

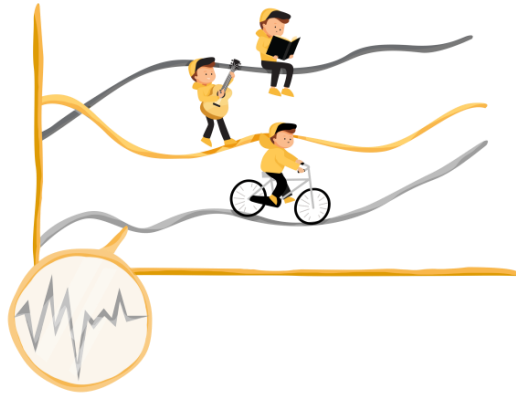


# Advancing Research on Learning Variability

## Research Agenda

# What is Learning Variability?

Learning Variability refers to differences in how people learn and develop; and changes in how people learn across time and contexts. **We focus on three types of learning variability for children ages 2-12:**



## Within-Person Variability

A child may struggle today with a math concept she seemed to know yesterday. She may excel at reading others' emotions but fail to recognize her own. As a child changes, how should teaching respond?



## Within-Group Variability

A class of 7 year olds might include students from several different home cultures, and some who can read Harry Potter while others still struggle with letter-sound correspondence. How can all be served well at once?



## Contextual Variability

The different contexts children encounter require them to adapt. Math class differs from art class. University learning is not the same as workplace learning. How can education prepare children to learn across contexts?

The problem: Childhood is full of variability. Yet education often provides one-size-fits-all instruction aiming at the average student. Insufficient research on how to address or embrace learning variability leaves few pathways for policy and practice to be grounded in rigorous scientific evidence.

# Jacobs Foundation Research Agenda

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- The opportunity at hand
  - The research community must expand the knowledge base on how children change, differ, and come to be prepared for the many learning contexts they will encounter throughout life.
- The Jacobs Foundation Research Agenda
  - The research agenda is a set of guiding research questions on learning variability.
  - It focuses on topics in the learning and developmental sciences for typically-developing children ages 2-12.
  - Answers to its questions would enable education systems to better design programming suited to learners' diverse and changing needs.



# Research Agenda: Grounding practice and policy in scientific evidence

Goal 1: Build the evidence base on learning variability.

Goal 2: Grow a community of researchers, funders, and practitioners committed to learning variability evidence.

The agenda is structured around 5 themes:

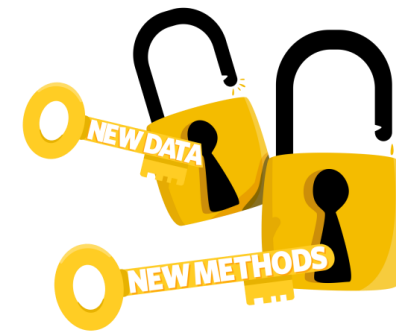
## Variability Themes

1. Within-person variability  
*Understanding day-to-day variation in children's skills*
2. Within-group variability  
*Learning in diverse groups*
3. Contextual variability  
*Preparing children to learn in different contexts*



## Supporting Themes

4. Designing for scale  
*Adapting learning solutions for different implementation settings*
5. Data and Methods  
*Enabling next-generation variability research*



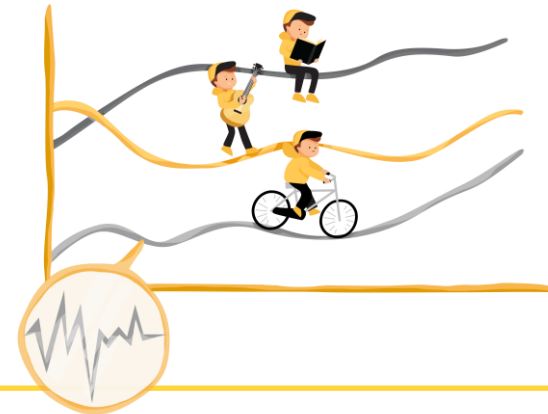
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Human behavior is inconsistent from one time to the next – a child may seem to understand a math concept one day, but not the next. And high performance on one skill does not necessarily mean high performance on another – a child who expertly identifies emotions in others may not recover easily from her own disappointment. Deeper understanding of how and why children vary within themselves could improve how educators tailor experiences for children, recognizing not only children's needs as individuals distinct from their peers, but also as individuals whose needs differ across dimensions and time.

