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[Post-Doctoral Fellow](#)

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Bio / Areas of interests below

BIO:

I graduated from the University at Buffalo in 2021 with my PhD in the Learning Sciences. I am currently a postdoctoral researcher in the Department of Psychology at the University of Chicago. I work in both the Goldin-Meadow Lab and Environmental Neuroscience Lab under the supervision of [Susan Goldin-Meadow](#) and [Marc Berman](#), respectively. Broadly, I am interested in collaborating with educational practitioners to make connections from neuroscience and psychology-based research to comprehensive and transformational teaching practices. Specifically, my research involves using neuroimaging to understand the benefits of using gesture during math instruction. Furthermore, I am interested in working with instructors to implement gesture-based teaching strategies into their lesson plans.

ONGOING PROJECTS RELEVANT TO CMBC WORKSHOP:

(1) The neurological mechanisms underlying gesture-based instruction

My colleagues and I are using functional near-infrared spectroscopy (fNIRS) to investigate the neurological underpinnings of 8-10-year-old children learning math equivalence problems (e.g., $5 + 4 + 3 = __ + 3$) through either gesture- or action-based instruction. We predict that gesture-based instruction will activate brain areas associated with relational reasoning and will be positively associated with solving problems requiring retention and transfer. The outcome of this work may help further justify the use of gesture in math instruction and can inform design decisions in the partnership outlined below.

(2) Testing the impact of gesture in an authentic learning environment

I am currently in the process of launching a collaboration with Chicago Public Schools (CPS). Most research that could be applied to education isn't actually that useful for teachers or is misinterpreted in unhelpful ways. I want to create a

partnership where teachers are active participants in research that is mutually beneficial for them and their students as well as the larger scientific community. My work focuses on practical, easy-to-use teaching methods that have been shown to enhance learning outcomes. Specifically, I study how using gestures can improve math learning. Most of the work in this area has been completed in a laboratory environment, but I am interested in testing the effects of gesture in real classrooms.

A unique aspect of my work is that I use a portable, non-invasive neuroimaging device called functional near-infrared spectroscopy (fNIRS). With this tool I am able to gather neurological information from children when they are learning math through gesture-based instruction. This technique allows us to validate claims about the effectiveness of gesture. While children wear the fNIRS cap, they can move around freely and engage in authentic learning tasks. Using fNIRS while testing the role of gesture in a classroom setting may help researchers make direct, applicable, useful connections to instructional practice.

I am in the process of establishing a partnership with CPS students and teachers who are interested in participating in this research, learning about fNIRS, the brain, and the role of gesture in teaching and learning math.



Functional near-infrared spectroscopy (fNIRS)

POSSIBLE AREAS FOR COLLABORATION:

I am particularly interested in gaining a better understanding of how embodiment impacts teaching and learning outside of laboratory environments. For the journal issue, I will be writing a review on what we know about the benefits of gesture when implemented into math curricula.

| feedback |

[participants are invited to leave your **name** with your **feedback below**]