

Head Start on Engineering

Supporting Engineering Interest Development in Early Childhood

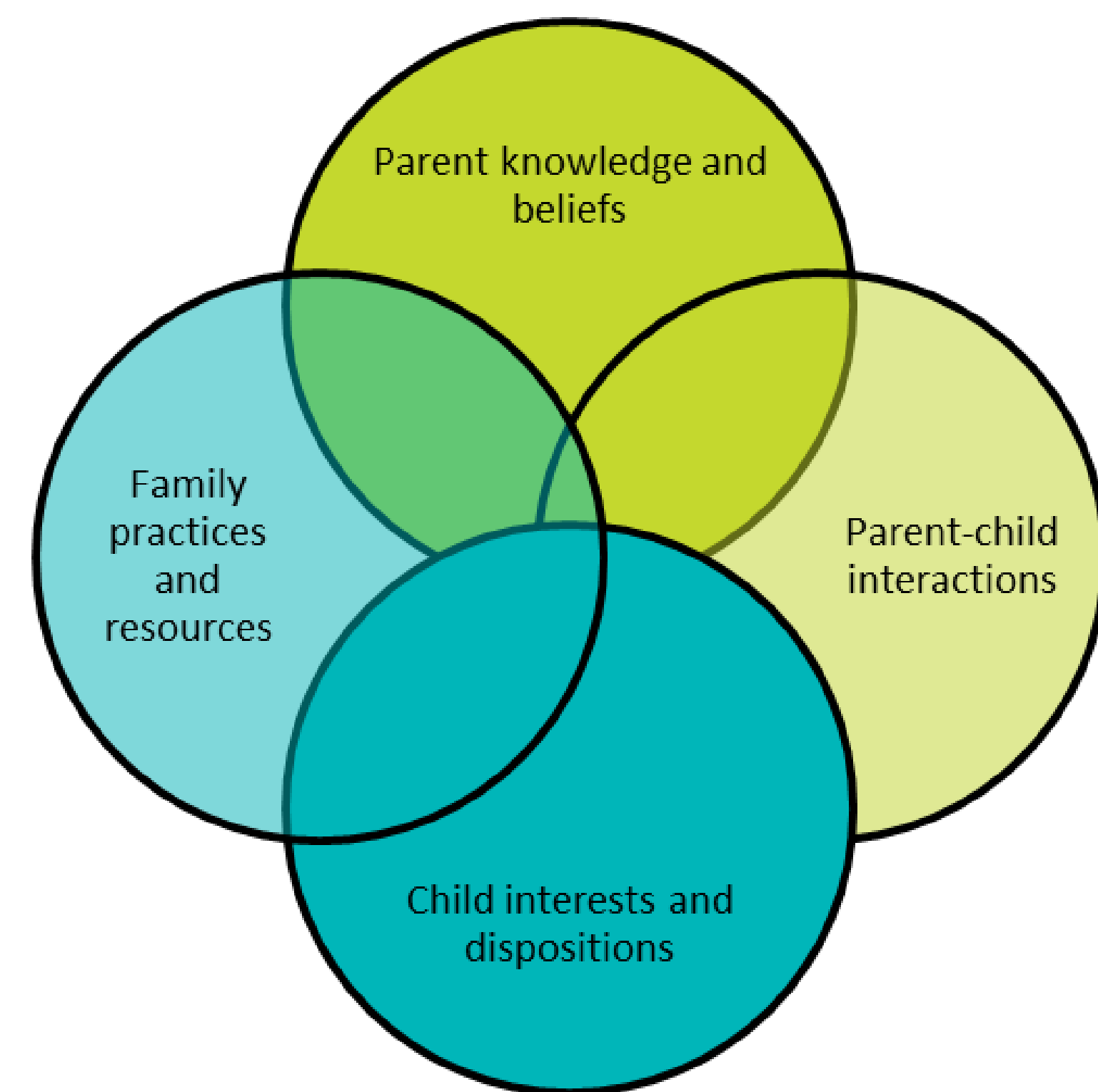
Visitor Studies Association Conference 2016, Boston, MA



HEAD START ON
ENGINEERING

Engineering-Related Interest Development Framework

Family-level conceptualization of early childhood interest development²



Early childhood engineering practices³

<i>Problem scoping</i>	Discussing goals and constraints
<i>Idea generation</i>	Brainstorming and planning
<i>Design evaluation</i>	Assessing whether or not a design has achieved its goals
<i>Revision</i>	Making changes to a design or testing a different approach

Project goals

- 1) Build relationships and establish collaborative structures and processes
- 2) Advance a long-term research program to develop and test a theoretical model of engineering-related interest development in early childhood
- 3) Pilot community programming, in partnership with a science center, Head Start, researchers, and families, to support the foundations of early childhood engineering-related interest development

Head Start on Engineering is a pathways project focused on developing the foundations of a long-term, community-based research program to (a) understand how preschool children (4 years old) and their families develop engineering-related interests in early childhood and (b) develop community partnerships and programs that support engineering interest pathways for these families. Understanding and honoring family beliefs, knowledge, and experiences is central to the project. In developing and implementing both the programs and research activities, the team has adopted culturally responsive and asset-based perspectives, drawing particular from the field of community-based participatory research.¹



Project challenges

- a) Developing an approach to collaboration and relationship building that is aligned with the scope of the project and authentically engages all partners and community stakeholders
- b) Conceptualizing the many complex factors and processes involved in early childhood engineering-related interest development in order to guide pilot research and program development
- c) Prioritizing goals and deliverables for this two-year pathways project

¹ Israel, B. A. (Ed.). (2013). *Methods for community-based participatory research for health* (2nd ed.). San Francisco, CA: Jossey-Bass. Reason, P., & Bradbury, H. (Eds.). (2013). *The SAGE handbook of action research: Participative inquiry and practice* (2nd ed.). London: SAGE.

