

Abstract Submitted
for the SES19 Meeting of
The American Physical Society

Students coordinating among multiple semiotic resources to solve physics problems NANDANA WELIWERIYA, University of Georgia, ELEANOR SAYER, Kansas State University — As part of a larger project to investigate problem-solving processes among upper-division physics students, we investigate how students construct and coordinate among multiple representations while solving problems. In this study, we use a social semiotic perspective to sketch a theoretical framework. We use this theoretical framework to investigate how semiotic resources might be combined to buildup representational spaces (diagrammatic, gestural, and algebraic) and then to solve physics problems. Data for this study is drawn from upper-division Electromagnetism I and Mechanics courses, where students engage in individual oral exams. In this talk, we present cases of Alan and Danny as exemplary cases for problem-solving. We use a resource graph representation to show how these students coordinate among resources (semiotic and conceptual resources) in their problem-solving activities. Our analysis of these cases illustrates a novel way of thinking about what kinds of representations students bring up and use while solving physics problems and how students bring up and use these representations.

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Date submitted: 30 Sep 2019

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