

1116-Q6-2470      **Jungeun Park\*** (jungeunpark124@gmail.com), 15 Orchard Rd., Ewing Hall 501, University of Delaware, Newark, DE 19716. *Realizations of the Derivative in Three Widely Used Calculus Textbooks.*

This study analyzed realizations of the derivative in three widely used calculus textbooks based on the recent MAA calculus study using Sfard's communicational approach. The analysis of words and visuals in the textbooks focused on the limit process through which the derivative at a point was objectified, and words and visuals for the derivative process through which the derivative as a function was objectified. The analysis highlighted inconsistencies in realizations of the process and object, and an implicit treatment of the relations between different visuals. Specifically, although the initial and final objects (e.g., Difference Quotient and the derivative at a point) were mainly mediated with the same type of visuals (e.g., symbols, graphs), the limit process connecting these two objects was often mediated with a different type of visual or simply with words. Various graphs (zoomed-in graphs, secant segments, and secant lines) mediated the process, but their relations were not explicitly addressed. The analysis also highlighted that words were key in the process through which the derivative at a point was expanded to the derivative as a function. Symbols were frequently used in realization of both the limit process and the derivative process without any other mediators. (Received September 22, 2015)