SSHRC Discovery Insight Award Summary for Dr. L. L. Emberson

The neural correlates of an infants' first-person experiences (e.g., hearing speech, exploring objects) have long been studied but often with infants' as passive recipients of simple stimuli presented on a screen and outside their native socio-cultural context. Infants' first-person experiences are crucial to early cognitive and neural development outcomes. These experiences are inherently interactive with parents and strongly shaped by the socio-cultural environment. Infants actively engage in these experiences to learn; for these experiences to translate into the most robust learning, they need to be live. And yet, there is a gulf between the nature of infants' experiences and how they are commonly studied. The majority of research uses standardized experimental protocols, discouraging parents from any interaction. In addition, this experimental mediation places infants in the predominantly Western academic setting, posing a substantial cultural shift for some infants but a minimal cultural shift for others. While these reductionist approaches have allowed considerable progress, we propose that the field is sufficiently advanced to evaluate whether these methods are required to study infant experiences, or whether a new experimental approach could yield a great deal.

In an effort to bring about a more ecologically-valid and culturally-specific study of infant first-person experiences, we propose to investigate infants in a naturalistic experimental design. First, in Study 1, parents will engage in a period of free play with their infants in a lab setting while we record infants' brain activity using functional near-infrared spectroscopy (fNIRS). Then, we will engage in a year-long period of community engagement to build relationships with key communities historically not represented in in-lab psychological studies but that have large communities in the Vancouver suburbs. Finally, in Study 2, we will move the fNIRS study from the lab into participants' homes and record parents in free play with their infants in their home environments.

This proposed project is a large leap forward in the field in multiple ways: embodying more inclusive recruitment practices and criteria, leveraging the latest neuroimaging technology and analytic techniques in our highly skilled team, and using an experimental design which allows a largely unencumbered and active infant experience while they are engaging with their parents in a culturally-appropriate manner. With these advances, our findings will reflect the diversity of infant experience in Canada while minimizing spurious differences arising from the culture of academia.

This proposal represents a significant advancement in the ecological-validity and complexity of findings from infant fNIRS studies culminating in the creation of highly multidimensional and diverse datasets (shared openly with researchers). Overall, we anticipate strong interest from the research community in our findings (presented at international conferences and in top journals). Findings from this project will allow the field to evaluate the need for highly-restricted experimental designs and incorporate the scientific benefits of this more diverse and inclusive approach to developmental cognitive neuroscience. The project will support the training of undergraduate and graduate students, producing highly skilled and sought-after employees. Additionally, by extending our current community engagement, the proposed research will deepen our appreciation of investigating infant experiences within their socio-cultural contexts and shift the process of knowledge translation to bidirectional mobilization, actively engaging with the priorities and interests of families from historically under-represented communities.