was likely that we executed an overuse of this diacritic. Also, our lack of training attributed to these results. Therefore, after using a specific protocol for training, we were able to locate prolongation errors with greater precision and high measures of reliability. We suggest a condensed training protocol with supplemental ear training audio to further develop transcriber's skills with PRAAT or other speech analysis applications. Ear training audio could be beneficial for future research on prolongation to help identify abnormal segment length relative to the speaker's rate of speech. We also suggest supervision and discussion of transcription practices throughout the research process to increase measures of reliability and consistency.

Kim Holden, Dani Warmund, Michelle Hicks

The Role of A1555G in Aminoglycoside-Induced Ototoxicity: A Systematic Review

Purpose or Research Questions:

To evaluate the effect of the A1555G mitochondrial mutation on the risk of hearing loss following aminoglycoside antibiotic exposure.

Background:

Ototoxic hearing loss refers to a decline in hearing sensitivity resulting from drug exposure. Ototoxic medications such as loop diuretics, platinum-based chemotherapy drugs, and aminoglycosides are often used in chronic disease populations and preterm infants, exposing these patients to the risk of hearing loss. This study specifically evaluated exposure to aminoglycosides and the susceptibility of patients with a particular genetic mutation, A1555G. A1555G is a mitochondrial genetic mutation of the 12SrRNA gene involving the single nucleotide substitution of A to G (Gopel et al., 2014). This study sought to analyze if the prevalence of hearing loss following aminoglycoside exposure was higher for patients with the A1555G mutation. If associated with increased risk of ototoxic hearing loss, identification of the A1555G mutation calls for more frequent monitoring and, when possible, reduction in exposure to aminoglycosides.

Methods:

An electronic search of the literature was completed using the following databases: PubMed, CINAHL, and EMBASE. The complete search strategy used was as follows: (deaf* OR hearing loss) AND genetic* AND aminoglycoside*. No language or date restrictions were applied. Selected articles were critically appraised using Cincinnati Children's Hospital LEGEND Appraisal Forms (<http://www.cincinnatichildrens.org/service/j/anderson-center/evidence-basedcare/legend/>).

Results:

Included in this study were 2 systematic reviews, 1 meta-analysis, 5 case reports, 4 cohort studies, 1 case study, and 1 case control study. The majority of studies appraised received a "lesser quality rating." Studies evaluated the prevalence of hearing loss in the presence of the A1555G mutation within various ethnic groups and high risk populations, such as preterm infants and cystic fibrosis patients. Results generally support an increased risk of hearing loss following aminoglycoside exposure in individuals with the A1555G mutation.

Discussion:

While most studies support an increased risk of ototoxic hearing loss with the A1555G mutation, no conclusions can be drawn on effect size. Quantitative data was limited due to variability in study designs and outcome measures. Future studies should include larger samples sizes and implement replicable methodology. Results of the current review support the need for increased monitoring for genetic susceptibility to ototoxic hearing loss in order to prevent and appropriately monitor affected individuals.

Lauren Johnson, Conner Haring, Kimberly Holden, Heather Mazzola, Dani Warmund, Sarah Webster, Marcia Fort, Jackson Roush
Regional Analysis of 1-3-6 Goals in North Carolina

Background

In 2015, the North Carolina Early Hearing Detection & Intervention (NC-EHDI) program underwent major reorganization that increased the number of geographic regions from 6 to 12. Each new region has a single staff member responsible for monitoring EHDI-related activities for children of their area. Though these changes allow for better continuity of care and greater familiarity with regional providers, North Carolina still faces a number of important challenges, among them: delays from screening to diagnosis; loss to follow-up or documentation; and barriers to access of quality pediatric audiology services, especially for families insured by the state Medicaid program. The aims of this project were to: 1) obtain baseline 1-3-6 data and an analysis of strengths and needs for the new regions; 2) use results for strategic planning and quality improvement; and 3) engage graduate students funded by the North Carolina LEND program (Leadership Education in Neurodevelopmental and Related Disabilities) in a project with valuable learning experience and meaningful contribution to the NC-EHDI program.

Methods

Six audiology doctoral students (AuD) at UNC-Chapel Hill funded by the North Carolina LEND program collaborated with NC-EHDI staff to perform a detailed analysis of 1-3-6 (screening by 1 month, diagnosis by 3 months, and intervention by 6 months of age) goals and outcomes across the twelve NC- EHDI regions. The students met with two assigned representatives at the first North Carolina statewide EHDI Stakeholders Meeting in October 2015 where they participated in discussion of EHDI-related issues for program development and collected qualitative regional characteristics, demographics, and perceived strengths and needs. In the following weeks, quantitative 1-3-6 outcome data provided by the Division of Public Health were examined. The most defining qualitative regional strengths, opportunities, and challenges were then selected. The lead author partnered with a graphic designer and formatted infographics for regional quantitative data including: diagnosis, intervention, and hearing aid fitting regional data.

