

# Meta-Analysis Poster Session



Department of Psychological Sciences

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# Mirna Aboukhzam

## *The Effectiveness of Reading Interventions on Early Literacy of Arabic-Speaking Children*

### **Abstract**

**Purpose:** The purpose of this meta-analysis is to examine the extent to which reading interventions impact the early literacy of Arabic-Speaking children by investigating the following research question: "What is the effectiveness of reading interventions on early literacy in Arabic-speaking children?"

**Method:** In order to find articles relevant to the purpose of this meta-analysis, four electronic databases were searched, and seven studies met the inclusionary criteria. All studies included reading interventions for Arabic-speaking children and measured early literacy as an outcome. An internal and external validity quality markers table was included to determine risks towards validity and reliability. Due to the inclusion of cross-sectional and randomized control trials, Cohen's  $d$  was used to determine effect sizes of the studies.

**Results:** This meta-analysis found that reading interventions have a large and medium effect size on the language and reading comprehension aspects of early literacy, respectively. Language comprehension presents a summary effect size of  $d = 1.44$  and reading comprehension presents a summary effect size of  $d = .58$ . Based on a 95% confidence interval, these two effect sizes are deemed as significant.

**Conclusions:** Reading interventions have a significant effect on the early literacy of Arabic-speaking children. Future research is needed to further refute or support this conclusion.

# Emily Axtell

## *Virtual Reality for the Treatment of Attention in Adults with TBI*

### **Abstract**

**Purpose:** The results of current literature that study the use of virtual reality (VR) technology on restoring components of cognition in adults who have sustained a traumatic brain injury (TBI) are inconclusive. This meta-analysis aims to determine the strength of evidence of the use of VR as a rehabilitation treatment of attention in adults affected by TBI.

**Methods:** A review of previous research was completed utilizing multiple electronic databases (PubMed, Scopus, Web of Science, and PsycINFO), and a hand citation search, to determine articles of relevance. A thorough screening of collected articles was completed to determine the studies deemed eligible for inclusion in this meta-analysis. A total of 1,584 records went through a screening process, with a total of 7 studies meeting inclusion criteria. Included articles were evaluated according to study design, number of participants, mean age of participants, severity of TBI, time postinjury in months, and a measure of attention. VR interventions were evaluated concerning methodology and level of immersion (qualitatively) and the frequency and duration of treatment (quantitatively).

**Results:** The results of this meta-analysis indicate a statistically significant small (Gaeta and Brydges, 2020) Cohen's  $d$  effect size of -0.46 with a 95% confidence interval of [-0.71 to -0.22] indicating an improvement of attention in adults with a TBI using VR technology.

**Conclusions:** The result of this meta-analysis concludes that there is an overall summary effect size of small significance; however, due to variability of findings of the individual studies, as well possible influence of extraneous factors, further research is warranted to determine the efficacy of VR for treatment of attention in adults with TBI.

### **Breakout room 2**

# Isabella Beninate

## *The Effect of a Combined Gestural and Verbal Intervention on Word-Retrieval in Adults with Chronic Post-Stroke Aphasia: A Meta-Analysis*

### Abstract

**Purpose:** Anomia is an impairment in the ability to name common objects. Due to the pervasiveness of anomia in individuals with aphasia, it is critical to identify effective interventions that target word retrieval impairments. The purpose of this meta analysis was to assess whether a combined gestural and verbal intervention is more effective on word retrieval abilities as measured by confrontational naming than verbal interventions alone in adults with chronic post-stroke aphasia.

**Methods:** The following search code was used to retrieve articles from PubMed, CINAHL, PsychInfo, and Web of Science: (aphasia OR anomia) AND (gestur\* OR multimodal\* OR combined) AND (intervention OR therap\* OR treatment OR train\*) AND (retrieval OR naming OR confrontation\* OR word\*). This systematic search identified eight studies that investigated adults with chronic post-stroke aphasia, included a combined gestural and verbal intervention, compared the combined gestural and verbal intervention to a solely verbal intervention, and assessed performance on a confrontational naming task. Effect sizes were calculated for the eight included studies as either Cohen's d or represented as the percentage of nonoverlapping data (PND) depending on the available data.

**Results:** The summary PND effect size for the verbal intervention alone condition is greater than the combined gestural and verbal intervention condition. The summary PND effect sizes also suggest both intervention conditions were effective in improving word retrieval ability. Although the summary Cohen's d effect size for the verbal intervention condition is slightly greater than the combined gestural and verbal intervention condition, the 95% confidence intervals for both conditions include zero indicating that neither had any effect on word retrieval ability. The sole quasi-experimental study that was not included in the summary Cohen's d effect size indicated that there was no significant difference between the two interventions as the confidence interval included zero.

**Conclusion:** The results of this meta-analysis do not support the original hypothesis that a combined gestural and verbal intervention is a superior approach over verbal intervention alone in improving word retrieval abilities in adults with chronic post-stroke aphasia. However, the use of gesture may be appropriate in those most severely impaired as a compensatory strategy to supplement verbal expression during instances of word retrieval difficulty.

