

UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

The formation of superstitions in an uncontrollable environment

Permalink

<https://escholarship.org/uc/item/5fx4t61x>

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 45(45)

Authors

Lu, Haoyang
Teng, Tianyuan
Zhang, Hang

Publication Date

2023

Peer reviewed

The formation of superstitions in an uncontrollable environment

Haoyang Lu

Peking University, Beijing, Beijing, China

Tianyuan Teng

Peking University, Beijing, China

Hang Zhang

Peking University, Beijing, China

Abstract

Superstitions are false beliefs about causality, closely related to the illusory control of luck. Previous research often focused on their influencing factors, whereas the cognitive processes underlying the formation and persistence of superstitions were understudied. Here we designed a behavioral task to track the evolution of superstitious beliefs over time. In a series of trials participants attempted to produce rewardable keypress patterns, but unbeknown to them the outcomes were independent of their actions. Similarity analysis of keypress patterns revealed that participants adopted the win-stay, lose-shift strategy, a heuristic to maximize rewards, and those under high reward rates converged to a few patterns. Similarly, participants' perception of controllability were higher under high reward rates but increased with their perceived instead of the actual reward rate across conditions. Our findings suggest that the formation of superstitious beliefs is motivated by reward maximization but associated with distorted perception of reward rate.