



Department of Mathematics and Statistics



Special Colloquium



Prospective Teachers' Unified Understandings of the Structure of Additive, Multiplicative, and Compositional Identities

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Abstract: United States curriculum standards advise mathematics teachers to teach students to attend to structure and understand how mathematical concepts are related. This requires teachers to have a structural perspective and a unified understanding of mathematical structures that span curricula. Studying abstract algebra provides a rich opportunity for prospective secondary mathematics teachers (PSMTs) to develop a structural perspective because it can lead PSMTs to develop unified understandings of algebraic structures in different contexts. This study investigates PSMTs' unified understandings of identities and characterizes the structural features of identities that PSMTs attend to. I contribute a theoretical framework of stages of PSMTs' identity schema development, which captures the structural features of identities they attend to in each stage as they reason about connections among additive, multiplicative, and compositional identities. I conclude with teaching implications for fostering PSMTs' development of unified understandings of algebraic concepts.

Keywords: Identity, Inverse, Abstract Algebra, Prospective Teachers

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