

The Effects of Desire for Control in Situations with Chance-Determined Outcomes: Gambling Behavior in Lotto and Bingo Players

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Two experiments were conducted to examine in field settings how individual differences in desire for control affect behavior in situations with chance-determined outcomes. Experiment 1 found that people high in desire for control were more likely than lows to select their own numbers, rather than rely on a machine-selection option, when playing the California Lotto game. Experiment 2 found that low desire for control people playing legalized bingo were more likely than highs to rely on superstitious behavior and to believe that such behavior affected the game's outcome. Although a low desire for control was associated with more gambling in the lotto game, more frequent bingo playing was associated with a higher desire for control. © 1991 Academic Press, Inc.

More than a decade of research on individual differences in desire for control indicates that this personality variable is related to a large number of behaviors of interest to social and clinical psychologists (cf. Burger, 1991). For example, people with a high need to feel in control of the events in their lives are higher achievers (Burger, 1985), more susceptible to depression (Burger, 1984), more likely to exhibit a Type A interactive style (Dembroski, MacDougall, & Musante, 1984), and less likely to conform to a perceived norm (Burger, 1987) than people low in this need.

In general, this research indicates that high desire for control people are more likely than lows to exercise control when given that option and to respond more strongly when their attempts to control events are frustrated. The present set of studies is concerned with how desire for control affects behavior in a situation in which no control is possible. That is, what happens when high desire for control people confront a situation with outcomes that are chance-determined, such as when rolling dice or guessing winning numbers in a random drawing? At first glance we might

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expect that individual differences in desire for control would have no effect on behavior in these types of situations, except perhaps that they would have little appeal for people with a high need for control. However, past research indicates that this may not be the case. Most of this research has focused on how much people bet in chance-determined games or how much confidence they have in their bets. This work began with the observation that people high in desire for control are more susceptible to what researchers have called the "illusion of control." The illusion of control occurs when people react to certain chance events as if they were at least partially controllable (Langer, 1975). Researchers have demonstrated that the illusion of control is most likely to occur when a game of chance resembles a skill-determined game. For example, Langer (1975) found that people were more confident that their lottery ticket would win when they were allowed to select the ticket themselves. Although the odds of winning are the same in a chance-determined game like a lottery, the subjects in this experiment perceived that they would somehow be able to pick the winning ticket if allowed to look over the choices and decide on which ticket they wanted.

A series of investigations found that people high in desire for control were more likely to succumb to this illusion of control than those low in this need. Compared to lows, high desire for control subjects bet more when they were allowed to throw the dice in a dice game (Burger & Cooper, 1979), when they knew ahead of time which cards chosen from a deck would lead to prizes (Burger & Schnerring, 1982), when the odds of winning were relatively good (Wolfgang, Zenker & Viscusi, 1984), and when they were familiar with the materials used in the gambling task (Burger, 1986).

This research highlights two ways desire for control may affect behavior. First, the findings suggest high desire for control people may be able to satisfy their need for control simply by convincing themselves they have some control over events, even if this is not the case. However, a closer inspection suggests that this may be only part of the story. High desire for control people do not succumb to the illusion of control in all gambling situations. Rather, they appear more susceptible to this effect only when the situation hints that they might somehow influence the outcome of the game, such as by throwing the dice themselves. This suggests a second process associated with desire for control. That is, compared to lows, high desire for control people may simply be more aware of and more responsive to cues about control. When a chance-determined situation contains elements suggesting control is possible, people with a high desire for control may be more likely to respond to that information than lows. Consistent with this reasoning, Burger (1986) gave false feedback to some subjects indicating that they had done worse than average at guessing

heads or tails on a series of coin tosses. High desire for control subjects were more likely than lows to conclude from this information that they were likely to continue their below-average guessing on an upcoming series of coin tosses. Thus, the high desire for control subjects reacted to the control-relevant information, even when it suggested they would not be able to control the situation and even though objectively the outcome of the event was chance-determined.

