


Welcome statement: “Hi, it’s a pleasure to be here. I’m Stacey Steel, a Research SLP in Dr. Gerasimos Fergaiotis’ Aphasia Lab at Portland State University.”

The study I’m about to share was recently submitted in a grant proposal to my university, and the project will be completed should I receive funding.

Our project is *Bridging the gap: Measuring perceived barriers and facilitators of a novel anomia assessment tool* by me, Stacey Steel, Rob Cavanaugh, Gerasimos Fergadiotis, and William D. Hula.

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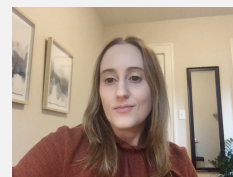


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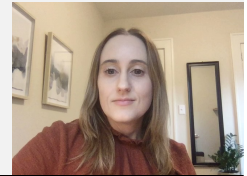
DISCLOSURES



Our financial disclosures are that we receive support from the NIH/NIDCD and/or our place of employment.

BACKGROUND

- Aphasia is an acquired neurogenic language disorder that affects 2.5 – 4 million people in the US (Simmons-Mackie, 2018)
- The primary cause of aphasia is stroke, and 21%–40% of acute stroke patients are diagnosed with anomia by the time they are discharged (Berthier, 2005; Engelter et al., 2006)
- The hallmark feature of aphasia is anomia, or word-finding difficulty (Raymer & Rothi, 2001)
 - Impacts message clarity
 - Can be incredibly frustrating even in mildest cases (Cavanaugh et al., 2020)
- Communication difficulties often persist and impact daily activities, conversation abilities, psychological well-being, and quality of life of those with the condition and their families (Hilari et al., 2015)



Let's start with a bit of background (summarize bullet points)...

These communication challenges and their life-altering impacts drive our research to improve assessment and treatment tools for improved services.

CLINICAL CHALLENGES

- Assessments inform a diagnosis of the impaired psycholinguistic processes underlying anomia, BUT...
- Most available tests are restricted by their psychometric framework: Classical test theory
- Limitations:
 - Norm-referenced scores from standardized tests depend on the particular standardization sample of each test (Embretson, 1996)
 - Z-scores or percentile ranks from different tests cannot be directly compared without assuming equivalent samples



In order for speech-language pathologists (SLPs) to select appropriate and effective treatment protocols, accurate assessments must be completed to make an informed diagnosis of the impaired psycholinguistic processes underlying anomia.

However, there is a central challenge, and that is the lack of theoretically driven and psychometrically robust metrics to support treatment efficacy research and evidence-based practice.

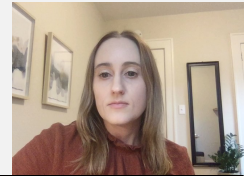
The vast majority of currently available tests are restricted by their psychometric framework within which they have been developed known as classical test theory. Tests developed within this framework are limited in a number of ways.

First, norm-referenced scores from standardized tests depend on the particular standardization sample of each test (Embretson, 1996).

Thus, z-scores or percentile ranks from different tests cannot be directly compared without assuming equivalent samples.

CHALLENGES CONTINUED

- Lack of test comparability:
 - Disrupts the flow of diagnostic information across clinical settings
 - Increases the likelihood that patients are re-evaluated needlessly → increased cost and testing burden
 - Hinders direct comparisons of performance across the care continuum
- Entire test must typically be given to obtain a valid score → increased patient testing burden, fatigue, and frustration
- Tools do not provide scores with an interval status or accurate confidence intervals
 - Critical properties for measuring change as a function of treatment (Embretson & Reise, 2000)

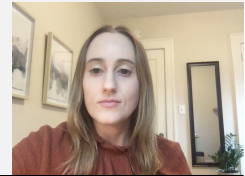


In clinical practice, this lack of test comparability can:

- (i) Disrupt the flow of diagnostic information across clinical settings
- (ii) Increase the likelihood that patients are re-evaluated needlessly depending on the availability of tools at each new setting, which contributes to increased cost and testing burden
- (iii) Hinder direct comparisons of performance across the care continuum
- (iv) Another limitation is that each test must typically be given in its entirety to obtain a valid score, thus contributing to increased patient testing burden, fatigue, and frustration.
- (v) Finally, the tools developed using classical test theory do not provide scores with an interval status, nor do they generate accurate confidence intervals, two properties that are critical for measuring change as a function of treatment (Embretson & Reise, 2000).

