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Investigating the role of student achievement goals in conceptual physics learning

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Abstract

Helping students develop a conceptual understanding of physics is a critical goal of physics education. To better understand conceptual learning in physics, we investigated individual differences in students achievement goals, and their relation to learning. Past work suggests that mastery-approach goals predict conceptual learning and transfer, whereas other goals do not (Belenky & Nokes-Malach, 2013). However, little work has tested this prediction using different types of physics learning outcomes. In this study, students completed pre and post achievement goal surveys and received different types of instruction, followed by an extensive learning assessment. As expected, we found that mastery-approach goals were positively related to conceptual learning outcomes, whereas performance-approach goals were not. Unexpectedly, performance-avoidance goals, while not related to mastery-approach goals, were also predictive of conceptual learning under some conditions. We discuss the implications of these results for theories of motivation and learning.