HIGH SCHOOL MATHEMATICS TEACHERS' EVOLVING UNDERSTANDING OF *COMPARING DISTRIBUTIONS*

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Statistics has achieved a position of status in the secondary curriculum (College Board, 2006b; Franklin et al., 2007; NCTM, 2000) and understanding of statistics is essential for high school mathematics teachers if they are to engage students in thoughtful pursuit of statistical ideas. High school teachers typically are ill-prepared in the area of statistics (Ben-Zvi & Garfield, 2004a; CBMS, 2001; Shaughnessy, 1992, 2007). Using methods of design research, this study investigated 56 high school mathematics teachers' understanding of the statistical concept of *comparing distributions* and demonstrated that a modest four-day, statistics-oriented, technology-rich, professional development program may significantly improve teachers' understanding.

Comparing distributions was broadly conceived to encompass a triadic, multidirectional relationship between the statistical concepts of *distribution*, *variability*, and *sampling distributions*. Innovative statistical professional development materials for high school mathematics teachers were constructed and implemented, and the efficacy of the professional development was examined through coordinating analyses of written pre/post-content assessments, pre/post-interviews, written teacher reflections, and professional development video artifacts. In addition to improved statistical content knowledge, teachers developed facility with dynamic statistical technology (*CPMP-Tools*

and *Fathom2*) and resampling approaches to statistics. Teachers participated in a reflective, learner-centered classroom environment with the potential to impact their own teaching practices. More broadly, the results of this study have implications for professional development of in-service mathematics teachers, pre-service teachers' statistical education, and the education of secondary students.