2

loss aversion

decision variability

The loss aversion ratio...

Daniel Kahneman and Amos Tversky

How many people would take the following coin flip bet??

Heads: win $10
Tails: lose $10

Heads: win $20
Tails: lose $10

Heads: win $22.50
Tails: lose $10

Loss aversion ratio:
22.50/10.00 = 2.25

Tversky, A. & Kahneman, D. (1992). “Advances in prospect theory: Cumulative representation of uncertainty.” Journal of Risk and Uncertainty 5(4): 297–323.

Image: Amos Tversky and Daniel Kahneman. Courtesy: Penguin Random House

Is loss aversion universal?

RUNNING HEAD: A META-ANALYSIS OF LOSS AVERSION

A meta-analysis of loss aversion in risky contexts

Lukasz Walasek[A] Timothy L. Mullett[B] Neil Stewart[B]

[A] Department of Psychology, University of Warwick

[B] WBS, University of Warwick

This paper suggests that there is quite a bit of variability.

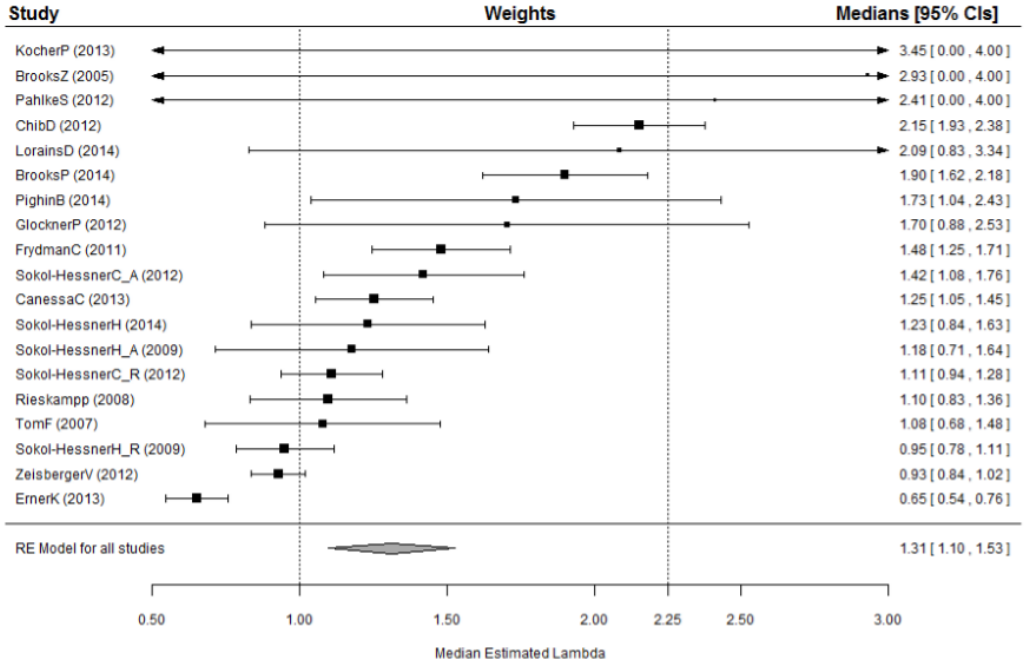


Figure 2. Forest plot of median values of λ across all studies. Weights were estimated using a random-effect meta-analysis. Confidence intervals that extend beyond the scale are indicated by arrows.

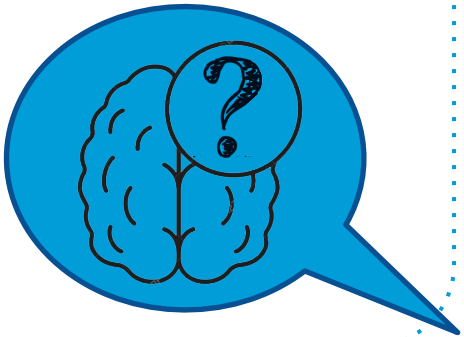
Walasek, Lukasz and Mullett, Timothy L. and Stewart, Neil, A Meta-Analysis of Loss Aversion in Risky Contexts (June 1, 2018). Available at SSRN: https://ssrn.com/abstract=3189088 or http://dx.doi.org/10.2139/ssrn.3189088

Why are some people more loss averse?

