

### **Framing an ecological perspective on mathematics teachers' professional development**

Teachers' learning happens through a complex web of experiences. However, research on mathematics teacher professional development (PD) typically focuses on the direct influence of single activities or programs. PD researchers less often acknowledge the interactive impacts on teacher learning of the multiple encounters (with persons, activities, objects, etc.) that teachers have in different contexts and over time. In this talk I describe my theoretical, conceptual, and empirical work toward a more thoroughgoing ecological framing of mathematics teacher PD. Theoretically, my work builds on sociocultural, ecological, and complexity theories of learning. By comparing and contrasting these perspectives, this work conceptually brings forth and operationalizes three dimensions of teacher learning that are often overlooked: scope, interconnectedness, and temporality. Empirically, I first illustrate this ecological framework and its affordances with data from a 4-year research project rooted in video-based mathematics teacher conversations. Then, I discuss my current research program as a postdoctoral scholar, where I take an ecological perspective to study learning trajectories of pre-service mathematics teachers across the departments of education and mathematics at Vanderbilt University.