We can take this finding one step further to suggest that, given a choice, gamblers with a high desire for control will bet on games that provide them with the greatest sense of control or which actually provide a small element of control over winning and losing. For example, successful betting on horse races or sports events requires an element of knowledge and skill, whereas picking the winning number in roulette does not. Consistent with this expectation, Burger and Smith (1985) found that desire for control was related to the type of game Gamblers Anonymous members reported playing when they had gambled heavily. The gamblers high in desire for control had been more likely to bet on events that hinted at an illusion of control (poker, horse racing) than games that appeared to be strictly chance (casino games).

The present set of studies was conducted to examine further how individual differences in desire for control affects behavior in situations with chance-determined outcomes. We were particularly interested in examining this relationship outside of the laboratory. There may be important differences between the simulated gambling situations used in the laboratory experiments described earlier and real gambling situations in which players choose to participate and stand to win or lose real money. Thus, we examined behavior in two gambling situations that are legal in the state of California, where the research was conducted. First, we surveyed people who had just finished playing the California Lotto game. Next, we looked at behavior among people playing legalized bingo for money. We expected that people high in desire for control would exhibit behaviors that would enhance their perception of control over the game and that people low in desire for control would engage in behaviors that would reduce their perceived level of control but enhance their perceived chances of winning.

EXPERIMENT 1

The California Lotto drawing is held each Wednesday and Saturday evening. Players pay one dollar to select six numbers from 1 to 49. Adults can make their selections at participating retail outlets via a computer network. People can play as many times as they wish, paying one dollar per entry. If the player's six numbers match the six selected in the next drawing, the player wins the jackpot which typically is worth several

million dollars. Smaller prizes are awarded for selecting five, four, and three correct numbers. The odds of selecting all six numbers are 1 in 13,983,816.

There are two ways to select numbers for the lotto game. Players can choose their own six numbers based on whatever lucky formulas or intuition they can, or they can use the Quick Pick procedure. Players who use the Quick Pick procedure indicate that they want the computer to randomly select six numbers for them.

How might desire for control affect this selection? Past research suggests that high desire for control people tend to select options that are most likely to enhance their sense of control (Burger, McWard, & LaTorre, 1989), and in particular that high desire for control gamblers prefer games that suggest some control over winning and losing is possible (Burger & Smith, 1985). Consequently, we predicted that high desire for control players would be more likely to use the self-selection option than the Quick-Pick method when playing lotto. Although the chances of winning are in reality no better with either procedure, choosing one's own numbers may satisfy some players' needs to perceive that this event is at least a little under their control.

Method

Subjects. Sixty adults who had just finished playing the California Lotto game participated as subjects. Subjects were offered a free \$1.00 lottery ticket ("scratcher") for their participation. Two subjects were dropped from the study because they did not complete the questionnaire, leaving 58 in the final sample.

Procedure. Researchers approached adult customers leaving one of four convenience stores before the lotto drawing on Wednesday and Saturday afternoons and evenings. All four convenience stores were located in the suburban area surrounding Santa Clara University. Researchers asked the customers if they had played the lotto game that day. Those who said they had (approximately half) were then offered a one-dollar lottery ticket to complete the two-page questionnaire. The lottery ticket is part of a different legalized gambling game in California. Players scratch off a coating to determine immediately if they have purchased a winning ticket. Approximately 80 percent of those who had played lotto agreed to be part of the study.