Does **your culture** determine how risk averse you are?

Does your **power-status** change your propensity for risk?

Is it **education** *level?*



Journal of Behavioral Decision Making, *J. Behav. Dec. Making*, **30**: 270–281 (2017)
Published online 5 February 2016 in Wiley Online Library (wileyonlinelibrary.com) **DOI:** 10.1002

The Impact of Culture on Loss Aversion

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ABSTRACT

Based on the literature on the relationship between culture, emotion, and loss aversion, we derive that culture can influence the degree of loss aversion. To test our hypotheses, we conduct a standardized survey in 53 countries worldwide that includes the questions from the Hofstede survey on cultural dimensions as well as lottery questions on loss aversion. The results show that individualism, power distance, and masculinity increase loss aversion as predicted, whereas the impact of uncertainty avoidance is less significant. Moreover, we also find a relation between the distribution of major religions in a country and loss aversion. In comparison, the connection of loss aversion to macroeconomic variables seems to be much smaller. Copyright © 2016 John Wiley & Sons, Ltd.

Does your culture determine how risk averse you are?

Journal of Behavioral Decision Making, J. Behav. Dec. Making, 30: 270–281 (2017)

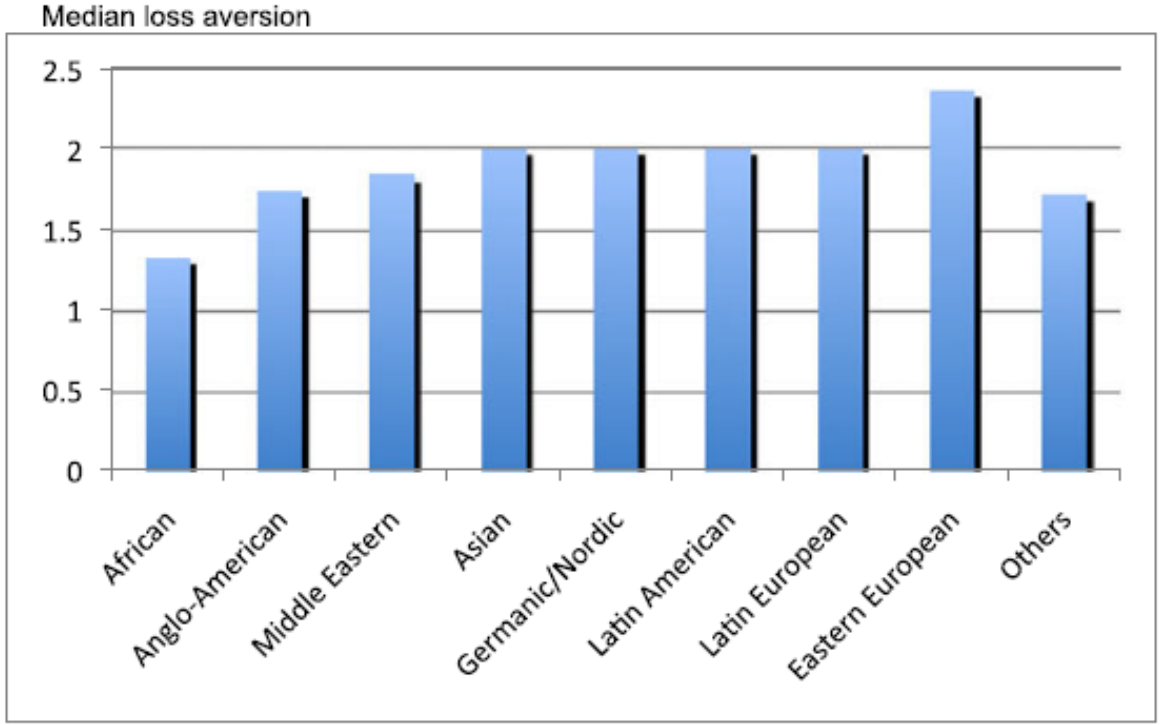

Figure 1. Median loss aversion θ for the cultural clusters in our study. [Colour figure can be viewed at wileyonlinelibrary.com]

Individualistic vs collectivistic

Journal of Behavioral Decision Making, J. Behav. Dec. Making, 30: 270–281 (2017)

Inequality? Power Distance Index?

