

RELATIONSHIP BETWEEN PROPORTIONAL REASONING AND ACHIEVEMENT FOR EARLY ADOLESCENT GIRLS⁷

Michelle P. Longest
Sarah B. Berenson

Axelle Person
Joan J. Michael

Mladen A. Vouk
North Carolina State University

Proportional reasoning is a key topic in the middle-grade curriculum (Lamon, 1995). In a seven-year longitudinal study, we will attempt to build a model that explains higher achieving girls' persistence in advanced math courses. Here we examine proportional reasoning as a critical variable in girls' success in advanced math courses. Our quantitative data was collected from more than 200 middle school girls who volunteered to attend a summer camp. These data included girls' scores on two proportional reasoning tests: the first (1999) focused only on missing value problems, while the second was the *Proportional Reasoning Assessment Instrument* developed by Allain (2001). Girls' scores on annual state tests for Pre-Algebra, Algebra I, and Geometry were also collected. For data analysis, we used Pearson product correlation coefficients to examine strengths of the linear relationships between proportional reasoning scores and these other variables. Table 1 shows correlation coefficients for individual comparisons. We recognize that results obtained with small sample sizes might be less reliable than for a larger n. When combining three years of data to increase our sample size, strong correlations were also found between proportional reasoning and end-of-grade scores ($r = .5514$, $n = 78$). Preliminary results of strong positive correlations between proportional reasoning and achievement on standardized tests indicate our need to begin building a multivariate model of persistence.

Table 1. Pearson Correlation Coefficients

Camp	PR vs. Pre-Algebra (pre-camp)	PR vs. Algebra I (one year later)	PR vs. Geometry * (two years later)
1999	.8145 (n=38)	.7144 (n=21)	.7441 (n=18)
'00&'01	.6127 (n=63)	.5576 (n=46)	N/A

* Data collection still in progress

References

- Allain, A. (2001). *Development of an instrument to measure proportional reasoning among fast track students*. Unpublished master's thesis, North Carolina State University, Raleigh.
- Lamon, S. (1995). Ratio and proportion: Elementary didactical phenomenology. In J. T. Sowder & B.P. Schappelle (Eds.), *Providing A Foundation for Teaching Mathematics in the Middle Grades*, (pp.167-198). Albany, NY: State University of New York Press.

⁷ ¹This research is supported in part by NSF Grant # EIA-0204222 and NSF Grant # 9813902 . The views expressed here do not necessarily reflect the views of the National Science