



The MARCS Institute for Brain, Behaviour and Development

Summer Scholarship Research Program 2021

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Project 71: Piloting a parent app for speech-language support of Aboriginal and/or Torres Strait Islander children on audiology waitlists

Supervisor(s):

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Project Description

Rates of hearing loss due to otitis media among Aboriginal children are improving but are still at higher levels than for non-Indigenous children and can lead to permanent hearing loss affecting speech and language development. Hearing Australia is a major provider of hearing services: in the last year Hearing Australia worked with 240 communities across a diverse portfolio (metro, regional and remote) conducting 12,000 assessments of 9,000 children. Families often experience a waiting period for services, however; Hearing Australia's project is to develop an app resource to support parents to support their children while they wait, to ensure continuity of care. Hearing Australia recently approached Prof Caroline Jones regarding her ARC CoEDL-funded work on ERLI/OZI-SF checklists (some in collaboration with Hearing Australia and National Acoustic Laboratories) and previous Linkage Grant work with Sunrise Health Service (The LiTTLe Program). A WSU-Hearing Australia collaboration is now being scoped to create an evidence-based digital (app) resource in 2021-22, with a view to a subsequent Linkage Grant application and/or MRFF for further applied research together. Hearing Australia plans to have a draft app ready by end of 2021, so that piloting with end users is a key research activity milestone for summer 2021-22.

Project Aims

The aims of the project are:

1. To write a rapid evidence review (of national and international literature) on effective strategies for parents to support children's speech-language (0-6 years), with relevance to children with speech or language delay and/or hearing loss from socially disadvantaged, Aboriginal and/or multilingual or multicultural backgrounds
2. To pilot the draft tool created (July-Dec 2021) by Hearing Australia, with Aboriginal parents and caregivers (grandparents, kinship carers, extended families) and collect data on their experiences and preferences with the tool (via observation, conversational interviews, and focus groups depending on local contexts)
3. To begin collaboration WSU-Hearing Australia on a grant application to support a program of future applied research work together

Project Methods

The project methods involve:

1. Consultation with Elders and community members, scoping work WSU-Hearing Australia (July 2021 on)
2. Ethics application (July-August 2021)
3. Literature review (July-August 2021)
4. Development of interview schedule / focus group questions (October 2021)
5. (Formal) local cultural orientations for the research team (December 2021)
6. Pilot the app with interviews/focus groups in e.g. Central Coast (December 2021 – Jan 2022)
7. Data analysis and grant writing (January-Feb 2022)

The student will be mentored in reading and discussing the approved ethics application, and then involved just in steps 5-7 above, as an assistant (with regular weekly supervision).

Opportunity for Skill Development

The student will gain in:

- Communication, business and consultation skills (written and spoken, and listening, respectful joint-decision making and negotiation, working cross-culturally)
- IT and research skills (literature review techniques, working with research databases, spreadsheets, multimedia recording, document organisation and version control)
- Knowledge of research and practice in hearing, speech and language development, and awareness of practices, processes and policy in allied health and disability sectors

Students are required to have the following skills/meet the following pre-requisite(s) to apply

As this project focuses on Indigenous children, we plan to advertise it to students who are from Aboriginal and/or Torres Strait Islander backgrounds as an Identified summer internship, and we will publicise the ad through WSU's Badanami Centre for Indigenous Education. The project is particularly suitable for students studying social sciences, humanities, education, or allied health, but is open to students studying any degree.

Project 72: **Uniting Westmead: exploring the perceptions of aged clients and their families**

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Project Description

Dominant models of care for older adults and young children involve separated and institutional care, social care that is separated by client independence level , separated from mainstream health care and community life, and stratified socioeconomically reflecting financial circumstances for family carers, in early childhood, aged care, and housing. Uniting is reimagining these models and keen to research its new integrated aged care and early learning facility at Uniting Westmead. This new build is open and currently accepting its first clients (children, older adults and their families). A collaborative team across Uniting-UTS-WSU has formed, led by Dr Tom McClean at Uniting. The team is currently in the stage of planning and collecting pilot data with a view to large-scale opportunities for research via MRFF, ARC Linkage Grants and other funding opportunities from February 2022.

In this Partnership Summer Scholarship, the student will be involved in the subproject addressing aged care clients from community (e.g. gym), independent living and assisted living. With guidance from Uniting, the student will assist with interviews of new-intake aged care clients, to find out their views on integrated care and what has attracted them to the new Uniting Westmead facility.

