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STRATEGIC INFERENCE OF MEANS AND VARIANCES: AN INVESTIGATION OF ADULT AND CHILD NUMERICAL PREDICTION (172 pp.)

Co-Directors of Dissertation: Bradley J. Morris, Ph.D.
Christopher A. Was, Ph.D.

Everyday we come across the need to make predictions based on sets of numbers. For example, thinking about past prices of gas to estimate how much an upcoming fill up will cost. Prediction is important to study because it represents an essential skill in reasoning with numbers in context, which is a specific component in the Common Core Mathematics Standards. However, little is known about the cognitive mechanisms underlying prediction or how to provide effective instruction. Three experiments investigated the strategies that adults and 4th grade children use to make predictions from sets of four, six, or eight numbers. They were told that each number in each set represented the distance a batter hit a baseball. Then after seeing each set for a limited amount of time, they were asked to predict how far the batter would hit the next baseball. It was hypothesized that predictions would reflect the set means. Adults' predictions were closer to the set means than children's predictions, although this difference was not statistically significant. Trying to average the set numbers, which seemed to be the most effective strategy, was the strategy most used by adults. Conversely, children used other strategies more often than averaging and exhibiting a more rudimentary understanding and use of averaging strategies. However, the fact that children employed inexact averaging strategies, without the aid of prior averaging instruction, provides evidence that intuitive number approximation may extend to estimating predictions.