Results

As anticipated, all regions are doing well screening by 1 month old. However, there was distinct variability in diagnosis and intervention goals. On average, only 26.8% of regions completed diagnosis by 3 months. While the statewide average for early intervention by 6 months was 51.3%, only 24% had hearing aid fits by this time. Further analyses are underway to explore the relationship of selected demographic characteristics and regional 1-3-6 outcomes. A number of strengths were common to nearly every region, including expansion of EHDI-related services and increase in the number of hospitals conducting their own outpatient re-screenings. Nine of 12 regions reported barrier to service challenges, citing transportation as a key factor, a problem especially acute for families with children insured through Medicaid. Other challenges were related to middle ear disease management and home birth compliance. A number of opportunities and specific program development suggestions were collected.

Discussion

This study provides the first regional analysis since statewide EHDI reorganization in 2015. These results will be presented at a future EHDI meeting at the Division of Public Health so that they may be incorporated into EHDI goals and objectives to improve the quality and accessibility of services for children who are deaf or hard of hearing and their families.

Heather Mazzola, William Hoole

Special Olympics Healthy Hearing: Outcomes of Referral and Follow-up in Seven Southeastern States

Purpose or Research Questions

- 1) Determine the prevalence of hearing deficiency in individuals with Intellectual Disability (ID)
- 2) Identify the degree and type of hearing loss that most commonly occurs
- 3) Clearly define the barriers to screening follow-up as identified by Special Olympics athletes and clinical directors
- 4) Identify potential solutions to barriers and provide suggestions for future directions

Background

Special Olympics (SO) is a nonprofit organization that works to bring together individuals with intellectual disabilities (ID) from around the world through organized athletic events. For the past 10 years, Special Olympics has offered free health screenings to athletes through their Healthy Athletes Program. It has been well documented throughout the literature that hearing loss occurs at a higher rate in those with intellectual disability (Beange et al. 1999; VanSchrojenstein Lantman-De Valk et al. 2000; Evenhuis et al. 2001). These hearing deficits often go undetected and untreated. Hearing loss that is left untreated has been shown to reduce quality of life and lead to social and psychological deficits. In addition, individuals with ID often experience gaps in medical care. Special Olympics strives to provide medical professionals with information about this special population and encourages their participation.

Methods

Data from seven states (Arkansas, Georgia, Florida, North Carolina, Louisiana, Kentucky, and Virginia) was included in this study from the calendar year 2014. In total, roughly 7500 Special Olympics athletes were included in the study. An overall demographic profile and profiles for each state were compiled. Interviews with clinical directors and athletes were also held.

Results

Strengths of the program include overall athletes screened and the provision of hearing aid vouchers. Challenges the program faces include access to care, need for more clinical directors, and need for streamlined follow up care.

Discussion

A plan for future directions was established. The Special Olympics program could consider using the 1-3-6 approach for follow up guidelines.

- 1) Establish audiological/medical providers within one month post identification
- 2) Evaluation(s) completed within three months
- 3) Audiological treatment implemented within six months post identification if indicate

Morgan McGowan, Jordan Jarrett, and Katarina Haley
Narrow Phonetic Transcription of Voicing Ambiguity in Stroke Survivors

Purpose

The overall objective of this research is to understand voicing ambiguity in stroke survivors with aphasia and coexisting phonemic paraphasia (APP) or apraxia of speech (AOS). In the present study, the objective was to develop an effective method of training to improve reliability of narrow phonetic transcription of voicing ambiguity.

Background

AOS and APP can be distinguished based on the relative frequency of distortion errors in the speech output. Voicing distortion is particularly common. Recently, Cunningham and colleagues (2016) used narrow phonetic transcription and transcriber training that consisted of reviewing IPA symbols, establishing operational definitions of distortions, and practicing the coding of motor speech evaluations. Specifically addressing voicing distortions, they observed an intraclass correlation of 0.63 for stop consonants and 0.57 for fricatives and affricates, which was deemed satisfactory, but also noted that targeted observer training was desirable.