² Pattison, S. A., Svarovsky, G. N., Corrie, P., Benne, M., Nuñez, V., Dierking, L. D., & Verbeke, M. (2016). *Conceptualizing early childhood STEM interest development as a distributed system: A preliminary framework*. Presented at the National Association for Research in Science Teaching Annual Conference, Baltimore, MD.

³ Dorie, B. L., Cardella, M. E., & Svarovsky, G. N. (2014). *Capturing the design thinking of young children interacting with a parent*. Presented at the 121st ASEE Annual Conference and Exposition, Indianapolis, IN.

⁴ Stake, R. E. (2006). *Multiple case study analysis*. New York: The Guilford Press.

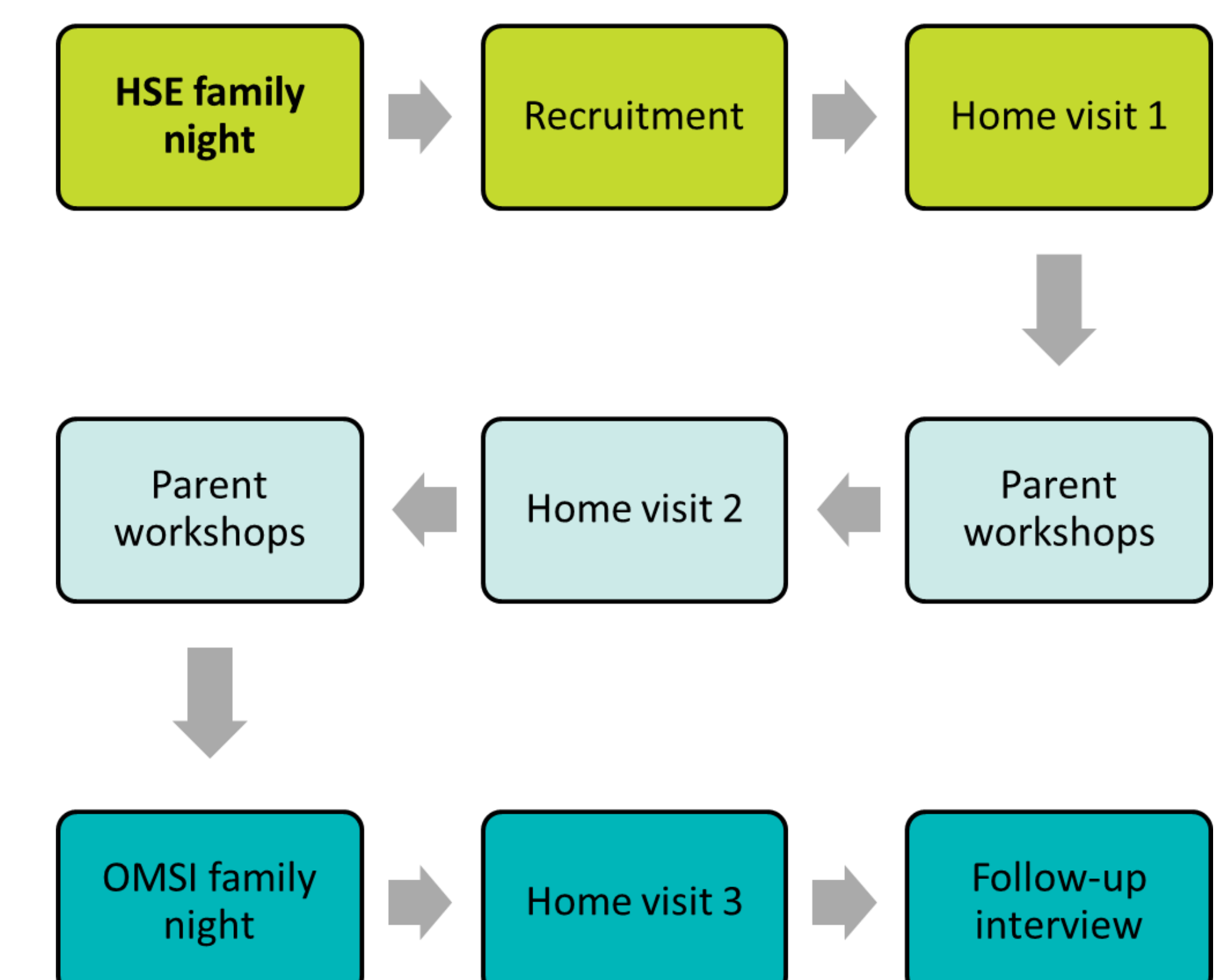
Researching Early Childhood Family-Level Interest

Research questions

- 1) What does early childhood, engineering-related interest development look like for parents and children participating in the HSE program, as viewed from a systems perspective?
- 2) What are the critical components and distinguishing characteristics of this evolving system?
- 3) How do parent-child dyad interest systems change during and after their participation in the HSE program? What are recognizable phases of interest development within parent-child dyad systems?

Study design

The study will follow a *multiple case study* approach⁴ in order to both explore the unique experiences of each family and develop a broader understanding of family-level early childhood engineering interest development. Cases will include six parent-child dyads who experience the entire program and three who participate in only



This material is based upon work supported by the National Science Foundation under Grant No. 1515628. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Principal investigators	Project team	
Scott Pattison	Veronika Nuñez	Mary Troutt
Pam Corrie	Lynn Dierking	Lorena Alexandrou
Marcie Benne	Shannon Weiss	Sherine Gerges
Gina Svarovsky	Monae Verbeke	Nahed Salib
	Raquel Stewart	Laurie Mortenson
	Cynthia Smith	Joanne VanMol
		Marissa Ethridge
		Heidi Anderson-Rubin