

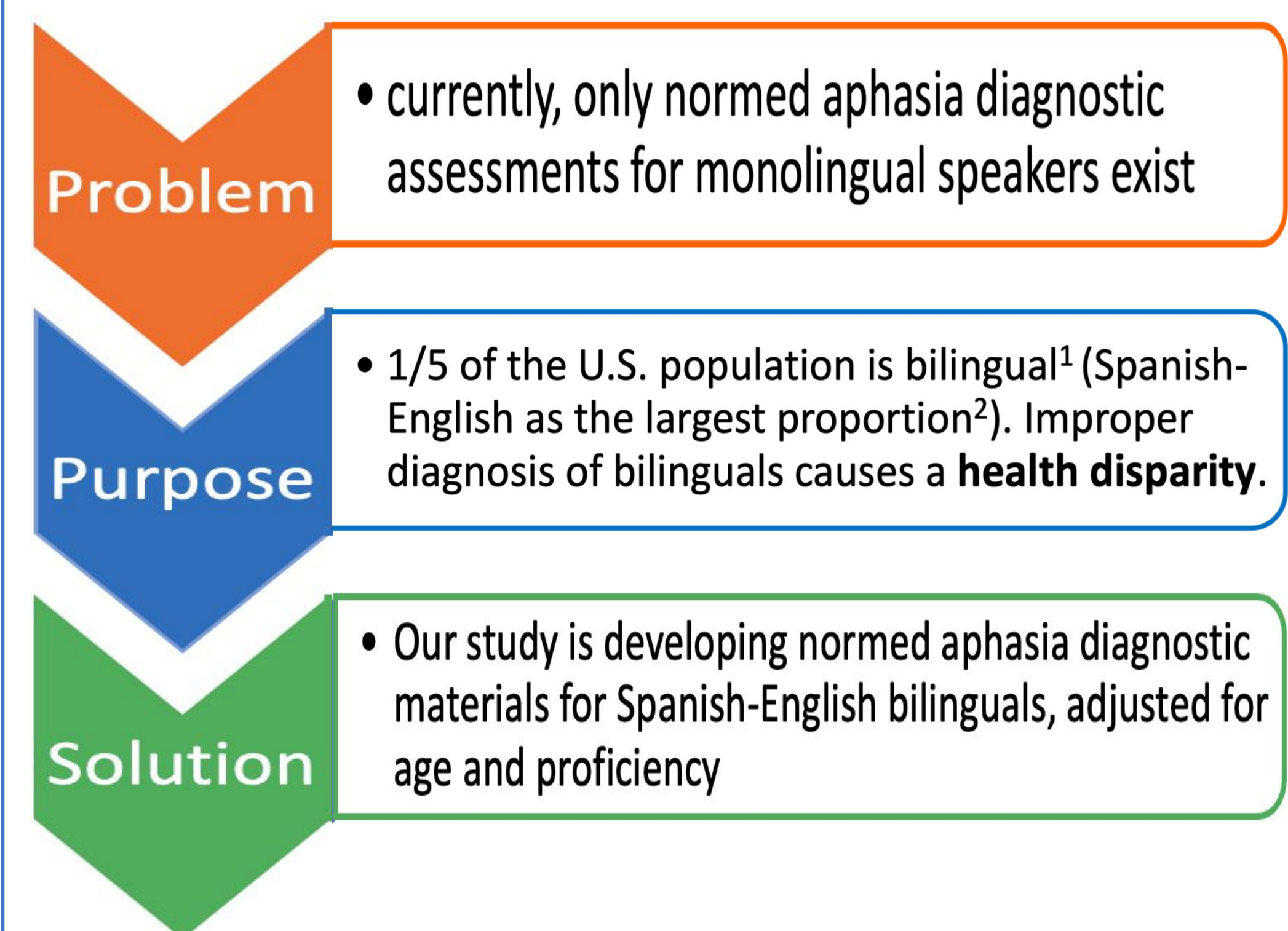
Addressing Health Disparities in Neurorehabilitation: Aphasia Assessment for Spanish-English Bilingual Speakers



BACKGROUND

What is Aphasia?

