Getting the Word Out and the Data In: Considerations for Recruiting and Testing Hard-of-Hearing Children for fMRI Research

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Functional magnetic resonance imaging (fMRI) is commonly used in cognitive and neurolinguistic research to measure brain activity by analyzing hemodynamic changes in response to stimuli. Collecting fMRI data for developmental research requires immense preparation and care to be successful, especially in populations with potential additional needs (Davis, Garza, & Church, 2022; Seghier, Fahim, & Hbak, 2019). The “Neuro-Cognition of Literacy for Children who are Deaf or Hard of Hearing” project is a multi-year longitudinal study that aims to investigate phonological and semantic mechanisms for processing written English. Key components of this project include the collection of linguistic and non-linguistic behavioral data as well as fMRI data to provide insight into neurocognitive networks involved in language processing and reading development. For our Demo, we aim to illustrate techniques used by this project to build trust and rapport with children and families from this population from the recruitment process to the collection of fMRI data.

In our Demo, we will first discuss how we have leveraged community outreach to build positive relationships with families before they step foot in the lab. Nearly 30% of our participants learn about the study through either personal correspondence with past participants who had favorable experiences or through outreach efforts. One of the most tangible ways we have built these connections is by showing a regular presence at community events where we use interactive games and displays with relevant themes to initiate conversation with community members and potential participants. For example, a trivia board where children can win prizes or mini computer games that coincide with the fMRI tasks we perform. As part of the session, we will bring examples of our materials that we use at these events and show how we transition from these activities to discussions of the project all while being sensitive to reception from the community we are interacting with. We will also outline how making the effort to connect to the communities being studied plays an instrumental role in combating historical preservations and hesitancy toward research participation.

Next, we will walk through our data collection process with a special focus on the preparation and administration of fMRI scans. This will include a shortened physical demonstration of our protocol in a prerecorded video highlighting aspects that are important to bear in mind when working with hard-of-hearing. Here, we will illustrate how we teach tasks and get participants acclimated to the scanner environment. Some of the considerations that we will showcase include adjustments to existing tasks to eliminate or reduce the need for auditory input, modifications in body positioning and facial cues, additional support options for varying hearing levels (e.g. captioning for instructions), and dealing with discomfort or feelings of anxiety in the scanner. To supplement the video, we will have a poster that underlines key components. We will reflect on specific scenarios that we have encountered and emphasize the importance of an accessible lab environment for participants.

Throughout this Demo, we aim to call attention to how linguistic research can expand its scope, using the current project as a case study to do so. Moreover, we are seeking to show how small changes can make new avenues of research possible. We hope that we can use this

demo period to spark discussion about how cognitive and linguistic outreach is fundamentally connected to shifting perceptions of research by the greater community.

References

Davis, B. R., Garza, A., & Church, J. A. (2022). Key considerations for child and adolescent MRI data collection. Frontiers in neuroimaging, 1, 981947. https://doi.org/10.3389/fnimg.2022.981947

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