

1077-M1-2171 **Aladar K Horvath*** (horvat54@msu.edu), A-713 Wells Hall, Michigan State University, East Lansing, MI 48823. *Definitions and Uses of Function Composition in Secondary and Early Collegiate Textbooks.*

There are many studies on students' thinking about functions (e.g., Leinhardt, Zaslavsky, & Stein, 1990; Oehrtman, Carlson, & Thompson, 2008), but only a few studies on students' thinking about the composition of functions and none on the teaching or curricular treatment of the composition concept. This study investigated the ways that composition is defined, explained, and used in the mathematics curriculum from high school algebra through the chain rule lesson in college calculus. The analysis of twelve textbooks revealed that composition is initially defined as a sequence of functions and later as an operation on functions; the algebraic representation was predominately used (more than three-fourths of the time); and first and second degree polynomials were more frequent than any other function type. This analysis also found that the functions used in textbooks' chain rule lessons were more complex and relied more heavily on the compositive structure than previous material. These results suggest that calculus students may not have a strong foundation with the compositive structure of functions prior to studying the chain rule and that they are trying to make sense of both concepts simultaneously. (Received September 21, 2011)