

1116-Q5-1001      **Joseph F. Wagner\*** ([wagner@xavier.edu](mailto:wagner@xavier.edu)), Department of Mathematics, Xavier University, 3800 Victory Parkway, Cincinnati, OH 45207. *Students' obstacles to making sense of the definite integral.*

Students use a variety of resources to make sense of integration, and interpreting the definite integral as a sum of products (rooted in the concept of a Riemann sum) is particularly useful in many physical contexts. This study of beginning and upper-level undergraduate physics students examines some obstacles students encounter when trying to make sense of integration, as well as some discomforts and skepticism some students maintain even after constructing useful conceptions of the integral. In particular, many students attempt to explain what integration does by trying to interpret the algebraic manipulations and computations involved in finding antiderivatives. This tendency, perhaps arising from their past experience of making sense of algebraic expressions and equations, suggests a reluctance to use their understanding of “what a Riemann sum does” to interpret “what an integral does.” (Received September 15, 2015)