UW ICTR TL1 Postdoctoral Trainee Program
Application Face Page

	Date Submitted/Received:

TITLE OF PROJECT: A multi-measure approach to detect vocal biomarkers of speech impairment in infants at risk for cerebral palsy		
APPLICANT NAME:		
NAME *(Last, first, middle)*: Long, Helen Lauren		DEGREE(S): PhD
POSITION TITLE & DEPARTMENT: T32 Postdoctoral Researcher		CAMPUS MAILING ADDRESS: 1500 Highland Ave, Madison, WI, 53705
TEL: 617-997-6055	FAX: none	E-MAIL ADDRESS: helen.long@wisc.edu
eRA Commons Username: HLONG1		
PROPOSED PERIOD OF SUPPORT: 12 months		
HUMAN SUBJECTS: ☐ No ☒ Yes ☐ N/A		
VERTEBRATE ANIMALS: ☒ No ☐ Yes ☐ N/A		

UW ICTR TL1 Postdoctoral Trainee Program
ABSTRACT Form

Applicant Last Name, Project Title: Long, "A multi-measure approach to detect vocal biomarkers of speech impairment in infants at risk for cerebral palsy"

Abstract (maximum 500 words)**:** ICTR TL1 is a training grant that supports the trainee, without further support for research. However, the research is a critical part of the training plan. Provide a concise description of your proposed research. The abstract must include descriptions of (1) the rationale supporting the proposed research; (2) the specific hypothesis or hypotheses to be tested and the expected results; (3) the research aims and design; and (4) how the project uniquely advances our understanding of the topic being addressed.

Speech motor impairments negatively impact up to 80% of children diagnosed with cerebral palsy (CP), affecting social participation and quality of life throughout the lifespan. Prior work has evidenced the predictive nature of early speech performance on later communication outcomes in CP; however, very little is known about vocal and speech development in this population under 24 months of age. This lack of evidence-based knowledge is a fundamental barrier to accurate clinical diagnosis and prognosis of speech impairments in this population. The proposed research aims to address this gap by examining the predictive nature of perceptual and acoustic measures for speech impairment in infants prospectively identified as being at risk for CP. My central hypothesis is that neurological damage associated with CP will affect the development of the speech motor system, resulting in atypical vocal features in infancy predictive of later speech disorders. The project will utilize an existing longitudinal dataset of parent-infant interaction laboratory recordings of 23 infants at risk for CP around 12 months of age. Infants will be grouped by later-identified speech outcomes (speech motor impairment [SMI] and no speech motor impairment [NSMI]) around 36 months. Specific Aim 1 will compare group-level performance across perceptual and acoustic measures derived from recordings. These will include four perceptual measures of infant syllable categories and three acoustic measures. We hypothesize that children with SMI will have values representative of less well-formed syllable types across perceptual and acoustic measures at 12 months compared to those with NSMI. Specific Aim 2 will quantify the predictive nature of perceptual and acoustic measures on speech outcomes in CP. We will model the best combination of predictors against outcome data. We predict that the quantitative acoustic measures will explain a greater percentage of variance than the subjective perceptual measures. The proposed research has important implications for leveraging vocal biomarkers of speech impairment in CP, as young as infancy. The research and training completed during the project period will 1) provide necessary preliminary data for future grants to develop diagnostic tools for earlier detection of impairment in CP, and 2) refine my skills to conduct highly rigorous translational research as an independent investigator at a research-intensive university.

Project/Performance Site: Primary Location

Organizational Name (department): Waisman Center

Street: 1500 Highland Ave

City: Madison State: WI Zip: 53705

MENTOR(s)/Senior/Key PERSONNEL

Name	eRA Commons Name	Organization	Role on Project
Katherine C. Hustad, PhD, CCC-SLP	kchustad	Waisman Center	Primary Mentor

Other Significant CONTRIBUTORS

Name	Organization	Role on Project
Kate Bunton, PhD, CCC-SLP	University of Arizona	Acoustic analysis consultant
Tristan Mahr, PhD	Waisman Center	Statistical consultant

Questions involving the application or review process should be directed to Lauren Hahn, hahn@wisc.edu.