- Language impairment due to brain injury (stroke or neurodegeneration)
- Causes challenges in understanding and speaking, impacting words (lexico semantics) or grammar (morphosyntax)
- **Accurate diagnosis is essential for effective rehabilitation of aphasia**



AIMS & METHODS

Aim 1: To Detect Aphasia (QAB)

- Modified Quick Aphasia Battery³

Aim 2: To Identify Morphosyntax (MS) Deficits

- Morphosyntax Battery testing grammar abilities

Aim 3: To Identify Lexico semantics (LS) Deficits

- Lexicosemantics Battery word-level abilities

Aim 4: Correlation To Verify QAB

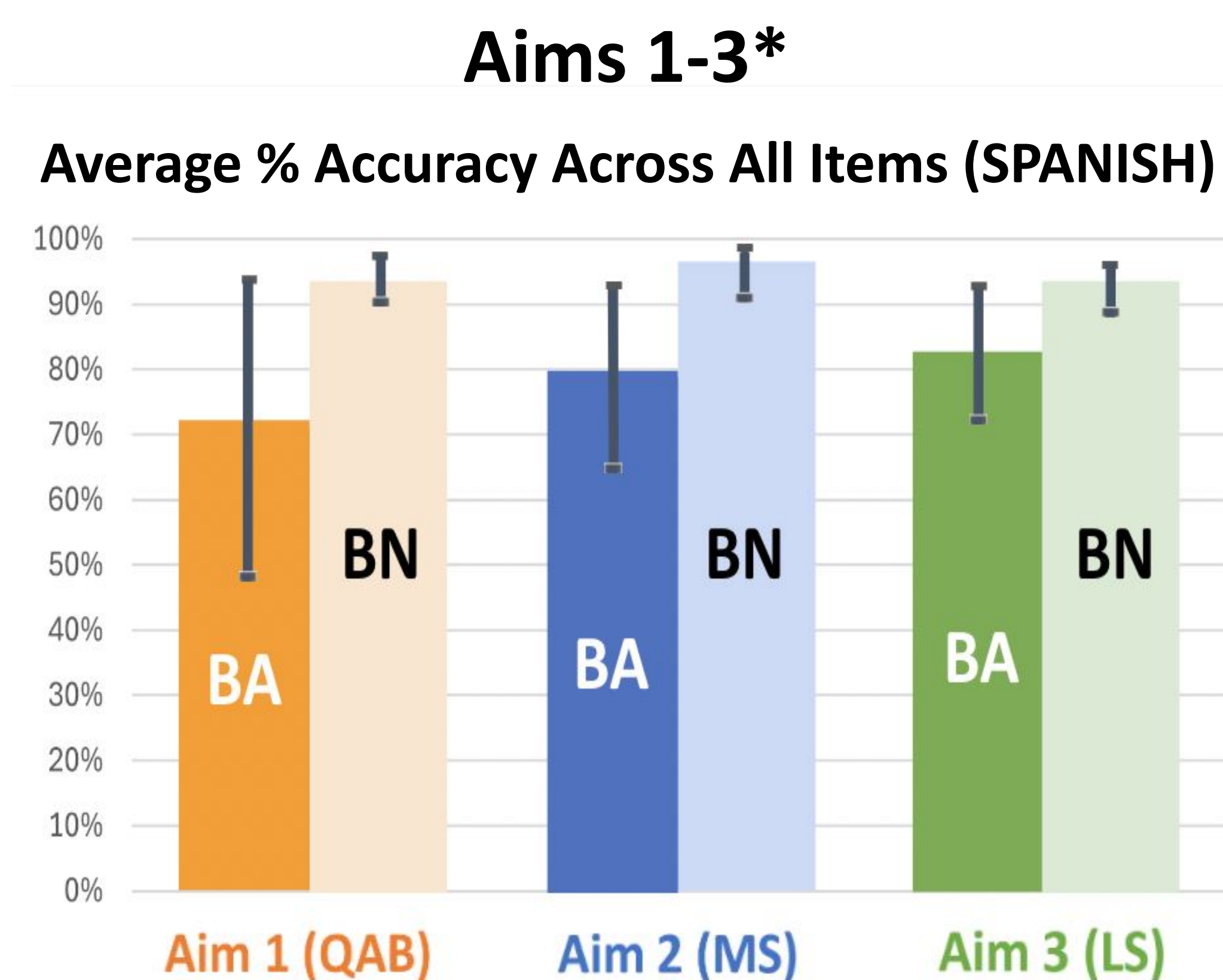
- To determine QAB's ability to flag or identify those at risk for word-level and grammatical level difficulties

