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Jonathan D Troup* (jtroup@math.ou.edu). *Developing Students' Reasoning about the Derivative of Complex-Valued Functions with the Aid of Geometer's Sketchpad (GSP).*

In this paper, I share results of a case study describing the development of two undergraduate students' geometric reasoning about the derivative of a complex-valued function with the aid of Geometer's Sketchpad (GSP). My participants initially had difficulty reasoning about the derivative as a rotation and dilation. Without the aid of GSP, they could describe the rotation and dilation aspect of the derivative for linear complex-valued functions, but were unable to generalize this to non-linear complex-valued functions. Participants' use of GSP, speech, and gesture assisted with discovering function behavior, generalizing how the derivative describes the rotation and dilation of an image with respect to its pre-image for non-linear complex-valued functions, and recognizing that the derivative is a local property. (Received September 20, 2016)