Calculus Students’ Flexibility in Moving Among the Concepts of Function Transformation, Function Composition, and Function Inverse

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The concept of a function is a fundamental one in the learning of mathematics where good understanding equips a student with many ways of problem solving. Many students at the college level hold primitive understandings of functions, and firmly rooted misconceptions, that have ties to historic views of functions which described a function as a formulaic rule composed of variables. Students with this limited view of a function are likely to struggle specifically with processes that involve acting on a function, such as transformation of functions, composition of functions, and inverting functions. In this study, I examined calculus students’ flexibility in moving among the concepts of function transformation, function composition, and function inverse. Eight college calculus students participated in task-based interviews which sought to reveal their understanding of these function concepts. The results illustrated that the respondents used varied, yet limited, approaches to respond to tasks involving function transformation, function composition and the inverse of a function. There was no strong evidence that the respondents had flexibility in their forms of function representation, or function view. On the contrary, the findings pointed to a univalent dependence on the equation representation of a function with some cases in which the participants would not continue without knowing the equation of the given function.