RESEARCH SYNOPSIS

Turner, N., Horton, K. D., & Fritz, B. (2009). The relationship between explicit and implicit learning processes and probable pathological gambling. *International Gambling Studies, 9*(3), 245-262. doi:10.1080/14459790903286584

RESEARCH QUESTIONS

Are gamblers influenced by implicit learning biases? Or do they use explicit strategies during game play?

PURPOSE

Although implicit learning (unconscious) is adaptive in most circumstances, it can be maladaptive if associated with fluke events (e.g., gambling). Alternatively, explicit learning (conscious) strategies can overcome implicit learning if the gambler is actively trying out new strategies. The purpose of this study was to determine whether implicit or explicit learning is related to pathological gambling.

HYPOTHESIS

The hypotheses were threefold: (1) people participating in gambling-like tasks for which the outcome was biased would learn the bias and respond according to the bias; (2) probable pathological gamblers (PGs) would differ from non-pathological gamblers (NPGs) in terms of how often they follow the learned bias during the extinction phase – if PGs follow the learned bias more then it would suggest that they are strongly conditioned, while if they follow the learned bias less then it would suggest they are actively seeking out new strategies; and (3) PGs would differ from NPGs in the learning the artificial grammar and will differ in how often they repeat errors – greater repetition indicates seeking strategies, less repetition indicates learning bias.

PARTICIPANTS

The sample contained 167 participants recruited from Wilfrid Laurier University (N = 80; 44.8% males; mean age of 22.6 years) and Center for Addiction and Mental Health (N = 87; 47.5% males; mean age of 32.1 years).

PROCEDURE

Participants performed a laboratory gambling-like tasks that examined pattern learning. The first two experiments (mini-roulette and the lottery task) were based on probability learning that included a learning phase in which a bias in favour of one type of response was programmed into the computer and an extinction-test phase in which the bias was no longer present. The third experiment was an artificial grammar learning task that included learning and recognition phases.

MAIN OUTCOME MEASURES

Demographics were collected via a questionnaire and gambling severity assessed with the South Oaks Gambling Screen (SOGS) and DSM-IV-TR. The mini roulette task assessed probability learning in three conditions - streaks, no streaks, and control (no learning) conditions. The measures included: frequency of copying the previous winning colour, the relationship of actual streaks to betting on streaks, bet size, and keeping with the bias during the extinction phase. The lottery task also assessed probability learning and measured frequency of selecting a ticket with a repeated number and keeping with the bias during the extinction phase. The artificial grammar task included a learning task and recognition test that measured recognition accuracy, response bias, and number of times the same error was made during the recognition test.

KEY RESULTS

The results showed participants learned the probability bias and responded accordingly (consistent with hypothesis 1). For the mini-roulette task, participants bet on the colour that won in the trial prior during the streaks condition, but not during the no-streaks or control conditions; and the lottery task showed repeated behaviour with ticket numbers. The results did not demonstrate a significant difference between PGs and NPGs during the extinction trials, however PGs seemed to abandon the learned bias sooner than NPGs. Consistent with hypothesis 3, the results for the artificial grammar task showed that PGs made significantly more repeated errors than NPGs. PGs were also found to escalate their bet size from the sixth trial onwards.

LIMITATIONS

First, the study was laboratory-based and participants played for winning rather than risking their own money, which lacks ecological validity and generalizability. Second, there were no data on the strategies participants used.

CONCLUSIONS

The findings from this study suggest that if an apparent trend occurred by random chance during a game, that some gamblers may learn to respond as if that trend predicted the outcome of the game. Furthermore, PGs are more likely to abandon their bias strategy once the bias was removed, whereas NPGs continue to follow the learned bias. For PGs, when the bias stopped predicting wins, they sought out new strategies. Lastly, the repeated errors in the artificial grammar task suggested that PGs used more explicit learning strategies than implicit learning.

KEYWORDS: learning, erroneous belief, gambling, Bias, addictive behavior, strategy

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