

Participant Awareness During the Iowa Gambling Task

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The Iowa Gambling Task

In the IGT, participants sequentially select 100 cards from four decks. Unbeknownst to participants, the two decks with higher gains (\$100) also have losses (net -\$250 over ten draws), whereas the two decks with lower gains (\$50) have net gains (net + \$250 over ten draws). Thus, the challenge is for participants to avoid choosing high gain, high loss decks and instead choose low gain, low loss decks, which results in overall gains instead of overall losses.

Initial Gain Per Draw	Deck A	Deck B	Deck C	Deck D
+\$100	+\$100	+\$100	+\$50	+\$50
-\$250	-\$250	-\$250	+\$250	+\$250
Net Result over 10 draws				

Net scores $[(C+D) - (A+B)]$ are calculated by adding the number of 'good' deck selections (C & D) then subtracting the number of summed 'bad' decks selections (A & B). Thus positive net scores are associated with good choices and negative net scores are associated with bad choices.

Figure 1: Comparing Behavioral Choices with Subjective Ratings

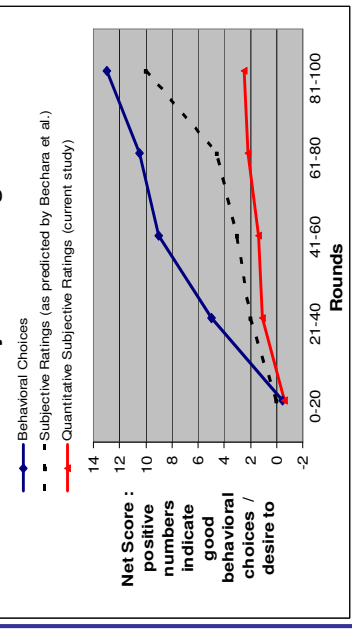
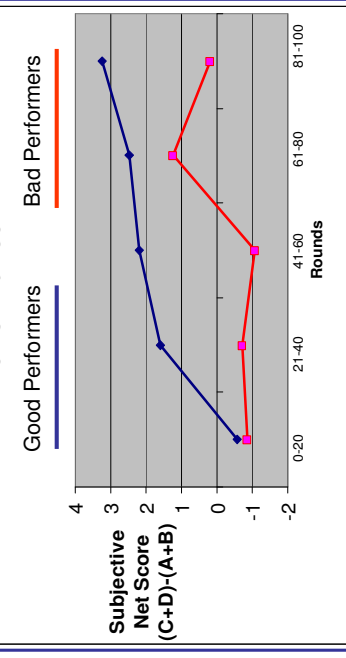


Figure 2: Subjective Ratings by IGT Performance



Introduction

The somatic-marker hypothesis (Damasio, 1994) proposes that bodily reactions to environmental stimuli influence cognition and decision making. Support for the somatic-marker hypothesis was argued to be provided by the finding that healthy participants doing the Iowa Gambling Task (IGT; Bechara, Damasio, Tranel, & Damasio, 1997), while unable to identify which choices were advantageous nonetheless chose advantageously. Furthermore, the participants displayed higher galvanic skin responses when pondering high-risk choices as compared to low-risk choices. This evidence suggests that participants choose good decks before they develop a strategy for identifying which decks may be good.

The current research seeks to quantify results obtained by Bechara et al. (1997) in which participant responses to open-ended questions reveal a gradually increasing awareness of the IGT. Of particular interest is whether or not participants are able to make advantageous choices prior to their awareness of the nature of the task and what strategies may be employed.

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Method

In the control condition the participants performed the standard protocol of the IGT. Participants in the experimental condition did the standard protocol of the IGT as well as provided subjective evaluations about how much they would like to draw from each deck prior to each draw. This method allowed a quantitative measure of the subjective awareness of how much participants found draws from each deck to be desirable. Specifically, participants were asked to rate how much they wanted to draw from each deck on a 10-point scale, anchored at 1 (*Do not want to choose a card from this deck*) and 10 (*Want very much to choose a card from this deck*). By using a 1-10 scale it was possible to employ the standard scoring system used by Bechara et al. (1997) $[(C + D) - (A + B)]$ thus allowing a meaningful comparison between behavioral choice and subjective evaluation. Since both scales have a minimum of -20 and maximum of 20, deck selection (good or bad) can be easily evaluated in light of deck preference (good or bad).

Results

According to Bechara et al. (1997), one would expect participants to choose advantageously prior to being able to identify 'good decks' (see figure 1: behavioral choices vs. predicated by Bechara). This subjective lag would provide evidence in favor of the somatic marker hypothesis, specifically, that participants were using bodily reactions rather than conscious awareness to select decks. Results from the current study reveal that over the course of the task participants were unable to clearly indicate which decks were better choices (as illustrated by low subjective ratings in round 5 for current study).

When subjective awareness is looked at by participant performance, we see that those participants who performed poorly (net loss at end) responded such that they wanted to choose 'bad' decks while those who performed well (net gain at end) tended to respond that they wanted to choose 'good' decks. (see figure 2).

Conclusion

Participants, though able to make advantageous draws, did not indicate a strong awareness as to which decks were advantageous. Bechara's qualitative data suggest overall participant awareness by task completion (by round 5, Net Score = + 10). In the current study, by task completion, participants were not indicating awareness, as assessed by their desire to choose 'good' decks (by round 5, Net Score = + 2.5). Examination of this discrepancy may offer a better understanding of task awareness.

A breakdown of subjective ratings by performance may provide insight into differing strategies used in the IGT. As figure 2 illustrates, participants seemed to be choosing the decks they wanted, whether profitable or not. A larger sample, having more participants with both net gains and net losses at task end, may illuminate any differences in deck desirability and participant strategy. Those participants selecting the good decks may have taken note of Deck A & D's large monetary punishment and opted with the 'avoid large losses' strategy while those selecting bad decks may be driven by Deck A & B's big profits and consequently decided to 'seek large gains'. In the case of the IGT, the strategy being employed should certainly have implications for deck selection as well as subjective feelings associated with drawing from a deck.