Dear Joint Advisory Board and Members of the Institute for Successful Longevity Committee,

It is an honor to apply for faculty affiliation at the Institute for Successful Longevity (ISL). I am excited to share my research program at Florida State University where I joined the faculty at the School of Communication Science and Disorders (SCSD) this Fall 2024. The SCSD trains clinicians in the field of speech-language pathology across the lifespan, a field in which evidence-based practice is paramount. Consistent with the ISL mission, the Neurobiology of Language and Behavior lab (**NoLaB**), under my direction, focuses on two lines of research: [1] understanding the neurocognitive mechanisms of language decline in people with, or at risk of, neurological syndromes, and [2] the role of language in emotions and other cognitive systems across contexts. To understand the neurobiological mechanisms of language, I study both normal and disordered language processing that results from both focal disorders (i.e., post-stroke aphasia) and neurodegenerative syndromes (i.e., primary progressive aphasia). In an attempt to investigate the gaps in clinical research regarding diversity and disparities–focused research, I have recently developed studies centered on the functional interplay between domains (i.e., language and emotional behavior intersecting in each neurological syndrome) in understudied contexts (e.g., rural settings, under-resourced communities). This line of research is central to understanding neurocognitive diversity in disorders and suggests that both language and behavior may be important areas for intervention. Digital innovations elevate the potential of telepractice, and invention of automated tasks yields quick, non-invasive, remote, scalable, and low-cost cognitive tools to enhance aphasia diagnosis.

I will break down this endeavor into two cardinal themes:

My mobile one-minute rapid naming paradigm (using motion verbs) is part of a large-scale multi-institutional NIH-funded study designed to track cognitive change across patients and asymptomatic persons at risk for frontotemporal dementia syndromes (The ALLFTD study). With my UCSF collaborators, I invented the Smartphone Action Rapid Naming Test, which will allow unbiased patient testing across centers and synthesis of clinical data, crucial for accurate diagnosis and more precise patient care across FTD disorders. Currently, we have gathered

data from more than 100 patients and I am proceeding with UCSF-FSU DUA and analysis - a hierarchical Bayesian item response theory model to quantify word retrieval difficulty based on accuracy and response times during rapid naming.
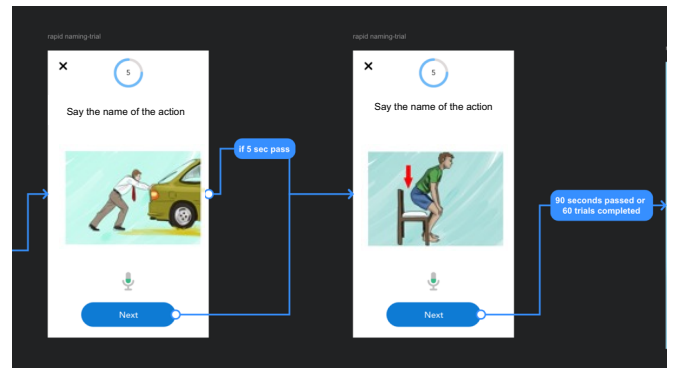
My naturalistic language production assessments of Post-stroke and Primary Progressive Aphasias address the gap that the broader community of patients with neurological syndromes and their families lack easy access to available resources from research and clinical hubs. I aim to bridge this gap by building a natural language database of everyday events (traveling, socializing, eating), particularly in communities that lack the necessary clinical resources and support. This work departs from traditional studies of the neuroscience of language based on a task-oriented method by focusing on patterns of spontaneous language, using Natural Language Processing and brain imaging methods. Our recent study showed that degenerative processes differentially affect speakers' production of morphosyntactic words, and these morphosyntactic deficits correlated with the integrity of the crucial inferior frontal region implicated in syntactic processing (Lukic et al., *2024*). This work serves as pilot data for NIH NIDCD/NIA early investigator applications, with plans to submit it this Fall.

With these lines of investigation, I am developing a multifaceted research program at SCSD that can contribute to a more robust understanding of the neural basis of language and language disorders. A fully integrative approach in both clinical and basic science is necessary to delineate and advance understanding of language (dis)abilities and develop the best holistic (language-behavior) interventions to counter those declines. I firmly believe in an interdisciplinary approach to research in modern science! The most interesting and challenging research lies at the intersection between disciplines, requiring expertise in complementary research approaches. The ISL's dedication to fostering a multidisciplinary approach to aging research, AI, clinical studies, and basic sciences is a testament to this belief.

Thank you for your consideration.

Yours sincerely,
Sladjana Lukic, PhD

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