OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 09/30/2024)

BIOGRAPHICAL SKETCH

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NAME: Kaitlin Lansford

eRA COMMONS USER NAME (credential, e.g., agency login): kllansford

POSITION TITLE: Associate Professor

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of Arizona | B.S. | 05/1999 | Speech and Hearing Sciences |
| Arizona State University | M.S. | 05/2006 | Speech Language Pathology |
| Arizona State University | Ph.D. | 05/2012 | Speech and Hearing Science |

**A. Personal Statement**

I am an Associate Professor at Florida State University (FSU) in the School of Communication Science and Disorders. I am also the director of the Motor Speech Disorders Lab at FSU where we conduct research on dysarthric speech perception. Exploiting the relationship between the degraded acoustic signal and the nature of the listener’s challenge has the potential to be a powerful paradigm for studying intelligibility deficits in dysarthria because results may point directly toward intervention targets, as well as inform theory on the perception of degraded speech. My current work focuses on perceptual training, which offers a promising avenue for improving intelligibility of people with dysarthria by offsetting the communicative burden from the patient on to their primary communication partners. Diseases resulting in dysarthria (e.g., neurodegenerative disease, stroke) often occur later in life. Thus, the older adult population, namely the aging spouses, friends, and caregivers of individuals with dysarthria, would particularly benefit from familiarization. Thus, ongoing projects in my lab center on examining perceptual training outcomes in individuals, 60 years and older. My research team, at FSU and Utah State University, has received NIH-funding (see below) to support this work. Further, we have an R01 proposal under review to extend and expand this research agenda. ***This work aligns with the goals of the Institute of Successful Longevity***. Specifically, this work will establish a *new realm of clinical practice* in which the intelligibility impairments in individuals with neurological disease are addressed by training (often) aging communication partners to better understand dysarthric speech, enhancing communication and participation for this population. Thus, I respectfully request to be considered as an ISL affiliate.

Ongoing projects that I would like to highlight include:

R21 DC018867

Lansford, Borrie (co-PIs)

07/01/20-06/30/23 (no cost extension)

Perceptual training for improved intelligibility of dysarthric speech

Below are selected works conducted by this research team that have advanced perceptual training with dysarthric speech as a viable means for improving intelligibility in dysarthria.

1. Lansford, K.L., Borrie, S.A., Barrett, T. (under review). Cognitive Predictors of Improved Understanding of Speakers with Dysarthria. *Journal of Speech, Language, and Hearing Research.*
2. Borrie, S.A. & **Lansford, K.L.** (2021). A perceptual learning approach for dysarthria remediation: An updated review. *Journal of Speech, Language and Hearing Research*. *64*(8), 3060-3073.
3. Borrie, S.A., Lansford, K.L., & Barrett, T.S. (2021). A Clinical Advantage: Experience informs recognition and adaptation to a novel talker with dysarthria. *Journal of Speech, Language and Hearing Research*. *64*(5), 1503-1514. https://doi.org/10.1044/2021\_JSLHR-20-00663
4. Hirsch, M., Lansford, K.L., Barrett, T.S., & Borrie, S.A. (2021). Generalized learning of dysarthric speech between male and female talkers. *Journal of Speech, Language and Hearing Research, 64*(2), 444-451

**B. Contributions to Science**

**Established the external validity of perceptual training as a listener-based intervention for improving intelligibility of dysarthric speech.**

**Much of the early work demonstrating improved understanding of dysarthric speech following familiarization was conducted** in highly controlled laboratory environments, largely relying on convenience samples of college students**. These studies allowed researchers to build well-controlled models of how the listener understands and adapts to dysarthric speech. Diseases resulting in dysarthria (e.g., neurodegenerative disease, stroke), however, often occur later in life. Thus, the older adult population, namely the aging spouses, friends, and caregivers of individuals with dysarthria, would particularly benefit from familiarization. In a recent study, we found that older listeners, with and without hearing loss, demonstrated comparable gains following perceptual training as younger listeners, suggesting perceptual training is a viable means for improving intelligibility for many age-matched communication partners (Lansford et al., 2018). Additionally, we have demonstrated equivalent gains for perceptual training administered in the home and laboratory settings (Lansford et al., 2016). This finding not only established the ecological validity of perceptual training, but offered an additional, and more convenient, avenue for collecting perceptual learning data (e.g., Borrie et al., 2017). Collectively, results from these studies substantiate the external validity of perceptual training as a viable clinical option for improving intelligibility for people with Parkinson’s disease.**