SOLUTION

- Item response theory (IRT) is a well-established psychometric framework (de Ayala, 2013; Lord & Novick, 1968) that has strong psychometric properties and can be applied to tools for assessing anomia
- IRT benefits:
 - Supports development of computer-adaptive testing → dynamically selected items tailored to the individual's impairment level
 - Reduced testing length and burden with minimized precision loss
 - Multiple alternate test forms without overlapping items for repeated testing with minimal test-retest effects (Hula et al., 2020)
- Our new IRT-based computerized-adaptive test version of the PNT (PNT-CAT)
 - Results: Reliable, efficient, and accurate (Fergadiotis et al., 2019)
 - NIDCD Grants: 1R01DC018813, 1R03DC014556; PI: Fergadiotis



Item response theory, or IRT, is a well-established psychometric framework (de Ayala, 2013; Lord & Novick, 1968) that can be successfully applied to the development of anomia assessment tools with strong psychometric properties.

Importantly, IRT enables the development of computer-adaptive testing, in which items are selected dynamically during testing and are tailored to the individual's impairment level. As a result, by ignoring uninformative items, testing burden is reduced while precision loss is minimized.

Another advantage of IRT-based tests is multiple alternate test forms are generated without overlapping items. This supports repeated testing with minimal test-retest effects (Hula, Kellough, Fergadiotis, 2015), which is an improvement from most current tests.

For example, an existing anomia assessment with strong psychometric properties is the Philadelphia Naming Test (PNT), but it takes approximately 45 minutes to administer. With support from the NIDCD, we have developed a computerized adaptive test version of the PNT, called the PNT-CAT, and results show it provides essentially equivalent scores to the full test and takes about 8 minutes to administer;

thus, it's a reliable and efficient assessment that reduces administration time while providing accurate information of naming deficits (Hula, Kellough, Fergadiotis, 2015).

The benefits of IRT-based tests underscore their clinical utility and feasibility.

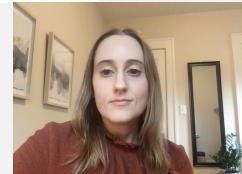
CLINICAL UPTAKE OBSTACLES

- Challenges are multi-level: individual and administrative
- Evidence shows that it can take up to 17 years for research findings to be adopted into practice (Lane-Fall, Curran & Beidas, 2019)
- Facilitating clinical uptake of the PNT-CAT is likely needed because:
 - Less familiar psychometric framework to SLPs
 - Novel platform (i.e., computer-adaptive testing vs traditional static tests)

Know

MIND THE GAP

Do



This bring me to the next challenge.

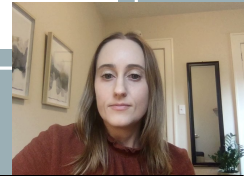
Although innovative tools and evidence-based practices, like the PNT-CAT, are continuously developed to improve healthcare services, multi-level challenges impact their clinical uptake.

Evidence shows that it can take up to 17 years for research findings to be adopted into practice, highlighting the importance of health services research to address this research-to-practice gap (Lane-Fall, Curran & Beidas, 2019).

Since the PNT-CAT utilizes a psychometric framework less familiar to SLPs and it will be administered on a novel platform (i.e., computer-adaptive testing vs traditional static tests), we anticipate clinical uptake of this tool is likely to require additional facilitation with specific attention towards knowledge translation and implementation in clinical practice.

PROPOSED PROJECT AIMS

1. Develop a psychometrically robust survey to examine key barriers and facilitators of the clinical adoption of the PNT-CAT
2. Recruit clinicians to complete the survey measuring relevant constructs and analyze results using mixed methods to identify perceived barriers and facilitators
3. Identify implementation strategies to facilitate the tool's clinical uptake



So, my project will utilize implementation science and stakeholder-engagement to promote the PNT-CAT's clinical adoption.

DON'T READ – SKIP TO NEXT SLIDE NOW FOR DETAILS

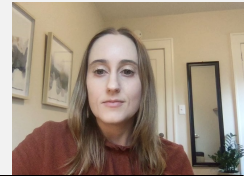
The primary aims are to (i) develop a psychometrically robust survey to examine key barriers and facilitators of the clinical adoption of the PNT-CAT.

