Categorization of Probability Word Problem: Effects of Prior Statistical Training and Semantic Schema

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Abstract: A problem sorting task was used to examine how the semantic content of probability word problems affects problem understanding and categorization, for students with various levels of statistical training. In the task, undergraduate and graduate students were asked to sort probability problems into groups by similarity of solution. The problems varied by relevant probability principle, by type of semantic schema, and by cover-story surface content. Results showed that both less-trained students and more-trained students tended to sort problems by relevant probability principle, but students with more statistics training did this more consistently. Both groups of students tended to be affected in the sorting task by semantic schema, defined here as intermediate-level abstractions of the problem structure. For example, when a permutation problem described assignment of people to people, students showed a strong tendency to group it with independent-events problems with a people-to-people matching schema.