PARTICIPANTS

- Tested highly proficient Spanish-English bilingual speakers (30-70 years) with aphasia (BA) and without aphasia (BN) in Spanish and English language tasks over ZOOM, for 4-6 hours

Data for Interim Analysis (age 30-70)			
Bilingual Neurotypical (BN)		Bilingual Aphasia (BA)	
115		18	
Male	Female	Male	Female
27	88	8	10

RESULTS (Interim)



- Displays average % accuracy across **Aim 1**, **Aim 2**, and **Aim 3** for (BN) and (BA) participants in English
- Error bars were calculated using STDEV function in Excel
- A potential cause of overlap in error bars is incompleteness due to withdrawal or inability to do tasks for some aphasic participants

*only Spanish data reported

Aim 4*

Correlation for QAB to LS and MS	
LS Spanish	MS Spanish
0.88	0.73

- For BA participants only:
 - Mean QAB Picture Naming task scores (**Aim 1**) were correlated with mean Lexico semantics (LS) score (**Aim 3**).
 - Mean QAB Connected Speech task scores (**Aim 1**) were correlated with mean Morphosyntax (MS) score (**Aim 2**).
- Mean LS score is the average of scores across all the LS tasks.
- Mean MS score is the average of scores across all the MS tasks.
- To analyze if QAB captures LS and MS deficits in aphasic participants.

References

1. Ryan, C. *Language use in the United States*: 2011. American Community Survey Reports, ACS-22, 2013.
2. Bureau, U.S.C., *The Hispanic Population: 2010 Report Number C2010BR-04*. May 2011.
3. Wilson, S. M., Eriksson, D. K., Schneck, S. M., & Lucanie, J. M. (2018). A quick aphasia battery for efficient, reliable, and multidimensional assessment of language function. *PLoS one*, 13(2), e0192773. <https://doi.org/10.1371/journal.pone.0192773>

CONCLUSION (Preliminary)

- **Average % Accuracy of BN > BA**
- **Aim 1***: The adapted QAB is able to diagnose the presence of aphasia, as shown by the lower scores of BA vs BN in Spanish.
- **Aim 2***: The MS battery is able to identify grammar deficits in aphasia.
 - Examples: “will buying”, “did not tended”
- **Aim 3***: The LS battery is sensitive to word level deficits in aphasia
 - Examples: “fork” vs “fort”. “bark” vs “park”, “knight” vs “rider”
- **Aim 4***: The correlation values (x) are $0.5 < x < 1$, showing a significant relationship between QAB to LS and MS in Spanish.

DISCUSSION

Future Research:

- Determine item difficulty, relationship between language background, proficiency, and performance on test batteries, and influence of cognates
- Establish a computer-based assessment in English and Spanish for bilingual equity
- Test classification accuracy for bilinguals with aphasia

Contact & Acknowledgements

Aphasia Research Center PI: Dr. Yasmeen Faroqi-Shah
Marcia Morales Contreras:

mmorale0@terpmail.umd.edu

Da Yeon Choi: dchoi22@terpmail.umd.edu

Bilingual Assessment Project: bilingual@umd.edu

Website: bilingual.umd.edu

Instagram & Facebook @bilingualumd

