

Determinants of future cognitive development: A motor training study

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Motivation

- Do motor skills predict children's ability to learn about the world?
- Can we use simple motor training to promote healthy development?

Project Description

- Parents will play games with their three-month-old babies designed to encourage the onset of independent grasping.
- The long-term effects of the games will be assessed at 10 and 16 months (see Figure 1).
 - Measuring cognitive skills with tasks tapping into executive functioning and tool use behaviors.
- Study team members:
 - Klaus Libertus (PI), Darcy Smith (graduate student), and Ran An (lab coordinator), as well as one Pitt undergraduate student (TBD).

Longitudinal training study aiming to identify how motor experiences during infancy influence emerging cognitive abilities predictive of school readiness.

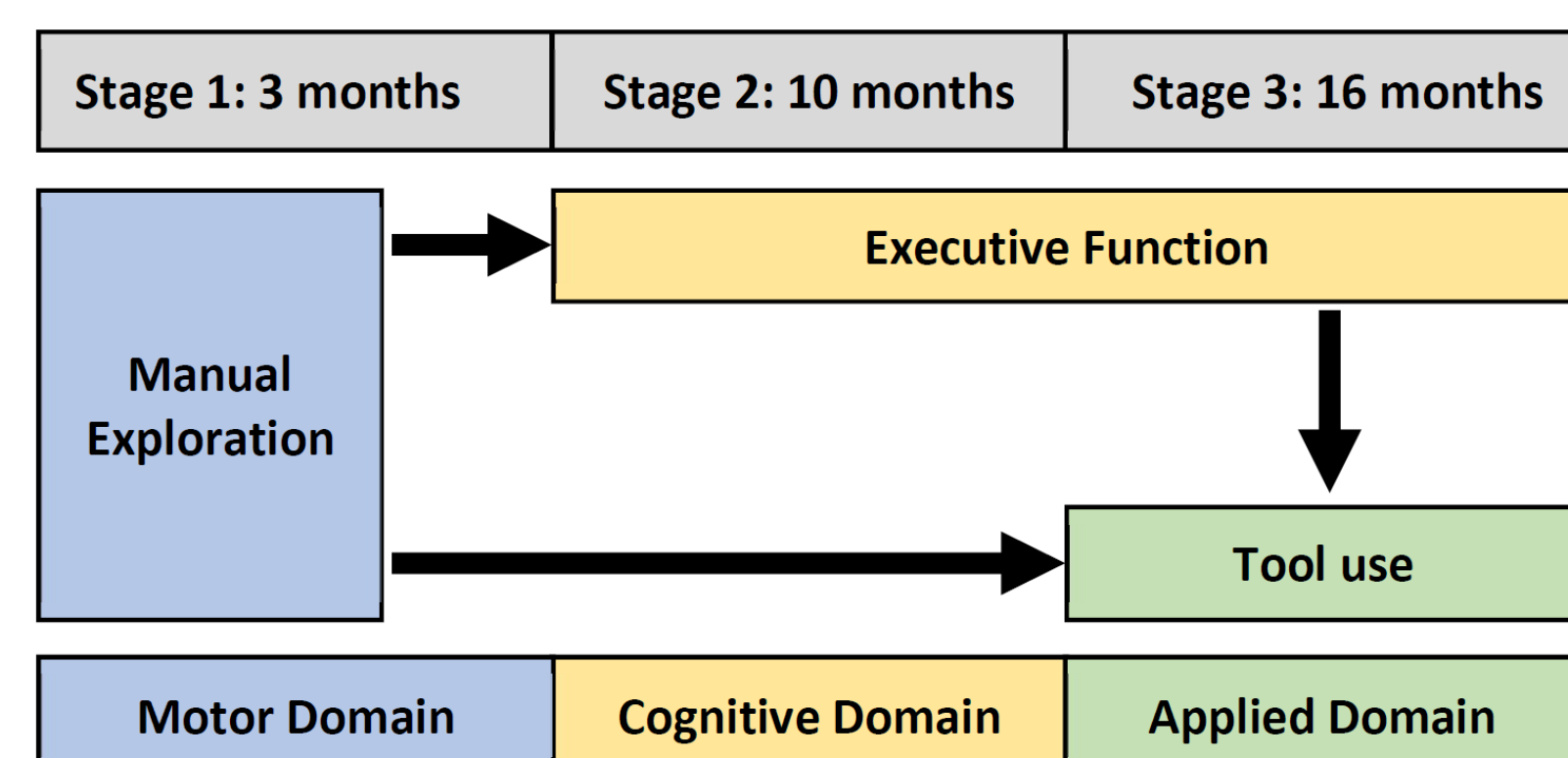


Figure 1: Study outline and predicted associations between early motor development, emerging executive function skills, and applied problem-solving.