Journal of Behavioral Decision Making, J. Behav. Dec. Making, 30: 270–281 (2017)

Masculinity?

Journal of Behavioral Decision Making, J. Behav. Dec. Making, 30: 270–281 (2017)

Measuring the impact of interaction between children of a matrilineal and a patriarchal culture on gender differences in risk aversion

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Edited by Catherine Coleman Eckel, Texas A&M University, College Station, TX, and accepted by Editorial Board Member Jennifer A. Richeson February 12, 2019 (received for review May 16, 2018)

Many studies find that women are more risk averse than men. Why does such a gender gap exist, and how malleable is this gender gap in risk aversion? The paper takes advantage of a rare setting in which children of the matrilineal Mosuo and the traditionally patriarchal Han attend the same schools in Yunnan, China to shed light on these questions. In particular, we exploit the fact that children would experience a shock in gender norms when they start to intermingle with children from other ethnic groups with the opposite gender norms at school. Using survey and field experiments, we elicit risk attitudes from Mosuo and Han elementary and middle school students. We find that, at the time when they first enter school, Mosuo and Han children exhibit opposite gender norms—Mosuo girls take more risks than Mosuo boys, while Han girls are more risk averse than Han boys, reflecting cultural differences. However, after Mosuo students spend more time with Han students, Mosuo girls become more and more risk averse. By age 11, Mosuo girls are also more risk averse than Mosuo boys. We also observe a shrinking gap in risk aversion for Han over time. Using random roommate assignment for boarding middle school students, we find Mosuo boys who have fewer Mosuo roommates behave more similarly to Han boys. This shows that risk preferences are shaped by culture and malleable in response to new environments.

gender norm | risk | socialization | peer | culture

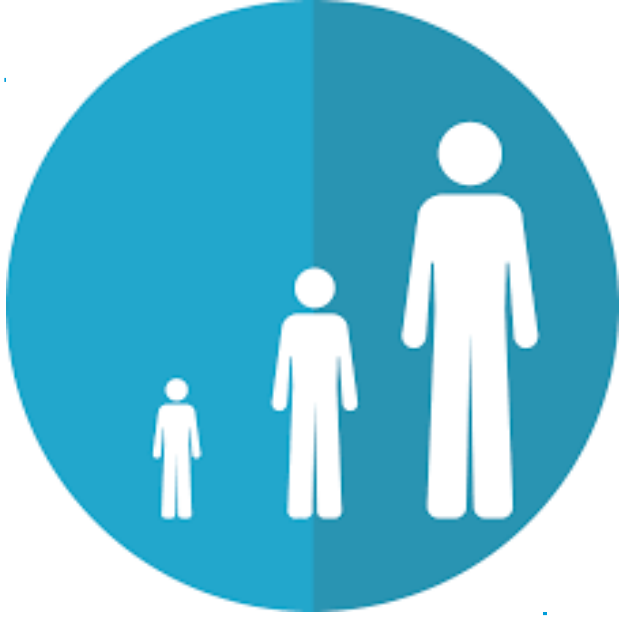
Elaine M. Liu, Sharon Xuejing Zuo. Measuring the impact of interaction between children of a matrilineal and a patriarchal culture on gender differences in risk aversion. *Proceedings of the National Academy of Sciences*, 2019;

“...risk preferences are shaped by culture and malleable in response to new environments.”

Significance

Studies show that women are more risk averse than men. We explore sources and malleability of such differences in a setting where children of two culturally distinct populations, the matrilineal Mosuo and the traditionally patriarchal Han, come together to attend school. Using survey and field experiments, we elicit individual risk attitudes from elementary and middle school students from the two populations. When they first enter school, Mosuo girls take more risks than Mosuo boys, while Han girls are more risk averse than Han boys, reflecting cultural differences. However, after spending time in the majority-Han environment, Mosuo children adopt the risk preferences of the majority. This shows that risk preferences are shaped by culture and malleable in response to new environments.