*Example research question: Why do children show inconsistent behavior, skills and knowledge, from one time to the next?  
What are the explanations and/or the developmental purpose of such variability?*

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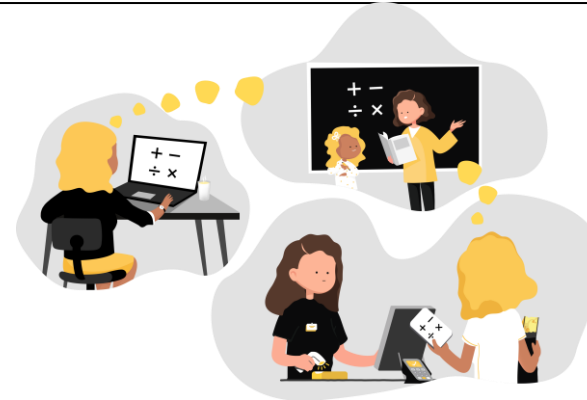
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How does a teacher effectively teach heterogeneous groups of children to meet their needs and foster deep understanding of the lessons at hand? In some contexts, heterogeneity may manifest as extreme differences in academic preparation between students. In other contexts, heterogeneity may mean diverse interests, but relative uniformity in academic preparation, parental education, and expectations of a secondary education degree.

*Example research question: How can 1-1 learning experiences more effectively adapt to cater to individual children's academic and nonacademic states and foster their development?*

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Children learn in many contexts throughout their day and lives – from playgrounds to classrooms to places of work. To succeed across these spaces, children need to learn to adapt to and shape the different contexts surrounding them. Yet educational settings usually focus on the child's immediate learning goals (e.g., proficiency on grade 1 math requirements), with little attention to adaptive flexibility. How might we better prepare children today to continue to learn across contexts and time in a rapidly changing world?

*Example research question: What are the skills, behaviors, knowledge, and characteristics that prepare children to learn in future contexts?*

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*Example research question:*

- *What characteristics of use environments interact with children's experience of core learning mechanisms of a learning program?*

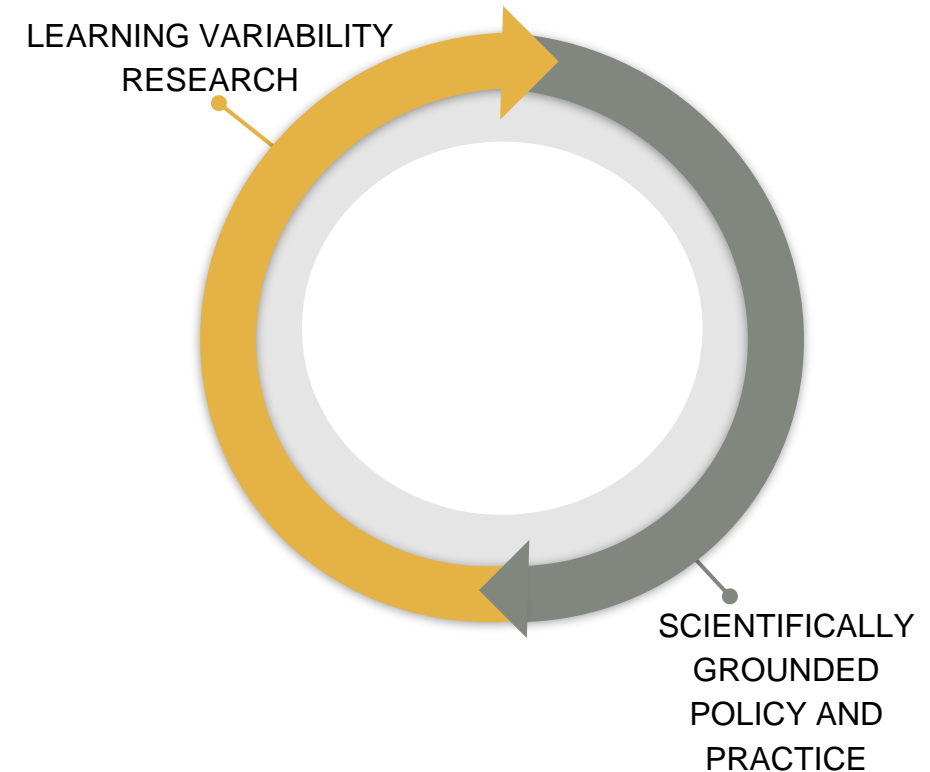
*Example research questions:*

- *How can in-school research methods and assessments be made equally valuable to practitioners and researchers?*
- *How might we develop more valid, reliable, and unbiased measurement tools for the study of key constructs of learning and development?*



## Conclusion: An Invitation to the Field

- If learning experiences took into account within-person, within-group, and contextual variability, then a greater diversity of children around the world would be supported, more often, to reach their full potential.
- Deep research on learning variability will facilitate such experiences. Thus, we offer guiding research questions to the field of early and middle childhood education – educators, researchers, and the funders of each.
- This Research Agenda is not comprehensive, peer reviewed, nor made by consensus. It is a set of ideas gleaned from the research community. More importantly, it is an invitation to the field to delve deeper into learning variability through conversations and collaborative projects. Together, we may advance the field to support all children to learn given their differences, their development, and the changing demands of a changing world.



*Please join us in conversation and in leadership.*