RESEARCH ARTICLE | BIOLOGICAL SCIENCES |

Cortisol shifts financial risk preferences

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Significance

Many influential models in economics, finance, and neurobiology assume risk preferences are a stable trait. In this study we find they are not. We examine the effects of chronic stress on financial risk taking by raising cortisol levels in volunteers over an 8-d period using individually tailored hydrocortisone regimens. We find that they become more risk-averse and that the overweighting of small probabilities becomes more exaggerated among men relative to women. We designed our protocol to maintain ecological validity: The increase in cortisol among participants replicated levels we had previously observed in real traders when faced with uncertainty and market volatility. Physiology-induced shifts in risk preferences may thus be a cause of market instability that has been hitherto overlooked by economists, risk managers, and central bankers.

Abstract

Risk taking is central to human activity. Consequently, it lies at the focal point of behavioral sciences such as neuroscience, economics, and finance. Many influential models from these sciences assume that financial risk preferences form a stable trait. Is this assumption justified and, if not, what causes the appetite for risk to fluctuate? We have previously found that traders experience a sustained increase in the stress hormone cortisol when the amount of uncertainty, in the form of market volatility, increases. Here we ask whether these elevated cortisol levels shift risk preferences. Using a double-blind, placebo-controlled, cross-over protocol we raised cortisol levels in volunteers over 8 d to the same extent previously observed in traders. We then tested for the utility and probability weighting functions underlying their risk taking and found that participants became more risk-averse. We also observed that the weighting of probabilities became more distorted among men relative to women. These results suggest that risk preferences are highly dynamic. Specifically, the stress response calibrates risk taking to our circumstances, reducing it in times of prolonged uncertainty, such as a financial crisis. Physiology-induced shifts in risk preferences may thus be an underappreciated cause of

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