Elaine M. Liu, Sharon Xuejing Zuo. Measuring the impact of interaction between children of a matrilineal and a patriarchal culture on gender differences in risk aversion. *Proceedings of the National Academy of Sciences*, 2019;



Altered Value Coding in the Ventromedial Prefrontal Cortex in Healthy Older Adults

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Yu J, Mamerow L, Lei X, Fang L and Mata R (2016) Altered Value Coding in the Ventromedial Prefrontal Cortex in Healthy Older Adults. Front. Aging Neurosci. 8:210. doi: 10.3389/fnagi.2016.00210

Behavioral/Systems/Cognitive

Neural Correlates of Anticipation Risk Reflect Risk Preferences

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Individual risk preferences have a large influence on decisions, such as financial investments, career and health choices, or gambling. Decision making under risk has been studied both behaviorally and on a neural level. It remains unclear, however, how risk attitudes are encoded and integrated with choice. Here, we investigate how risk preferences are reflected in neural regions known to process risk. We collected functional magnetic resonance images of 56 human subjects during a gambling task (Preuschoff et al., 2006). Subjects were grouped into risk averters and risk seekers according to the risk preferences they revealed in a separate lottery task. We found that during the anticipation of high-risk gambles, risk averters show stronger responses in ventral striatum and anterior insula compared to risk seekers. In addition, risk prediction error signals in anterior insula, inferior frontal gyrus, and anterior cingulate indicate that risk averters do not dissociate properly between gambles that are more or less risky than expected. We suggest this may result in a general overestimation of prospective risk and lead to risk avoidance behavior. This is the first study to show that behavioral risk preferences are reflected in the passive evaluation of risky situations. The results have implications on public policies in the financial and health domain.

S. Rudorf, K. Preuschoff, B. Weber. Neural Correlates of Anticipation Risk Reflect Risk Preferences. *Journal of Neuroscience*, 2012; 32 (47):

The ventral striatum has been reported to code for expected reward and the corresponding reward prediction error on the one hand (Schultz et al., 1997; Knutson et al., 2001; Preuschoff et al., 2006) and anticipation risk on the other (Fiorillo et al., 2003; Preuschoff et al., 2006). It is important to note that anticipation risk, i.e., the expected outcome variance, also plays a significant role in reward learning because it represents a predictability measure (Preuschoff and Bossaerts, 2007). In other words, in an uncertain, highly variable environment, a deviation from the forecast is not surprising. Under low risk conditions, though, where the outcome can be predicted with high confidence, any prediction error is much more informative and should thus have more impact. On a neural level, the sustained anticipation risk signal in the ventral striatum may serve as such an amplifier for the subsequent reward prediction error.

S. Rudorf, K. Preuschoff, B. Weber. Neural Correlates of Anticipation Risk Reflect Risk Preferences. *Journal of Neuroscience*, 2012; 32 (47):

The anterior insula, in contrast, is involved in risk learning (Preuschoff et al., 2008). Our study shows that the anterior insula reflects both anticipation risk and the corresponding risk prediction error. This is an important function because only under uncertain conditions (e.g., risk) can an organism experience prediction errors and thus learning (Rescorla and Wagner, 1972). Hence, both risk-seeking and risk-averse behavior can be appropriate at times. The choice of which risk behavior to engage in is likely to depend on the individual risk evaluation. Our results show that the individual risk behavior indeed corresponds to differential evaluation and updating of risk information. In risk averters, the response to negative risk prediction errors is elevated, implying that negative errors are not perceived as strongly (i.e., as negatively) as in risk seekers. Interestingly, this can be reconciled with the finding that risk averters show a stronger response in high-risk situations. Assume that risk learning parallels reward learning in that risk is updated based on past risk prediction errors. A decision maker who places too little emphasis on negative as compared to positive risk prediction errors will on average overestimate risk because she or he does not sufficiently reduce her or his estimate after experiencing negative errors. This effect is stronger for high-risk than for low-risk

S. Rudorf, K. Preuschoff, B. Weber. Neural Correlates of Anticipation Risk Reflect Risk Preferences. *Journal of Neuroscience*, 2012; 32 (47):