Methods

The authors were trained in narrow phonetic transcription using 11 different diacritic marks. To improve our perception of sub-phonemic variations in voicing, we listened to stop cognates on a voicing continuum, produced words with voicing ambiguity, listened to an experienced transcriber's voicing examples, and collectively crafted an operational definition for when to code for voicing ambiguity. For coding purposes, we used a single diacritic mark to denote both partial voicing and devoicing. Following approximately 40 hours of applying these to speakers with aphasia, AOS, and APP, we completed six hours (4 speech evaluations) of independent transcription and compared our agreement for voicing distortions. Point-to-point agreement was defined as the number of sound segments we agreed upon as having a voicing ambiguity divided by the total number of segments (agreements + disagreements). We discussed coding discrepancies, re-listened jointly to any speech samples that we did not agree on, and either came to a consensus after listening to it twice, or settled on a disagreement and noted potential explanations and remediation strategies.

Results and Discussion

Our initial agreement was 76% for stop consonants, 67% for fricatives and affricates, and 71% overall. The lower agreement on fricatives indicates an area of possible improvement for the training process. Our impression was that adding both fricative production practice and fricative voicing continuum analysis, as we used for stops, would have helped increase agreement for sub-phonemic voicing variations in fricatives. Our agreement in voicing distortion was stronger for word-initial and word-final fricatives than for word-medial fricatives, so we discussed the potential benefit of targeted training for the latter. Finally, we suggest that ongoing reliability calculations could be incorporated in training as a way for transcribers to acknowledge the differences in perception among individuals and to gain confidence in defending sounds they hear as ambiguously voiced.

Conclusions

Our strong listening agreement suggests that the transcription training protocol was effective in identifying voicing ambiguity in stroke survivors with AOS or APP. The training and reliability estimation experiences indicate that targeted exercises and subjective input from transcribers may be used constructively to shape future training methods, so that researchers and clinicians accurately document salient sub-phonemic speech properties.

Jesse Palmer

Cross-Cultural Variation in Objective Measures of Voice: A Systematic Review

Purpose or Research Questions

The purpose of this study was to investigate the vocal norms of people of different races and cultural backgrounds in order to compare them with the generally accepted norms, or those that are typically used in clinical settings. Normative data are often used without regard of what population was sampled and if that accurately represents what would be appropriate for each individual client. Ethically, we as speech pathologists owe it to our patients to use data that pertain to them in order to develop a plan of care tailored to the individual and their specific vocal needs.

Background

When working with patients that present with a voice disorder, one of the first steps clinicians take is to gather acoustic measurements. These measurements are then compared to normative values in order to see which ways the patient's voice may be irregular. This helps inform the speech pathologist as to what therapeutic techniques may be utilized as well as what they report back to the laryngologist. Oftentimes these normative values are accepted without looking into how they were created and of which cultures they represent. This could lead to patients being diagnosed with a voice disorder when their voice is actually appropriate within their community. As a clinician, it is important to use norms that would apply to each client regardless of their background.

Methods/Proposed Methods

A thorough review of the literature was conducted in March 2015, searching four online databases (PubMed, CINAHL, Google Scholar, ComDisDome) using the key words "Voice", "Acoustic", "Norms," "Cultural," and "Race." Articles included reported or synthesized new data, discussed voice rest and/or vocal therapy following surgery or trauma, and were written no earlier than 1997.

Results/Anticipated Results

Although there was a wide range of results, a majority of the included studies found that there was in fact a difference, though not always significant, between the found vocal norms relating to specific cultures and the norms from the literature. However, there is very little literature on this subject and only 10 studies were used. It is also of note that the existing literature is not all high quality. Due to this range in results and quality, it is impossible to say definitively whether more culturally sensitive acoustic norms are required in the treatment of a diverse voice population.

Discussion

This study revealed that there is not just a lack of research into cultural and racial sensitivity in the development of acoustic normative data for the voice, but that there are very few studies looking into voice norms as a whole in recent years. Since these norms inform the course of voice therapy, it is important that more time and money be invested into this area. With more research, we can provide the best care uniformly to all voice patients, regardless of cultural or racial background.

Nicole Steyl, Lauren Owczarzak

Speech-Language Tasks Administered Based on Cortical Location Stimulated During an Awake Craniotomy

Purpose or Research Questions

In an attempt to further SLP knowledge regarding procedures for mapping language during an awake craniotomy, the current systematic review evaluates research on patients with brain pathologies undergoing awake craniotomies to determine if the type of language task influences what area of the brain is disrupted during direct cortical stimulation.

Background. Patients with various types of cortical lesions near critical language areas require highly sensitive surgical procedures to preserve critical language areas. Intraoperative mapping is typically conducted by having the patient produce rote speech and name objects. However, no standardized tests or procedures are used during craniotomies and as a result, speech-language pathologists, neuropsychologists, and other qualified professionals are unsure of the correct language assessments to administer.