### Breakout room 3



# Rana Damra

## *Cross-Linguistic Transfer of Therapy Effects using Semantic Treatment in Patients with Bilingual Aphasia: A Meta-Analysis*

### **Abstract**

**Purpose:** Clinicians should consider language needs for all languages spoken by bilingual patients. An important consideration in language rehabilitation in bilingual speakers is cross-linguistic transfer, or the transfer of treatment gains across all languages used by the person with aphasia even if only one language is targeted. Cross-linguistic transfer creates the potential for improving both languages spoken by the patient while only providing therapy in the language that the clinician knows. The purpose of this meta-analysis is to determine if semantic naming treatment results in cross-linguistic transfer when provided in one of the two languages spoken by bilingual patients.

**Methods:** Four electronic databases were searched to find articles relevant to this meta-analysis. Studies were included for review if (a) participants were adults with bilingual chronic or acute aphasia (b) participants were given semantic naming or semantic feature analysis treatment and (c) researchers measured cross-linguistic transfer to the untreated/untrained language as the outcome measure. Cohen's d was used to calculate effect sizes for some included studies. Due to the inclusion of single-subject and case-study designs, PND was also used to calculate effect sizes.

**Results:** Semantic naming treatment in patients with bilingual aphasia had a large and significant effect on cross-linguistic generalization of therapy effects (as measured using Cohen's d an effect size of 1.59 and 95% confidence interval of 0.81 to 2.37 was reported). For the single-subject and case-study designs, the summary PND effect size of 71% with a confidence interval of 53 to 89 also indicates efficacy of treatment.

**Conclusion:** The results of this meta-analysis support the efficacy of semantic naming treatment facilitating cross-linguistic transfer of therapy effects to the untrained language in patients with bilingual aphasia based on theories of shared semantic networks and lexical processing. However, further research is needed due to multiple limitations including small sample sizes, variability in treatment frequencies, and variability in post-stroke onset.

### **Breakout room 4**

# Leah Frank

## *Voice Intervention and Self-Perceived Improvement: Efficacy of Vocal Function Exercises as Measured by the Voice Handicap Index*

### **Abstract**

**Purpose:** The purpose of this meta-analysis was to evaluate the effectiveness of Vocal Function Exercises (VFEs) for treating voice problems when measured using the voice handicap index.

**Methods:** To gather information regarding the efficacy of VFEs, a systematic review of available literature was conducted using four electronic databases: CINAHL, PubMed, Scopus, and Web of Science. After exclusion criteria, 5 articles were included within this study for analysis. Effect sizes for study outcomes were calculated using Cohen's d.

**Results** The final summary effect size for this meta-analysis was -0.89 with a 95% confidence interval of [-1.06, -0.72].

**Conclusion:** The results of this study indicate that the use of vocal function exercises on populations with voice disorders results in statistically significant improvement in self-reported voice characteristics as measured by the Voice Handicap Index.

# Quiana Hatten

## *Cognitive Behavioral Therapy in Adults and Adolescents who Stutter: A Meta-Analysis of Its Efficacy on Stuttering Anxiety*

### **Abstract**

**Purpose:** Negative stereotypes about stuttering often lead to internalizing bias and create intrusive thoughts within the minds of people who stutter. These negative attitudes can create social anxiety and, in turn, increase stuttering severity when in social situations. Typical stuttering treatments are effective, but they are only meant to address speech output. Cognitive behavioral therapy is a form of psychological treatment developed to target numerous disorders, including anxiety. Available evidence supports that cognitive behavioral therapy is a treatment with different components that confront the other aspects of the multifaceted disorder of stuttering. The purpose of this meta-analysis is to examine the efficacy of cognitive behavioral therapy on adolescents and adults who stutter as it pertains to their stuttering anxiety.

**Methods:** Eight studies, retrieved from four databases were analyzed after undergoing a three-step process of review. A total of 388 results were found. After removing duplicates (163 studies), the remaining studies (225) were screened based on pre-determined inclusion and exclusion criteria. An abstract screening was then conducted before the final full-text screening.

**Results:** The effect sizes for each study were calculated via Cohen's  $d$ , while the magnitude was based on criteria developed by Gaeta and Brydges. Though six studies crossed the line of no effect, this meta-analysis indicated a medium effect size of  $-0.60$ ,  $CI [-0.74 - -0.46]$  for stuttering anxiety, suggesting that cognitive behavioral therapy is an effective treatment for reducing anxiety in people who stutter.

**Conclusions:** The results of this meta-analysis support implementing cognitive behavioral therapy as an intervention for adolescents and adults who stutter. Cognitive behavioral therapy may be useful for reducing social anxiety associated with their stuttering.

