

Ethics, What Ethics?

Developing a Wearable Brain-Computer App for Vulnerable Children in Nepal and Canada

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CONFLICT OF INTEREST

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Questions for Discussion

1. What are the challenges when applying models and therapies for improving mental health from our culture to other cultures?
1. How do we know that children benefit from participating in our research?
2. How do we find a balance between conducting rigorous research and ensuring that our research does not harm the children we work with?
3. What are our obligations post-project as researchers? What, if any, legacy do we leave behind for the children and their community?

It begins in Nepal



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Nepal House Society School (Pokhara, Nepal) Young girls with trauma that impacts schooling

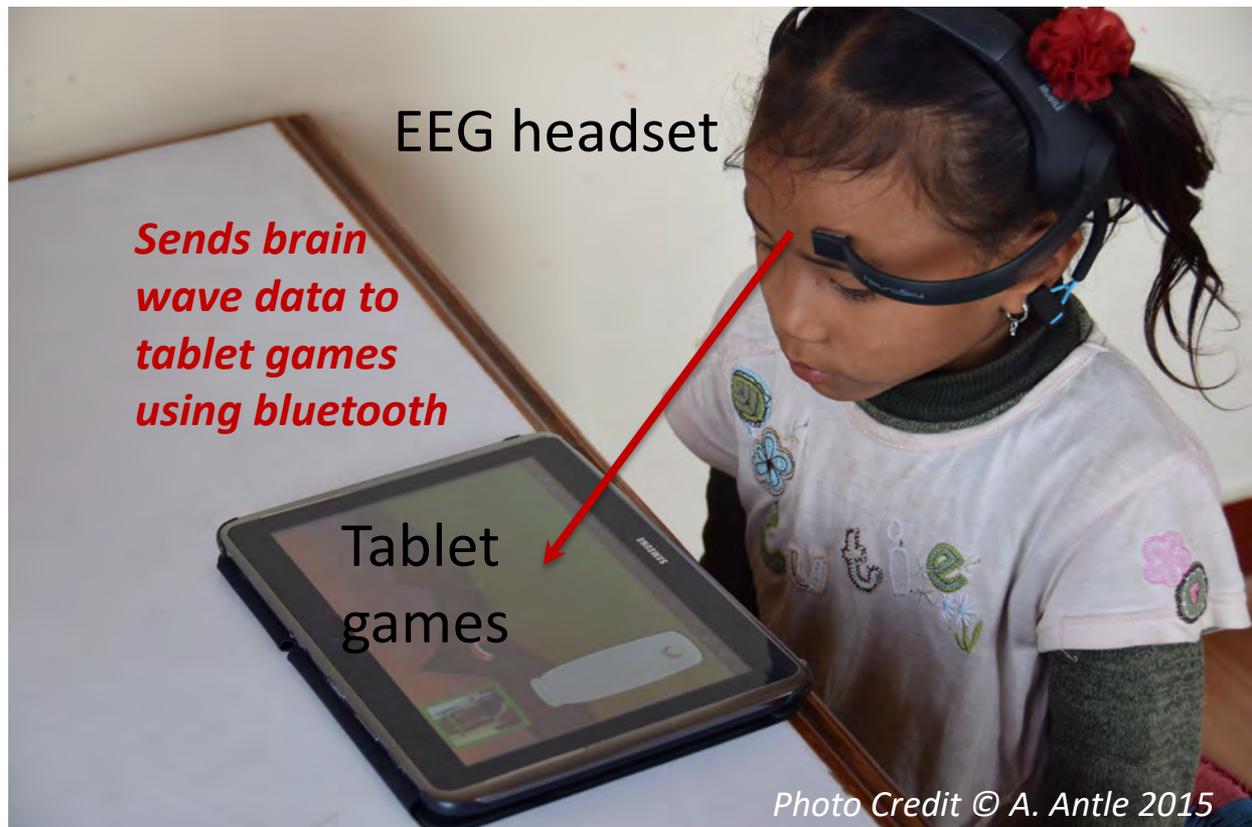


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Wearable Brain Computer System

1. Wearable: EEG (brain) headset
2. Computer: Android tablet
3. Connectivity: Bluetooth
4. Application: Neurofeedback games designed to teach self-regulation of anxiety and attention