Project Aims

The project aims for this Partnership Summer Scholarship are:

1. To map the research literature on models of integrated care, why they work and how they work
2. To capture early perspectives of aged clients (and their families) about Uniting Westmead's integrated care offering and why they have opted in
3. For the research team to begin collaborative working relationships, and experience first-hand the Uniting Westmead facility and meet staff and clients, to deepen understandings of research questions and identify which are key and fundable research priorities

Project Methods

The methods to be adopted are:

1. Consultation and meetings Uniting-UTS-WSU (2020-2021 onwards)
2. Ethics application (July-August 2021)
3. Detailed development of interview schedule (Sept-Oct 2021)
4. Pilot interviews (November 2021)
5. Full interviews (December 2021 – January 2022)
6. Analysis of interviews and reflection on how the data connect with existing research literature (Jan 2022-Feb 2022)

The student will be engaged in a mentoring session after reading the ethics application. The student will be given an orientation to Uniting and the research goals in early December. The student will then join the interviews and data analysis as an assistant (steps 5-6 above).

Opportunity for Skill Development

The student will gain in:

- Communication, business and consultation skills (written and spoken, and listening, respectful joint-decision making and negotiation, working cross-culturally)
- IT and research skills (literature review techniques, working with research databases, spreadsheets, nVivo, multimedia recording, document organisation and version control)
- Knowledge of research and practice in aging and social care, and awareness of practices, processes and policy in aged care and health/disability sectors

Students are required to have the following skills/meet the following pre-requisite(s) to apply

The project is particularly suitable for students studying social sciences, humanities, education, nursing or allied health, but is open to students studying any degree. Students from culturally and linguistically diverse backgrounds are strongly encouraged to apply as Uniting Westmead has a socially and culturally diverse clientele. Students will need to have a current flu vaccination.

Project 73: The role of background music during cross-situational word learning

Supervisor(s): Eline Smit - e.smit@westernsydney.edu.au
Principal Supervisor

Paola Escudero - paola.escudero@westernsydney.edu.au
Second Supervisor

Project Description

The benefits of musical abilities on non-musical cognitive domains, such as linguistic and phonological encoding abilities are well-known. Music training has been found to help develop phonological awareness in 4- to 6-year old children of immigrant families learning a second language, and adults with higher musical abilities are better able to detect lexical tone variation than non-musical adults. It is therefore suggested that having musical abilities may assist in learning words in a novel language. However, most of these studies focus on explicit learning, where participants are told they will be learning new words, which is not demonstrative of real-life learning. Cross-situational word learning tasks are used to test word learning in ambiguous scenarios where participants are not explicitly told the meaning of words but will figure this out through repeated exposures of words and their visual referents. In a recent study, we found that non-musician adults with higher levels of music abilities (measured as sensitivity to pitch changes and the ability to discriminate between melodies) perform differently in a cross-situational word learning task compared to those with lower levels of the tested abilities.

In a recent study, we addressed this gap in research by testing how specific music perception abilities impact performance in a cross-situational word learning study and found that, indeed, sensitivity to aspects of sounds (such as pitch) impacts how people learn new words. The results of this study suggest that participant's musical background influences word learning. We are currently further testing this hypothesis through using words produced with very little pitch variation for which musical training or a specific linguistic background may not influence word learning.

In this project, we explore a different side of the relation between music and cross-situational word learning. Instead of focusing on participant's background, we now focus on the learning environment. Current studies have looked at cross-situational word learning in a unimodal setting, with participants tested in a soundproof lab environment without distractions. However, word learning in daily life occurs in a variety of spaces very different to the lab, often including surrounding sounds and background noise (such as music). To more closely resemble a real-life learning experience, here we will test the influence of background music on cross-situational word learning. Background music has been found to improve concentration in students while performing academic tasks and in the workplace. However, there is no consensus on the influence of background music on word learning. A recent study found that listening to white noise improves word learning in adults, but to our knowledge, no studies have looked at cross-situational word learning in relation to music. We expect that background music has a different impact on word learning compared to white noise, due to music's strong connection with emotions. It has been found that attention and learning are affected by our emotions, hence we expect that strongly positively or negatively valenced music will impact word learning differently. We will conduct a series of online experiments testing the influence of background music that evokes positive or negative emotions on cross-situational word learning.

Participants will be doing a word learning task on an online platform while musical stimuli will be played in the background.

This study is of relevance for education research in the current situation with COVID-19, where an increasing number of children and students are learning outside of their school environment, thereby dealing with more background sounds while learning, such as listening to music. Obtaining a better understanding of how learning experiences are impacted by background music (rather than white noise), and how it may be possible to improve learning by incorporating music, will be beneficial for these students' well-being. As this study will be conducted online, we will be able to test learners in their own environments. By conducting online research, this study will help to inform and train researchers on the new ways of collecting high-impact cognitive and perception research in the current COVID-19 situation, that involve language, arts, telecommunication and music.

Project Aims

This project aims to explore the cross-over between music and language learning and in particular, how music and musical abilities can be beneficial for novel word learning. The results of this research will uncover useful learning strategies that can be applied for educational development.

Project Methods

The student will be shown how to conduct a literature review. The data collection for this research involves online testing using the platforms Zoom, Pavlovia and Qualtrics. The student will be asked to help with this data collection. As the testing takes place online, the student can do this from their home office. The data will then subsequently need to be sorted in Excel. If the student is interested, they will also learn data analysis methods.

