1056-N1-242 **Kien H. Lim*** (`kienlim@utep.edu`), Department of Mathematical Sciences, 500 W. University Ave, University of Texas at El Paso, El Paso, TX 79968-0512. *Bridging Proportional Reasoning and Algebraic Reasoning: A Focus on Co-variation and Invariance Using Contextualized Problems.*

Proportion and algebra are typically connected via linear functions, by helping students relate a/b = c/x to y = mx which is subsequently extended to y = mx + b. A way to deepen pre- and in-service teachers' understanding is to draw their attention to the structure underlying a contextualized-problem situation, by focusing on co-variation and invariance. Consider the following missing-value problem: Alex and Bob were running at the same speed around a track. Alex started first. When Alex had run 10 laps, Bob had run 6 laps. When Bob completed 15 laps, how many laps had Alex completed? 31% of 81 pre-service K-4 teachers over-generalized proportionality and chose 25 laps (40% chose 11 laps). Such a problem can help pre-service teachers recognize their disposition to apply proportional strategies to solve missing-value problems without attending to quantities and relationships. A follow-up question such as "write an equation to relate the number of laps Bob had completed, b, to laps Alex had completed, a," can help pre-service teachers recognize that the difference a - b is invariant while a and b co-vary. For proportional situations, the ratio a/b is invariant. For inverse-proportional situations, the product ab is invariant. For other situations, the sum a + b could be invariant. (Received September 08, 2009)