Wearable Brain Computer System

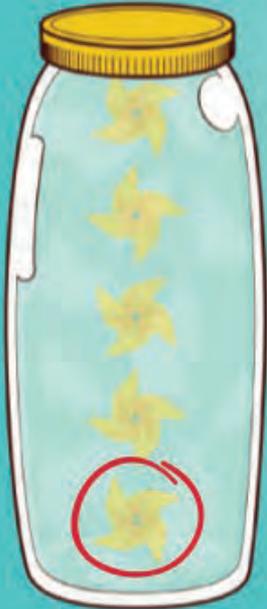


Mind-Full Neurofeedback Games



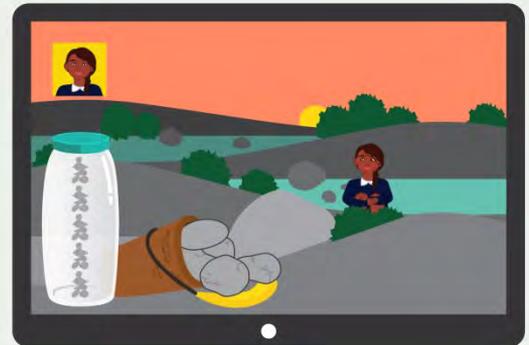
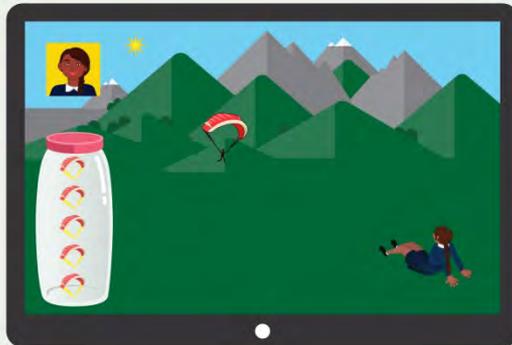
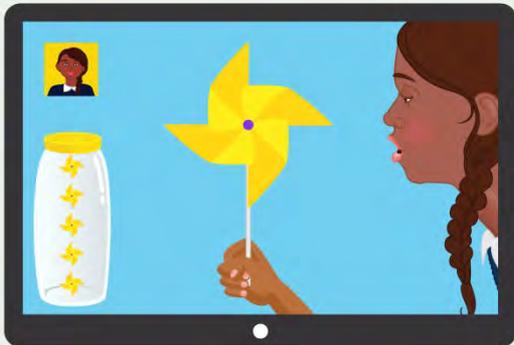
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PINWHEEL GAME



PARAGLIDER GAME





Research Question

Is a mobile wearable neurofeedback app viable and effective at helping children improve their ability to self-regulate anxiety and attention?

Field Study: Nepal House Kaski School (Pokhara, Nepal)



Photo Credit © A. Antle 2015

Field Study: Lower Socio-Economic Status Schools (Vancouver Metro, Canada)



Photo Credit © N. Johnston 2017

Field Study Results

Most children made significant gains in their ability to self-regulate both anxiety and attention at school and home (Canada, only), which were maintained at 2 month follow-up.

Antle, A.N., Chesick, L., Sridharan, S.K. and Cramer, E. 2018. East meets west: Can a mobile brain-computer interface help children living in poverty? *Personal and Ubiquitous Computing* 22(4), 839-866.

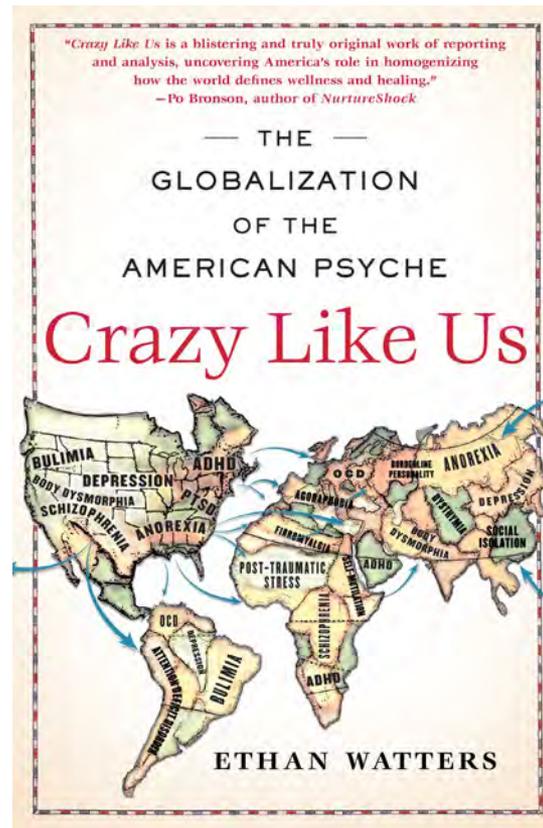
Antle, A.N., McLaren, E.S., Fiedler H. and Johnston, N. 2019. Evaluating the impact of a mobile neurofeedback app for young children at school and home. In *Proceedings of Conference on Human Factors in Computing Systems (CHI '19)* ACM Press, in press.

Ethics, What Ethics?

Question 1.

What are the challenges when applying models and therapies for improving mental health from our culture to other cultures?

Exporting models of mental health



How to ensure we work within cultural norms?



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Western and local therapists and research team conducting extensive site visits



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Working with multi-cultural stakeholders to define mental health goals



Photo Credit © A. Antle 2015

Developing shared language for assessment based on culturally-sensitive goals



Question 2.

How do we know that children benefit from participating in our research?

Contextualizing children's exposure to research and technology as a contribution



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Providing children's counsellors with (real time) data may help them understand and determine benefits



Working closely with children and caregivers to identify and mitigate risk in real time



Being asked to come back ...



Question 3.

How do we find a balance between conducting rigorous research and ensuring that our research does not harm the children we work with?

Using a waitlist control group design is one way to balance rigour and benefit



Putting individual care and flexible treatment
before rigour as needed



Using mixed methodologies to adapt data analysis to the realities of study deployment



Questions 4.

What are our post-project obligations as researchers and what, if any, legacy do we leave behind for the children and their community?

Building capacity with counselling team in Pokhara



Photo Credit: © L. Chesick 2015

Enabling technology transfer to staff in Pokhara



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Asking Nepali team about legacy ... and what future things we might do to support them



Thank you

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TEDx Talk
Why Self-Regulation Is More Important Than Literacy

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