### **Breakout room 6**



# Molly Normandin

## *A Meta-Analysis on the Transition Time to Independent Oral Feeding Using OMI with NNS on Neonates in the NICU*

### **Abstract**

**Purpose:** Previous data on the combination of oral motor intervention (OMI) and non-nutritive sucking (NNS) is inconclusive as to whether these interventions used in conjunction shorten the transition time from tube to independent oral feeding in neonates. This meta-analysis considers evidence of existing literature to determine the impact of these interventions combined.

**Methods:** A review of existing literature through existing databases, including PubMed, Web of Science, Academic Search Complete, and CINAHL was completed. Relevant research articles were attained that met the criteria for this meta-analysis. Included articles were analyzed and evaluated based on the study design, intervention and control group size, outcomes measures, participant age, control group intervention, and the use of OMI and NNS in the experimental group.

**Results:** Six studies were included in the statistical analysis. This meta-analysis found an overall statistically significant small effect size on the use of OMI with NNS in shortening the length of time in neonates in the NICU from full gavage to full oral feeding.

**Conclusions:** OMI with NNS had an overall statistically significant effect on shortening the transition time to full oral feeling with neonates in the NICU.

### **Breakout room 7**

# Ean See

## *The Effect of LSVT-LOUD on Vocal Intensity in Discourse for Individuals with Parkinson's Disease: A Meta-Analysis*

### Abstract

**Purpose:** Nearly 90% of individuals with Parkinson's Disease (PD) are affected by motor-speech disorders. Predominantly, decreased vocal intensity creates challenges for patients when interacting with others, which can lead to social withdrawal, anxiety, and decreased quality of life. Lee Silverman Voice Treatment (LSVT) is a behavioral intervention that aims to improve vocal functioning. This meta-analysis analyzes existing literature and determines effect size for the following research question: When delivering in-person, individual treatment for patients with Parkinson's Disease, does LSVT-LOUD improve vocal intensity in discourse after four weeks of treatment?

**Methods:** A systematic review of four databases was conducted. A total of 1,726 results were found. After removing duplicates, the remaining articles were screened based on predetermined inclusion and exclusion criteria. Screening was conducted first by the abstract then by the full text. A final count of 13 articles met the inclusion criteria and are therefore included in this meta-analysis. All studies included the outcome measure of vocal intensity in a discourse task.

**Results** Among the 13 studies, two main discourse tasks were used to measure vocal intensity: spontaneous speech and a monologue. The data obtained in these tasks yielded an overall effect size of  $d = 1.66$ , CI [1.41, 1.91] for vocal intensity in discourse.

**Conclusion:** The findings of this meta-analysis indicate that LSVT-LOUD improves vocal intensity in discourse tasks for individuals with PD.

### Breakout room 8

# Jordan Witts

## *The Effect of Assistive Technology for Cognition on Memory in Adults with Traumatic Brain Injury*

### **Abstract**

**Purpose:** The purpose of this meta-analysis is to examine the effect of assistive technology for cognition (ATC) on memory in adults with traumatic brain injury (TBI) by investigating the following research question: how does the incorporation of ATC as a compensatory strategy in treatment influence memory in adults with TBI?

**Methods:** Four electronic databases were searched to find articles relevant to the purpose of this meta-analysis. After applying exclusionary criteria, five studies met the inclusionary criteria; only four were included as one study did not provide necessary information for effect size calculation. All studies included ATC as an intervention in adults with TBI and measured memory as an outcome. Validity and risk of bias were assessed and included in an internal and external validity quality markers table. Cohen's *d* was used to calculate effect sizes due to the inclusion of experimental, quasi-experimental, and case design studies.

**Results:** This meta-analysis found that the use of ATC as an intervention method has a small effect size of 0.40 on the improvement of memory outcomes for adults with TBI. The 95% confidence interval of -0.37 to 1.14 crosses the line of no effect and is thus found to not be significant.

**Conclusions:** There is not a large enough sample size to conclude that this intervention method is significant. Further research is warranted in investigating the effect of ATC on memory outcomes in adults with TBI.

## Coursework in Evidence-Based Practice

As a requirement for graduation, students in our graduate program in Communication Sciences take a course on evidence-based practice for communication disorders. Evidence-based practice requires careful consideration of external evidence (i.e., research outcomes), clinician expertise, and patient preferences before adopting a diagnostic or treatment approach. To master the art of a search for external evidence, our students complete meta-analyses on diagnostic and treatment procedures for a particular patient population. The result is an incredibly diverse collection of topics, all within the scope of practice of speech-language pathologists. A number of our graduates have published these analyses in *eHearsay*, the peer-reviewed publication of the Ohio Speech-Language-Hearing Association and some have presented their work at the annual convention of the American Speech-Language-Hearing Association.

## Who we are

The Department of Psychological Sciences, Program in Communication Sciences, prepares undergraduate and graduate students to address broad issues of human communication processes and disorders through the application of cutting-edge technology and rigorous clinical training. We provide a comprehensive foundation in normal and disordered human communication and combine it with innovative interdisciplinary experiences that capitalize on the extensive resources of the University and medical community that surround the Department.



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