Special Session Summary    Faulty Reasoning and Gambling Behavior

Joseph Goodman, University of Texas at Austin

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SESSION OVERVIEW

According to the National Gambling Impact Study Commission, 86% of Americans report gambling in their lifetime and 68% report gambling in the last year (Seligman 2003). In other words, although gambling is an addiction for some, most gambling involves normal consumers who simply choose to engage in the activity even though it does not make sense rationally (i.e., the expected value is negative). The involvement of normal consumers in the patentedly “non-rational” act of gambling has led to the use of gambling as a fertile context, both for identification and for testing of such robust deviations from normative behaviors as preference reversals (Lichtenstein and Slovic 1973), the illusion of control (Langer 1975) and gambler’s fallacy (e.g., Tversky and Kahneman 1974).

This special session probed deeper into this body of knowledge in several significant ways. First, the session identified some—hitherto unidentified—factors that play a significant role in preference and choice among gamblers. In the tradition of previous literature in the area (briefly mentioned above), the session noted deviations from normative behaviors across all three presentations, and also explored the psychological factors that underlie these deviations. The final presentation also assessed whether, and to what extent, the biases exhibited in a gambling context translate to analogous biases in other consumer contexts. In summary, the special session extended previous research in consumer gambling and decision making in both theoretically and substantively meaningful ways.

The first two presentations identified factors that motivate “normal” individuals to engage in gambling behavior. The first study investigated how ordinary consumers often find themselves stuck gambling past when they should. Raghu Nathan and ter Hofstede, argue that a crucial element contributing to this flaw is gambler’s faulty intuitions about the effect their “stopping” rules have on the expected values of their gambling sessions. On the basis of a survey conducted by the authors in Las Vegas, using real gamblers as respondents, the authors report that gamblers are prepared to stop a gambling session if they make a “Target” amount of money (which may be preset or evolve as the session progresses), or if they lose all their “budgeted” money. Unfortunately (for the gamblers), the Target amount is often set unrealistically high—even on average, sixteen times the initial outlay (the amount of money they brought into the gambling session). Because the number of plays required to meet such unrealistically high Targets is generally quite large, most gamblers lose all their money in their quest for the elusive Target. Two controlled experiments, conducted subsequently using undergraduate subjects, focused on gamblers’ intuitions about whether and to what extent pre-specified Targets influence outcomes of gambles. Results from these experiments indicated that gamblers tend to underweight the deterrent effect of an unrealistically high target amount.

In the second presentation, Goodman and Irwin identified which factors lead individuals to attach importance to, what they term, “special random numbers” in a gambling task, such as a lottery. Previous research has shown that gamblers prefer numbers they choose themselves because they believe this choice helps them control the outcome. They identified other conditions under which people find numbers “special” (i.e., worthy of betting more on than other numbers) but that they do not choose. By manipulating task type and assigning participants a number by an endogenous system outside one’s own control (as is done in numerology, astrology, and other paranormal systems), they find that people prefer some numbers that they do not control and that the mechanism underlying this preference is enjoyment with the task. The enjoyment associated with this “specialness” stems from the prevalence of certain systems (i.e., dates and names) in the fortune telling world. They replicated these findings using actual money and show that this prevalence-to-enjoyment link already exists in memory for prevalent systems and is activated and strengthened by priming similar prevalent systems, such as astrology.

While the first two presentations focused on departures from normative behaviors exhibited by “normal” people, the third, by Cole, Denburg, and Bechara, identified neurological explanations for biases by examining gambling behavior of subjects with brain lesions. Based on the finding that people with damaged prefrontal lobes are especially susceptible to gambling biases in the Iowa Gambling Task, they assess whether gamblers who make poor (vs. good) decisions have similarly impaired functioning in the prefrontal lobe, and whether this defect also causes them to behave in a non-rational fashion in other contexts. Consistent with their thesis, they find that compared to good gamblers, bad gamblers and older consumers are more likely to be enthusiastic about deceptively advertised products and services, such as mutual funds.

References

“Faulty Reasoning Factors Underlying the Gambler’s Ruin”
Rajagopal Raghu Nathan, University of Texas at Austin
Frenkel ter Hofstede, University of Texas at Austin

Suppose a person has $50 to gamble and is offered two types of gambling games (Game A and Game B) depicted in the boxes below. Rules of both games state that one cannot quit gambling until one has reached a pre-specified Target amount (or has lost the $50), and that one should quit once the Target is achieved. Which game should one choose?