Opportunity for Skill Development

The student will gain insight into scientific methods and experimental design. The student will be able to experience a research project from beginning until the interpretation of the results and will be involved in all the in-between steps. This includes learning to conduct a literature review, data collection, and data analysis.

Students are required to have the following skills/meet the following pre-requisite(s) to apply

There are no specific skills required for the student, but experience with psycholinguistic research is desirable. The computer software involved in the project can be learned easily.

Project 74: Little Multilingual Minds: a language learning program to foster multilingualism in early childhood education

Supervisor(s): Paola Escudero - paola.escudero@westernsydney.edu.au
Principal Supervisor

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Second Supervisor

This project is in partnership with **Amiggos Bilingual Long Daycare and Preschool LTD**

Project Description

About 30% of Australians have a home language (HL) other than English. Despite much research and advocacy by world organisations (such as UNESCO) on the benefits of multilingualism, many migrant families do not pass on their HL to their children. This is mostly due to fears of delayed language development, low English proficiency, low academic performance, the child developing an accent, and linguistic discrimination.

However, recent studies have shown that HL use outside the home in early childhood has several positive effects including maintaining the HL, preventing early language shift to the dominant language and for the development of children's language and literacy skills. It is therefore important for children to be spoken to in their parents' HL as this is beneficial for children's development in general.

Little Multilingual Minds (LMM) is a language learning program designed to promote multilingualism in early childhood settings. The language learning program consists of four key elements. First, the learning sessions are conducted at the partner's location. Second, the program is delivered by a facilitator from the partner's network of native speakers of the HL. Third, learning is play-based, including singing, performing and telling stories within meaningful themes and carefully crafted activities. Fourth, the approach is tailor-made to each partner with a focus on individual learning.

Children participate in a series of tasks specifically designed for the LMM program. Not only due to the COVID-19 pandemic but because of ease of delivery at the comfort of children's homes and involving parents as facilitators, the tasks are all administered online. For our first partner, a bilingual early learning childhood setting in Sydney, the LMM program was tailor-made to enhance HL skills to promote the use of this language in formal learning setting, leading to bi-literacy and equal levels of school readiness for both of the children's languages. Children were tested before and after attending the LMM program on a series of linguistic and cognitive proficiency tasks, including an eBook learning paradigm, auditory and phonological memory tasks, verbal fluency, receptive vocabulary and sequential memory tasks. Pre-LMM testing took place twice, three months apart, with the aim of examining their natural longitudinal development of linguistic and cognitive abilities in their two languages. The post LMM testing took place three months after program commencement. We also compared children who participate in the LMM program to a control group from the MARCS Baby Lab participant pool who do not participate in the LMM program with the aim of demonstrating how bilingual children's development compares to that of monolingual peers in

each language. Finally, the comparison of abilities pre and post LMM sessions will demonstrate whether the program can successfully enhance HL skills.

Project Aims

As detailed above, the overall aim of the Little Multilingual Minds project is to promote multilingualism in early childhood settings. We have developed a language learning program for early childhood settings that supports bilingual education in Australia, focusing on early literacy and numeracy skills in the heritage language and English. The LMM program operates in close collaboration with early childhood settings, such as day care centres, preschools, playgroups or primary schools. We have conducted pre and post LMM testing at our first early learning partner, a bilingual preschool in Sydney. We have analysed the first testing time of the collected data and have established the required analysis techniques and procedures that will now need to be applied for the longitudinal data collected pre and post the delivery of the LMM sessions. Additionally, the LMM program started at our first partners started in May this year and we will have data for two post-LMM testing sessions (testing scheduled for August and November 2021).

Project Methods

The student will help with analysing the second round of testing (which took place 3 months after the first round and prior to the delivery of the LMM session). If the student is interested and time allows, LMM sessions (consisting of video recordings) can also be analysed using video coding techniques. The student will help with coding and analysing these video recordings using a program called ELAN. Prior to starting with analysis, the student will be involved in helping with online testing of the second testing time post LMM program delivery (November 2021), which involves knowledge of each test within the test battery and how to administer each task using our online protocol. The student will gain full understanding of how the data is collected, including help with data collection, prior to starting with analysis.

Analysing the data involves pre-processing and excel data sheets for results of nearly 80 children tested throughout the project. Depending on the student's interest and abilities, data analysis can involve learning of statistical modelling techniques. With video coding, the student will also gain insight and abilities in linguistic input and output analysis from the educator and the children participating in the sessions for further linguistic analysis of different parts of speech.

Opportunity for Skill Development

The student will gain insight into scientific methods and data analysis. The student will be able experience a research project from different angles, such as how to process the data and how to analyse the data.

Students are required to have the following skills/meet the following pre-requisite(s) to apply

There are no specific skills required for the student, but experience with psycholinguistic research is desirable. Ability to use excel sheets for data analysis is also desirable. The computer software for analysis videos and for statistical analysis can be learned easily.