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Award Abstract #1155924

Manipulating numeracy: Causal effects on judgments and decisions

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[Division of Social and Economic Sciences](#)

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Investigator(s): Ellen Peters peters.498@osu.edu (Principal Investigator)Sponsor: Ohio State University
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ABSTRACT

Recent research in numeracy suggests that individuals differ substantially in their abilities to process numbers and that, in fact, many people are "innumerate". In our increasingly technical world, innumeracy (a lack of ability to understand and use basic probability and mathematical concepts) may be a critical disadvantage to making good decisions in financial, medical, and other domains.

In this project, the Principal Investigator will test whether numeracy (as measured through scores on a math test and manipulated in a statistics course) has a causal influence on decision-making abilities tested in the lab and on the quality of judgments and decisions that individuals make. Numeracy will also be manipulated through an in-class self-affirmation manipulation shown previously to improve classroom learning of topics found threatening by some students. She will conduct two series of studies. Study Series 1 will focus on numeracy's causal role in decision-making abilities and (longitudinally) on risk and decision outcomes. Study Series 2 will examine its causal

role in additional decision-making abilities, explicit and implicit math attitudes, and important process mechanisms (for example, attention to numbers).

In terms of broader impacts, this research will examine whether improving number ability will subsequently improve how people make decisions in health, financial, and other domains. Numerical information is often necessary to making good decisions (e.g., mortgages, health insurance, credit card debt, medical treatment options). Policy makers and others generally assume that if you provide the appropriate numbers, people will understand and use them. Previous research, however, has shown that individuals lower and higher in numeracy rely on different sources of information in decisions, and that those lower in numeracy comprehend less and may make poorer decisions when numbers are involved. For example, lower numeracy has been associated with less ability to follow complex medication regimens and less adequate retirement savings. Numeracy research, however, has been largely correlational in nature and its causal influence is not well understood relative to other third variables (for example, general intelligence). The proposed research should add substantially to our understanding of psychological mechanisms underlying decisions and their impact on quality of life and wellbeing. In short, we propose to test whether numeracy training may be the educational gift that keeps on giving. Broader impacts also include training and career development of graduate and undergraduate students. Finally, the project is expected to inform efforts to improve the teaching of statistics to undergraduates

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