Methods

The two authors searched PubMed, Web of Science, and CINAHL databases using a search strategy related to their research question. The search strategy elicited a total of 403 articles, of which the authors conducted a title and abstract review. Of the 403 results, the authors excluded studies irrelevant to their topic of interest which resulted in a remaining 127 articles with an interrater reliability of 94%. The articles were further reviewed to exclude single cases, tasks other than reading, naming, counting, and verb tasks, and non-English studies. One hundred and twenty articles were eliminated due to the exclusion criteria, leaving seven remaining articles. The seven articles were appraised and information was compiled.

Results

Our searches identified a total of seven good-to-lesser quality studies with a total of 103 participants. Four of the studies were case series, two were high quality case controls, and one study was a systematic review. The studies included patients with a variety of cerebral pathologies. Different tasks and varied intraoperative approaches were used. Those analyzing the speech disturbances varied over the studies as well. Different objectives were being tested as well in each study. The good quality studies had multiple observers evaluating speech disruptions and mapped the patients multiple times to increase the validity of the results. Good quality articles also described the statistical analysis process. The good quality studies also had a baseline for each patient to enable comparison of the intraoperative stimulations. Lower quality studies had fewer participants with dissimilar lesions. They also did not discuss statistical outcomes or participant sample size. Lesser quality studies also did not mention reliability or validity of the language mapping.

Discussion

Based on the previous research, we compiled the individual tasks and their respective locations stimulated in the brain. We created a list of general locations, and suggested tasks for those specific locations. It is important to note that due to brain plasticity and variability, these are suggestions and tasks should be individualized to each patient. Future research should focus on developing a more standardized procedure based on the location in the brain being operated on.

Sarah Webster, Lucia Quiñonez Sumner, Jackson Roush
Development of an EHDI Resource Guide for Spanish-Speaking Families in North Carolina

Purpose

To identify barriers and facilitators encountered by Spanish-speaking families when accessing pediatric audiology services in North Carolina. A multi-media resource guide for Spanish-speaking families is being developed to address the unique challenges faced by this population.

Background

Spanish-speaking families in the United States often experience barriers to accessing healthcare that can lead to loss to follow up or delayed diagnosis of hearing loss in children. Barriers to healthcare access for this population include: lack of transportation, language barriers, excessive wait-times to see a health care provider, and lack of health insurance (Flores et al., 1998). According to results from the National Health Interview Survey on Disability (NHIS-D), Hispanic children “experienced greater access barriers and lower rates of utilization [of healthcare] than non-Hispanic children” (Newacheck et al., 2002, p. 253).

Perhaps the most prominent challenge faced by Spanish-speaking families seeking healthcare is the language barrier. Families do not always receive results and recommendations in their first language, or they might receive information through an unqualified interpreter or a child or other family member who speaks English.

North Carolina has one of the fastest growing Hispanic populations in the nation. From 2000 to 2010 the Hispanic population in North Carolina increased from 4.7% of the total population to 8.4% (U.S. Census Bureau, 2000; 2010). Among the over 800,000 Hispanics living in North Carolina, 81% speak a language other than English at home, and 43% are uninsured (Pew Research Center, 2011).

Methods

A Qualtrics survey was sent to six of the largest pediatric audiology centers in North Carolina. It was also distributed to 53 NC EHDI stakeholders that included: speech-language pathologists, teachers of the deaf, *Beginnings* Parent Educators, sensory support professionals, and EHDI regional consultants. Respondents were asked to identify the most significant barriers encountered by Spanish-speaking families in seeking pediatric audiology services as well as the resources they felt would be most useful to include in a resource guide for Spanish-speaking families.

Results

To date, four of the six pediatric audiology centers have returned the survey and 31 of 53 EHDI stakeholders have responded. The most commonly identified barriers to timely audiologic access for Spanish-speaking families included: language barrier/interpreting services, transportation issues, cultural differences, and knowledge about resources. Resources recommended for inclusion in the Resource Guide included: Information about bilingual *Beginnings* parent educators, how to access the EHDI “phone tree” for Spanish-speaking families, a summary of families’ rights under Title VI, a registry of interpreters and how to access them, culturally sensitive information on communication options, a listing of centers that provide hearing aids through Medicaid, and information on schools and programs for children with hearing loss, resources for financial or disability assistance.

Discussion

Based on survey responses combined with the authors’ observations and professional experience, an *EHDI Resource Guide for Spanish-Speaking Families* is being developed to provide information on important topics for families.