HIGH SCHOOL TEACHERS' CONDITIONAL PROBABILITY CONTENT KNOWLEDGE

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BACKGROUND

Most states in the USA have recently adopted the Common Core state standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). Compared to most prior published curricula, the Common Core contains substantially more probability and statistics topics. Anecdotal reports suggest that current high school mathematics teachers have concerns about the new material. In many cases, current teachers have never taught the topics, meaning they have little pedagogical knowledge on how students learn. In some cases, current teachers have never even seen the topics, meaning they lack content knowledge. Administrators, professional development planners, and researchers would benefit from information on the strengths and weaknesses of current teachers.

THE STUDY

Looking through the new curriculum, I decided to focus on a relatively un-scrutinized area, conditional probability. I found five tasks in the literature that covered conditional probability topics in the Common Core high school curriculum. Each problem had at least one published report on how learners attempted to solve the problem, a basis for examining teachers' pedagogical knowledge. The tasks include a ball drawing game (Mathematics Assessment Resource Service, 2012); testing a new cream for rashes (Kahan, Peters, Dawson, & Slovic, 2013); reading a table of survey results (The College Board, 2010); finding retest probabilities (The College Board, 2009); and the taxicab witness problem (Kahneman & Tversky, 1972).

I interviewed approximately 25 practicing United States high school mathematics teachers. During the interviews, participants worked the tasks, explained their solutions, and then discussed possible student approaches and misconceptions with the interviewer. The interviews also included open-ended discussion on views about probability and statistics and concerns the teachers had with instruction in the curriculum.

Here, I present the teachers' results on content knowledge, which show a variety of levels of performance, including some places where teachers may need support and professional development.

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