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Letter to the Editor

Intolerance of uncertainty and decision making in generalized anxiety disorder patients



Dear editor,

Relatively little is known about the behavioral consequences of intolerance of uncertainty (IU). This tendency to react negatively to uncertain and ambiguous events, independent of their probability of occurrence and their associated consequences, is considered to play a causal role in producing worry (Dugas et al., 1998). One behavioral consequence of IU that has been studied are differences in decision making, a complex process that generally includes measuring and weighing the conceivable costs of different options against the possible rewards to be gained (Zhang et al., 2015). In their study among 50 undergraduate students, Luhmann et al. (2011) used a simple laboratory task in which participants chose between small, low-probability rewards available immediately at the beginning of each trial and larger, high-probability rewards only available after some variable delay. Results showed that high IU-participants more often chose the riskier, immediate option suggesting that their decision was not driven by risk-aversion per se, but may be driven by the delay of waiting which magnifies the unpleasant affective response to uncertainty. Furthermore, high IU was also predictive of greater sensitivity to unfavorable outcomes, such that participants scoring high on IU more frequently chose the immediate, less probable, and less valuable reward after a trial in which they chose, but not won, the delayed more probable and valuable reward. As the use of a nonclinical sample of unselected, undergraduate students limits the generalizability of their results, we explored how IU might be related to decision-making behavior in a sample of 20 patients with generalized anxiety disorder (GAD), compared with 20 matched controls from the general population. Patients were recruited at a community mental health center at which they sought assessment and treatment (M age = 31.85, SD = 9.76, range: 18–53; 65% female). The healthy control group was matched on gender, educational level, and age (M age = 31.85, SD = 9.78, range: 18–52; 65% female). They were recruited through advertisements on the internet.

An adapted version of the decision making task designed by Luhmann et al. (2011) was used to assess participants' decisions involving simple choices between two small monetary rewards, varying both in probability of receiving the first reward (i.e., 30, 50 or 70% chance of winning), magnitude of the reward (5 or 10 cents), and time to wait before learning the consequences of the choice (i.e., after 4, 7, 11 or 16 s). Participants were instructed to choose (1) the chance to potentially obtain the first reward (i.e., 5 cents) immediately (30, 50 or 70% chance of winning), or (2) waiting for the second reward, which had a higher chance (80%) of obtaining a larger reward (i.e., 10 cents). Thus, in order to win as much money as possible, it was always in the participants' best financial interest to wait for the second reward. Importantly, we also manipulated whether the participant knew how long waiting time was or not ("Time" versus "No time" trials) to further examine the effects of uncertainty. In the "No Time" block decision

making under uncertainty could be estimated, as the probability of obtaining the reward was always higher when participants waited for the second option. As the amount of the reward, probability of winning it, and waiting time were all known to the participants in the "Time" block, decision making under risk could be assessed. As the delays for the second reward varied according to a truncated exponential distribution between 4 and 16 s (as in the task of Luhmann et al., 2011) and participants were explicitly told they could not finish the task faster by consistently selecting the first reward, choosing the first reward could not reflect (1) a wish to complete the task more quickly, (2) a desire to complete more trials, or (3) an aversion of waiting per se. Accordingly, selecting the first choice (with a lower probability of obtaining a smaller reward) can be explained as an aversion to wait in a state of uncertainty.

This study yielded two main results. One primary finding was that GAD patients, but not control participants, tended to avoid uncertainty when risks were low (i.e., only a small difference in probability of winning the reward between the immediate and the delayed reward). However, there was less of a difference in probability of waiting per trial type (30%, 50%, or 70%) in the trials where the patients knew the time they had to wait than in the trials where they did not know how long they had to wait. This suggests that when uncertainty is lower (i.e., waiting time is known), GAD patients are inclined to react more like healthy controls. Furthermore, results showed that both patients with GAD and healthy controls were sensitive to loss, although results suggested that this finding was mainly driven by patients. That is, participants were inclined to choose the immediate but less valuable and less probable reward, when they waited and lost on the previous trial. This inclination to choose an immediate reward after a loss suggests an avoidance of IU, especially in patients with GAD.

Our findings largely support the results of the Luhmann et al. (2011), showing that high IU is not only associated with an aversion to wait in a state of uncertainty, and predicts greater sensitivity to unfavorable outcomes in a subclinical population, but also in a clinical sample of patients with GAD. However, our results also showed that when uncertainty was lower (i.e., known waiting time), GAD patients are more inclined to prefer the most logical option by waiting for the safer but delayed rewards.

Conflicts of interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2019.05.031.

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