Context

- Motor skills predict some developmental disorders.
- Embodied cognition suggests that learning is facilitated by our motor skills.
 - Do early emerging motor skills affect cognitive development, with potential long-term impacts for school readiness skills?
- The current study extends previous training studies to examine effects outside of motor domain
 - Emerging executive function skills and applied problem-solving during tool use.



Project Deliverables

- This seeding grant project aims to test 40 infants using four different training methods
- Training success will be quantified, and methods adjusted if necessary
- Preliminary results will be submitted to at least one conference
- Graduate student will use data for design of dissertation work
- Pilot-data will be used for future grant application
 - Targeting R21 submission in Spring 2022



Figure 2: Primary motor training method that will be used in the current study

Potential Impact

- Findings have implications for theory and practice
- Provide evidence for a developmental cascade linking motor with cognitive skills
 - Providing a mechanism explaining developmental change
- Provide empirical evidence for embodied cognition perspective
- Applications outside Psychology
 - Physical Therapy
 - Clinical interventions
 - Robotics and artificial intelligence

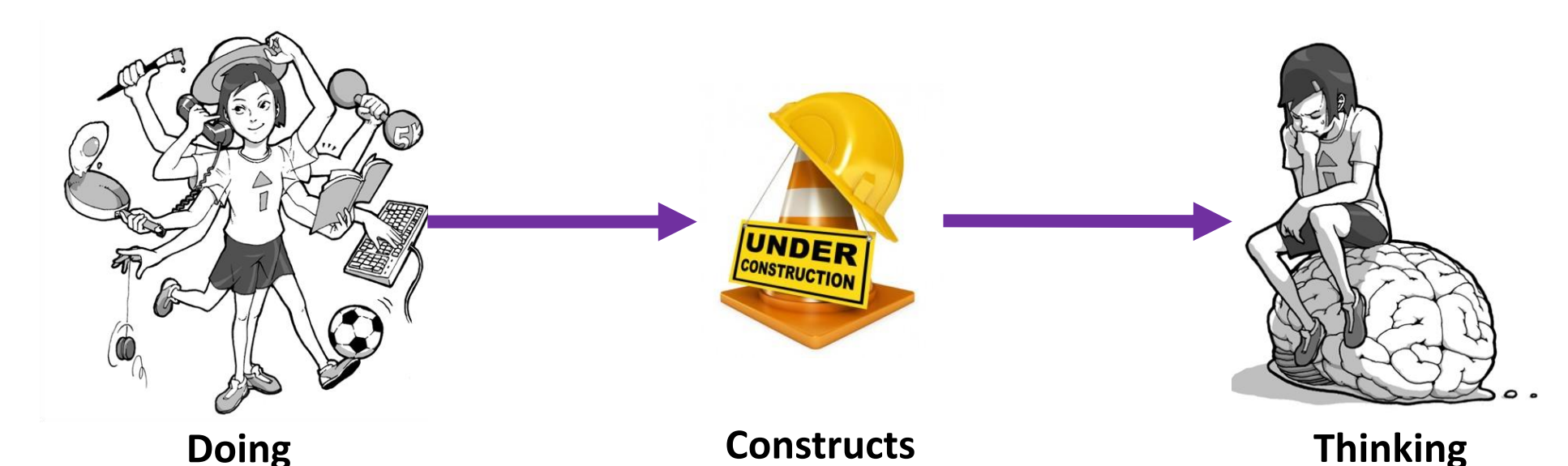


Figure 3: Theoretical framework, adapted from: Pfeifer & Bongard (2007)

Pilot Data

- Collected pilot data in November and December 2019
- Will implement changes to data collection procedure to ensure project success
 - Move to 100% online data collection
 - Make more use of parent-report measures

References

- Please see our lab website for more information:
 - www.onlinebabylab.com
- Full grant application with references can be accessed via QR code