<table>
<thead>
<tr>
<th>Game A</th>
<th>Game B</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ per bet: $5</td>
<td>$ per bet: $5</td>
</tr>
<tr>
<td>P(winning) = .48</td>
<td>P(winning) = .49</td>
</tr>
<tr>
<td>P(losing) = .52</td>
<td>P(losing) = .51</td>
</tr>
<tr>
<td>Target = $100</td>
<td>Target = $500</td>
</tr>
</tbody>
</table>
A risk-neutral decision-maker should choose Game A over Game B, as the former has higher expected value (-19.2 and -45.15, respectively). Results from a survey and an experiment, however, suggest that people generally tend to prefer Game B. This preference appears to be driven not by risk-seeking (which would provide a “rational” explanation for such choice), but rather, by a bias generated by a disproportionately heavy focus on the probabilities associated with winning vs. losing (which favors Game B). While it is true that probabilities of winning vs. losing can significantly affect the overall outcome of games (and should hence be considered in evaluating gambles), a more subtle factor, viz., the number of plays required to reach the Target can also play an important role. Specifically, it can be shown that, for a sufficiently high Target, the odds that a gambler will reach a state of zero wealth is greater than that of reaching the Target—even if the probability of winning were greater than the probability of losing. Stated formally, all else being equal, the higher the Target, the greater the chance that the gambler will reach a state of zero wealth first (before reaching the Target) and hence, if the objective were to maximize expected value, the gambler may be better off choosing a gamble that is associated with lower probabilities of winning.

The harmful impact of an unreasonably high Target on the overall outcome of gambles (mediated by the number of plays required to reach the Target) was revealed in a survey conducted in a Las Vegas casino. On average, respondents indicated that they would quit playing if they reached a target amount equal to sixteen times their initial outlay. Because the number of plays required to meet such unrealistically high Targets is generally quite large, most gamblers lose all their money in their quest for the elusive Target, and can hence no longer play.

In an experiment, we asked participants to choose between two gambles, similar to the ones displayed on the previous page. Consistent with our predictions, participants’ preferences displayed faulty intuitions about the effect unrealistically high Targets have on the overall probability of attaining them. We assessed the size of the bias (difference between perceived and actual expected values) in a second experiment. Results revealed that the bias increases with increases in the Target amount, suggesting that gambles which use higher Targets as the stopping rule are actually more attractive than those that use a lower Target amount as the stopping rule.

Gamblers may not necessarily have a fixed Target amount in mind before they start gambling, but instead, construct and adapt their Target during the course of gambling. Interestingly, our experiment indicates that, regardless of whether the initial series of plays results in losses or in gains, gamblers decide to continue to play. Those on a losing streak justify their decision to continue by “expecting to win” (cf. gambler’s fallacy; e.g., Clotfelter and Cook 1993). Those on a winning streak continue to gamble because they “feel lucky” and hold unrealistically optimistic visions of the future (cf. Taylor and Brown 1988).

In many gambling situations, the decision maker picks a number or symbol in order to potentially win money via a random system. A purely mathematical view of random gambling systems would presuppose that, given the presumed goal of maximizing the probability of winning, there is no reason to prefer one number (such as those chosen for a lottery ticket or a number on a roulette wheel) over another because the expected value stays constant over all possible choices. Research has repeatedly shown, however, that even within a random system decision makers prefer numbers they pick themselves to randomly-chosen numbers (Langer 1975; Langer & Roth 1975; Wortman 1975). This preference is reflected in actual lotteries. A significant number (approximately 30%) of state lottery players expend the extra effort to choose their own numbers rather than have the computer pick the numbers for them (MUSL 2003).

Previous research (e.g., Langer 1975) on special random numbers has concentrated on numbers one chooses oneself. The “illusion of control” induced by choice appears to be quite robust, although some variables such as repeated gambles can moderate it (see Thompson, Armstrong and Thomas, 1998, for a review). But, we noticed, there are many uncontrollable systems (e.g., numerology, astrology) that also hold appeal for people and there is anecdotal evidence as well. The “Kabalarians,” for instance, will (for a fee) provide an in depth analysis of your name with the promise to free believers of “economic slavery” (www.kabalarians.com). Similarly, many books and websites promise to guide people’s lives through astrology.

