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**Halil I. Tasova\*** (halil.tasova25@uga.edu), 105 Aderhold Hall, 110 Carlton Street, Athens, GA 30602, and **Kevin C. Moore** (kvcmoore@uga.edu). *Justification of an invariant relationship between two quantities: Coordinating quantities vs. steepness of tangent lines.*

Several researchers have illustrated that teachers' covariational reasoning is critical to their supporting students in understanding major precalculus and calculus ideas. In this presentation, we characterize pre-service teachers' (PSTs') thinking during a teaching experiment as they reasoned about rate of change between the distance a rider has traveled (i.e., arc length) around a Ferris wheel and the rider's distance from the horizontal diameter (i.e., height, and together the sine relationship). Both PSTs described "the height is increasing less and less as the arc length increases"; however, their reasoning entailed marked differences. Our analyses illustrate the PST who constructed a structure of the related quantities (i.e., equally partitioning the arc length and comparing the corresponding variations in height) was able to provide productive justifications regarding rate of change and the curvature of her constructed graphs, including in related but different situations than the Ferris wheel. In contrast, the PST who reasoned about perceptual features of graphs and situations (e.g. steepness of tangent lines) was not able to provide justifications regarding the rate of change and curvature of their graphs that were generalizable to other situations and graphs. (Received September 19, 2017)