1. Lansford, K.L., Luhrsen, S., Ingvalson, E., & Borrie, S.A. (2018). Effects of familiarization on intelligibility of dysarthric speech in older adults with and without hearing loss. *American Journal of Speech Language Pathology, 27,* 91-98.
2. Borrie, S.A., Lansford, K.L.,and Barrett, T.S. (2017). Generalized adaptation to dysarthric speech. *Journal of Speech, Language, and Hearing Research, 60*, 3110-3117
3. Lansford, K.L., Borrie, S., Bystricky, L. (2016). Use of crowdsourcing to assess the ecological validity of perceptual training paradigms in dysarthria. *American Journal of Speech-Language Pathology, 25*(2), 233-239.

**Revealed intelligibility improvement following perceptual training is most robust for speakers whose dysarthria is characterized largely by predictable speech degradations**

Robust improvements in intelligibility following perceptual training with dysarthric speech have been revealed for speakers diagnosed with spastic, ataxic, mixed (spastic-flaccid), and hypokinetic dysarthria. In general, these dysarthria subtypes are largely characterized by consistent segmental and suprasegmental degradations (e.g., slow rate, equal and even stress, reduced stress, monotone, monoloudness), offering listeners an adequate level of signal predictability to support perceptual adaptation. Dysarthria, however, is not exclusively characterized by predictable acoustic degradation. Neurological impairments that cause reduced motor stability and/or involuntary movement of the speech mechanism (e.g., Huntington’s disease) often result in inconsistent, and therefore unpredictable, speech degradations, including variable speaking rate, pitch, and loudness, inappropriate silences, and irregular articulatory breakdown. Given the presumed importance of signal predictability to perceptual learning theory, it follows that intelligibility improvement following familiarization with dysarthric speech should be constrained by the constellation of predictable and unpredictable speech features present in the speech signal. In a series of studies, this research team revealed empirical support for this theoretical assumption (Borrie et al., 2018, Lansford et al., 2020, 2019). Collectively, these studies found intelligibility improvement following perceptual training was inhibited for hyperkinetic speakers whose speech was largely characterized by unpredictable degradations.

1. Lansford, K.L., Borrie, S.A., Barrett, T.S., & Flechaus, C. (2020). When additional training isn’t enough: Further evidence that unpredictable speech inhibits adaptation. *Journal of Speech, Language and Hearing Research, 63*(6), 1700-1711.
2. Lansford, K.L.,Borrie, S.A., & Barrett, T.S. (2019). Regularity matters: Unpredictable speech degradation inhibits adaptation to dysarthric speech. *Journal of Speech, Language and Hearing Research, 62*(12), 4282-4290.
3. Borrie, S.A., Lansford, K.L., and Barrett, T.S. (2018). Understanding dysrhythmic speech: When rhythm does not matter and learning does not happen. *Journal of the Acoustical Society of America, 143*(5): EL379–EL385.

**Conducted proof-of-concept work to establish a non-etiology based, theory-driven approach for conceptualizing dysarthria subtypes.**

**Based on previous work exploring speech perception in dysarthria, there is good reason to believe that dysarthric speakers with similar speech characteristics may challenge listeners’ perceptual strategies in specific ways.** However, due to the limitations of established motor speech disorder classification practices, sub-classification alone does not yield appropriate intervention strategies. Consequently, a specific dysarthria diagnosis (e.g., ataxic or spastic dysarthria) does not map well to the resulting *communication disorder*. **Thus, one limb of my research agenda aims to advance an alternative approach to dysarthria characterization; one that posits salient speech features contributing to communication disorders associated with dysarthria may be revealed through the study of perceptual similarity. In this work** (supported by ASHFoundation Speech Science Award and by NIH F31DC010093)**, we examined listeners’ impressions of speaker similarity using a free classification perceptual sorting task. The listeners were instructed to group together speakers with dysarthria according to how similar they sounded and were unaware of the speakers’ underlying medical impairments or dysarthria subtypes. Interestingly, the speakers’ dysarthria subtypes did not guide listeners’ impressions of speaker similarity (Lansford, Liss, and Norton, 2014). In a follow-on study, we found that listeners, irrespective of level of clinical experience, relied on similar perceptual and acoustic features to make their similarity ratings (Lansford, Berisha, and Utianski, 2016). We have also used this approach for categorizing ataxic dysarthria profiles, revealing listeners impressions of similarity align well with established inflexibility vs instability profiles (Spencer, Amaral, & Lansford, under review). This proof-of-concept work has been leveraged by our recent perceptual learning work, in which we used perceptual similarity as a blocking variable for examining generalized adaptation to dysarthric speech. Briefly, we found that listeners, on average, demonstrated generalized adaptation to dysarthric speech following training, and that intelligibility improvement was optimal when the training talker was perceptually similar to the test talker (Borrie, Lansford, and Barrett, 2017a).**

