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Probabilistic thinking: analyses from a psychological perspective.

Chernoff, Egan J. (ed.) et al., Probabilistic thinking. Presenting plural perspectives. Dordrecht: Springer (ISBN 978-94-007-7154-3/hbk; 978-94-007-7155-0/ebook). Advances in Mathematics Education, 123-126 (2014).

Summary: In this paper, we describe the major lines of debate that run through the research on probabilistic understanding from a psychological perspective. A first line deals with the question whether humans can be considered as unbiased, natural-born statisticians, or rather as biased, error-prone probabilistic thinkers. Although authors propose radically different viewpoints on this human (ir)rationality issue, we argue that these viewpoints are not very irreconcilable when it comes to the implications. It seems that whatever viewpoint taken, there is agreement the existing conceptions in students should be taken as the starting point, and productive bridging approaches should lead students towards normatively correct understanding. Parallel to the (ir)rationality debate, the affective aspect of probabilistic reasoning also receives research attention. Even if people possess all “mindware”, superstitious thinking, memory distortion and other affective mechanisms may affect normative reasoning. Finally, probabilistic reasoning is also socioculturally based, and people are not always necessarily and consistently engaging their mathematical insights when approaching probabilistic situations. Our conclusion is that the psychological perspective on probabilistic reasoning and the educational perspective seem to be two sides of the same coin.

Classification: K50 C20 C60 C30

Keywords: probabilistic thinking; rationality; affect; probabilistic reasoning

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