(ii) Recruit SLPs to complete the survey measuring relevant constructs and analyze results using mixed methods to identify the perceived barriers and facilitators.

(iii) And finally, identify implementation strategies to facilitate clinical uptake.

FIRST AIM

- Use the Consolidated Framework for Implementation Research (CFIR; REF) to inform key barriers and facilitators of clinical adoption
 - Other relevant theoretical frameworks?
- Identify relevant underlying constructs with published measurement tools (e.g., survey or interview questions, scales, etc.)
 - Anticipated constructs: Acceptability, feasibility, appropriateness, complexity, and cost
- Assess psychometric properties of different measurement tools
 - Focus on questionnaire-based surveys and scales
- Create our survey using optimal items
 - Likely closed- and open-ended questions, scales



The project's first aim is to develop a psychometrically robust survey using the Consolidated Framework for Implementation Research (CFIR; REF) to inform key barriers and facilitators of the adoption of the PNT-CAT in clinical practice.

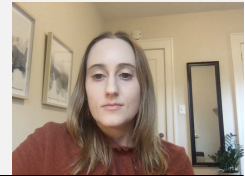
While my chosen framework is commonly used in healthcare outcomes and recently in aphasia interventions, further investigation of the literature will be a crucial step to identify any additionally relevant theoretical frameworks and their underlying constructs with published measurement tools (e.g., survey or interview questions, scales, etc.).

Anticipated constructs of interest include acceptability, feasibility, appropriateness, complexity, and cost.

Dr. Gerasimos Fergadiotis will collaborate to assess the psychometric properties of different measurement tools to be included in our project. This process will support the selection of the most appropriate and optimal items to include in our survey, which will likely contain closed- and open-ended questions as well as scales.

SECOND AIM

- Recruit ~20 practicing SLPs across major healthcare settings in Oregon to complete survey
- Package and share educational IRT and PNT-CAT materials with clinicians
 - Provide a basic understanding of the assessment tool
 - e.g., online tutorial, two-hour training presentation
 - Measure effectiveness via the survey
- Analyze results using mixed methods to identify perceived barriers and facilitators of the PNT-CAT's clinical adoption
 - e.g., descriptive statistics and directed content analysis
 - Use an additional rater



The second aim is to recruit approximately 20 practicing SLPs across major healthcare settings in Oregon and have them complete the survey measuring the relevant constructs that were identified in specific aim one.

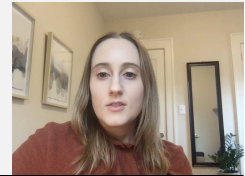
Before surveys are completed, IRT and PNT-CAT materials will be packaged and shared (e.g., online tutorial, two-hour training presentation) to provide the clinicians a basic understanding of the assessment tool, and material effectiveness will be measured by the survey.

Then, results will be analyzed using mixed methods to identify perceived barriers and facilitators of the PNT-CAT's clinical adoption.

Descriptive statistics will be computed to quantify responses and a directed content analysis will be performed to assign open-ended comments to specific constructs within the framework. An additional rater will also review and categorize open-ended comments for reliability.

THIRD AIM

- Based on the findings, choose appropriate implementation strategies
 - e.g., complexity → importance of providing education; which materials were most helpful, needed but missing, or require editing
 - Identify other unforeseen barriers and facilitators and their target strategies
- Include selected strategies as a specific aim in next NIH grant proposal for use in the tool's implementation phase
 - Higher likelihood of successful adoption rates during the PNT-CAT's implementation
 - Measure overall strategy effectiveness in a randomized controlled clinical trial



Lastly, the third aim is to evaluate the findings and choose appropriate implementation strategies that will be included as a specific aim in our next NIH grant proposal for use in the tool's implementation phase.

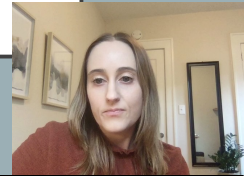
For instance, the construct of complexity may reveal the importance of providing education prior to using the tool in addition to which materials were most helpful, needed but missing, or require editing.

We also anticipate other unforeseen barriers and facilitators will arise and further strategies will need to be identified.

Selection of implementation strategies now in the development/pre-implementation phase will foster a higher likelihood of successful adoption rates during the PNT-CAT's implementation, which will allow resources to then focus on measuring the overall strategy effectiveness in a randomized controlled clinical trial.



THANK YOU!
FEEDBACK IS APPRECIATED



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