1. Spencer, K., Amaral, J., & Lansford, K.L.(under review). Perceptual Subgroups in Speakers with Ataxic Dysarthria: An Auditory Free-Classification Approach. *Journal of Speech, Language and Hearing Research*
2. Borrie, S.A., Lansford, K.L. and Barrett, T.S. (2017a). Generalized adaptation to dysarthric speech. Journal of Speech, Language, and Hearing Research, 60, 3110-3117.
3. Lansford, K., Berisha, V., & Utianski, R. (2016). Modeling listener perception of speaker similarity in dysarthria. *Journal of the Acoustical Society of America*, *139(6)*, EL209-15.
4. Lansford, K. L., Liss, J. M., & Norton, R. E. (2014). Free classification of perceptually-similar speakers with dysarthria. *Journal of Speech, Language and Hearing Research*, *57*, 2051-2064.

**Explored the construct speech intelligibility in dysarthria through the joint consideration of speaker- and listener-related variables.**

**Stemming from my broader research interests, I actively engage in collaborative research that explores the contributions of speaker-related variables (e.g., speech acoustics) and listener-related variables (e.g., perceptual accuracy, cognitive resources) to overall speech intelligibility of dysarthric speech (see below for a list of select work conducted during my tenure at FSU). The results of these research activities not only further our understanding of how multiple inputs influence speech intelligibility, but also set the stage for future exploration of how these factors might interact with the optimal perceptual training protocol revealed by the current proposal.**

1. Utianski, R. L., Sandoval, S., Berisha, V., Lansford, K. L., & Liss, J. M. (2019). The effects of speech compression algorithms on the intelligibility of two individuals with dysarthric speech. *American Journal of Speech-Language Pathology, 28*, 195–203.
2. Fletcher, A. R., McAuliffe, M., Lansford, K., Sinex, D., & Liss, J. (2017). Predicting intelligibility gains in individuals with dysarthria from baseline speech features. *Journal of Speech, Language, and Hearing Research*, *60*, 3043-3057.
3. Ingvalson, E., Lansford, K., Federova, V., & Fernandez, G. (2017). Receptive vocabulary, cognitive flexibility, and inhibitory control differentially predict older and younger adults' success perceiving speech by Talkers with Dysarthria. *Journal of Speech, Language, and Hearing Research*, *60*, 3632-3641.
4. Lansford, K.L. & Liss, J.M. (2014). Vowel acoustics in dysarthria: Mapping to perception. *Journal of Speech, Language and Hearing Research, 57*, 68-80.

**Examined the perceptual and acoustic outcomes associated with other non-canonical (non-disordered) speech patterns.**

**While my primary research interests focus on perception of and adaptation to dysarthric speech, I have related interests related to perception of other forms on non-canonical speech patterns, including foreign accented, and older adult speech, and speech perception with cochlear implants. This deeper interest in speech perception has led to collaborative research that examined 1) the impact of select listener-related factors on accurate understanding of non-canonical speech; and 2) the impact of normal healthy aging on select acoustic parameters of vowel production.**

1. Ingvalson, E., **Lansford, K.L.**, Federova, V., Fernandez, G. (2017). Cognitive factors as predictors of accented speech perception for younger and older adults. *Journal of the Acoustical Society of America, 141*(6), 4652-4659. doi: 10.1121/1.4986930
2. Ingvalson, E., **Lansford, K.L.,** Federova, V., Fernandez, G. (2017). Listeners' attitudes toward accented talkers uniquely predicts accented speech perception. *Journal of the Acoustical Society of America, 141,* EL234.
3. Fletcher, A.R., McAuliffe, M. J., **Lansford, K.L.,** & Liss, J.M. (2015). The relationship between speech segment duration and vowel centralization in a group of older speakers. *Journal of the Acoustical Society of America, 138*(4), 2132-2139*.*
4. Spitzer, S., Liss, JM, Dorman, M., Spahr, A., & **Lansford, K.** (2009). The use of fundamental frequency for lexical segmentation in cochlear implants. *Journal of the Acoustical Society of America-Express Letters, 125* (6), 236-241.

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