We test the monetary appeal of a set of “Numerology Luck Codes” that are not controlled by participants but that vary on a number of other parameters. We test this by measuring the difference in willingness to bet (and/or willingness to pay for a bet) across random number systems, as is done in previous literature (e.g., Langer 1975). We show that (1) this difference obtains even when the illusion of control is not present, (2) this difference can be predicted by other factors, including enjoyment and the prevalence of the particular random number system in society, and (3) this difference increases when priming positive associations in consumers’ memories.

In our first two studies we find that numbers generated randomly by certain systems (e.g., dates and names via numerology) are preferred to gambles of equal expected values and equal (lack of) control. In mediation tests we show that the mechanism underlying this preference is enjoyment, not perceived control. In a third study we directly measure the prevalence of the more popular random number systems, and show that those for which people will bet more are also are more prevalent in society. The fourth study uses real money and we prime a prevalent fortune system (i.e., astrology). We find that the prime increases the impact of enjoyment on the willingness to bet difference, suggesting that decision makers have positive associations in memory between some random systems and fortune-telling systems that are prevalent in society. The enjoyment, perhaps stemming from childhood memories, is primed by the random system, and because of this enjoyment the gamble becomes more enjoyable to play. Furthermore, this prevalence (not beliefs about luck, or individuality of the system) underlies preference for these random numbers. Our findings help expand the concept of special random numbers beyond the illusion of control, and help provide both theoretical and practical guidance to researchers attempting to understand, capitalize on, or prevent investment in special random numbers in the gambling environment.

References

“Faulty Reasoning about Randomness: Special Random Numbers”
Joseph K. Goodman, University of Texas at Austin
Julie R. Irwin, University of Texas at Austin
"Bad Gamblers: Using Negative Performance on the Iowa Gambling Task to Predict Future Consumer Mistakes"

Catherine Cole, University of Iowa
Natalie Denburg, University of Iowa
Antoine bechara, University of Iowa

The Iowa Gambling Task is a task that resembles real-life decision making in the way it factors in reward, punishment, and unpredictability. The object of the game is to win money by picking from the best of four decks of playing cards. Each participant gradually acquires knowledge about which decks are “good” and which are “bad” as the player removes card after card from varied decks. Some cards lead to financial rewards; others lead to penalties. Normal gamblers begin choosing consistently from the “good” decks, and begin avoiding the “bad” decks even though they cannot consciously articulate the strategy they are using to deal with the situation. But those participants with impaired prefrontal lobes seem unable to distinguish between the “good” and the “bad” decks and lose the game because they continue to choose from decks that put them into increasingly greater levels of debt.

In our research, older and younger adults come to the Department of Neurology Laboratory to perform the gambling task. Based on the neurological aspects, we classify older and younger adults as good and bad gamblers and expose them to an advertising booklet containing a combination of deceptive and non-deceptive ads.

Half the consumers are exposed to a Mutual Fund ad that visually shows only the last 6 weeks of performance in an upward trajectory, half the consumers are exposed to the same ad that visually shows a 6-month performance history with more variability in performance. We then ask consumers a series of questions about the ads. About the Mutual Fund, we ask consumers to indicate the following: 1) what is that probability that they would invest in the Mutual Fund, 2) how much they would initially invest in the mutual fund, 3) the likelihood that the Mutual Fund will give an above average return during the next year. Finally, participants indicate how important the average rate of return is to them in deciding: a) whether to invest, b) the likelihood that there will be major fluctuation in the rate of return over the next few years, and c) the importance of this fluctuating return.

On all measures of responses, we find, as would be expected, that all consumers are less enthusiastic about the mutual fund when it is not advertised deceptively. Most importantly, we also find that the bad gamblers are more likely to be enthusiastic about the mutual fund and believe advertisers’ claims when it is advertised deceptively compared to the good gamblers. Older adults are also susceptible to the deceptive advertisements, but only if they are also bad gamblers. The study suggests a fundamental decision making process may be responsible for this behavior in bad gamblers and it can impact other financial and risk-based consumer decisions.