The questionnaire asked subjects if they had chosen the lotto numbers themselves, used the Quick Pick method, or had done both. Next, we asked subjects a few questions designed to help us interpret the predicted finding. Subjects were asked to estimate how much money they had spent playing lotto during the past month. The questionnaire also asked them to indicate how likely they thought it was "that you will win a lot of money playing Lotto." Subjects indicated their responses by checking one of five statements, ranging from "I think I will win someday" to "I don't think I will ever win." The items were arranged to approximate a 5-point interval scale. Finally, subjects were asked to complete the Desirability of Control (DC) Scale (Burger & Cooper, 1979). The DC Scale is a 20-item self-report inventory that asks subjects to indicate on 7-point scales the extent to which each item describes them. Research has demonstrated reasonable reliability and discriminant validity from social desirability and locus of control measures (Burger, 1991; Burger & Cooper, 1979).

TABLE 1
DC SCORES AS A FUNCTION OF LOTTO CATEGORY

	Chose own numbers	Both	Quick Pick
DC score	111.95	103.29	98.65
Number of subjects	21	14	23

Results and Discussion

Subjects were divided into three groups, depending on which lotto option they had used that day: picking their own numbers, using the Quick-Pick method, or both. We then compared the average DC score for subjects falling into each of these three categories. As shown in Table 1, these scores differed significantly as a function of category, $F(2, 55) = 4.95, p < .02$. As expected, people who selected their own numbers had significantly higher DC scores than those who used the Quick-Pick method, Newman-Keuls test, $p < .01$.

Subjects' DC scores also were correlated with the amount of money they reported spending on the lotto game during the past month. A significant negative correlation was found, $r(58) = -.23, p < .05$, indicating that higher levels of desire for control were related to lower amounts of money spent playing lotto. Next, DC scores were correlated with the subjects' responses to the item asking how likely they thought they were to win a lot of money playing lotto someday. A nonsignificant positive correlation was found, $r(58) = .11, p < .20$. Although higher scores indicated a decreased perception of winning, the relationship was weak.

The findings are consistent with the predictions. High desire for control people who play the lotto game are more likely to select the playing option that provides them with a sense of some personal control over the outcome, albeit an illusionary one. However, these subjects did not appear so carried away with this illusion of control that they bet excessively. Indeed, they showed more prudence than the low desire for control subjects who reported betting more money on the lotto game during the previous month.

This last finding appears to contradict laboratory studies that find high desire for control subjects bet more in simulated gambling situations. As described earlier, this may reflect some of the important differences between real lotto players and laboratory game players. We might conclude from the Experiment 1 findings that whereas high desire for control people are more likely to select the lotto option that best satisfies their need for

control, the illusion of control is not so strong as to overcome good judgment about how much money to invest in the game.

EXPERIMENT 2

Experiment 1 results suggest that lotto players with a high desire for control tend to create a sense of some control over a situation for which no control is possible. Experiment 2 was designed to examine the opposite effect—relinquishing control to a more powerful source. More specifically, we were interested in the use of superstitious behavior in situations with chance-determined outcomes.

We examined superstitious behavior during legalized bingo games. There is virtually nothing about bingo games that might generate an illusion of control. In the bingo parlors we observed, the cards came in prewrapped packages and the numbers were selected by the people running the game. However, casual observation of these games indicated that a large number of participants engage in superstitious behavior. Many brought good-luck charms, sat in lucky seats, wore lucky clothes, and so on.

How does this behavior relate to perceptions of control? At one level, we might say that these people are attempting to exercise control over the game's outcome. However, superstitious behavior may also be thought of as tantamount to relinquishing control over the outcome of the game to some superior external force, as represented by a lucky charm or lucky day of the week. We have argued elsewhere that people often relinquish control to another source when they believe this action will lead to a more desirable outcome (Burger, 1989; Burger et al., 1989). However, such behavior does not instill a sense of personal control. Indeed, we found that high desire for control subjects were more likely than lows to retain personal control over the administration of a blood sample rather than relinquish control over that task to a more experienced experimenter (Burger et al., 1989). The high desire for control subjects in that study were best able to satisfy their need for control by doing the sampling themselves.

We would predict from this analysis that people low in desire for control would be more likely than highs to exhibit superstitious behavior when playing bingo. In a sense, this prediction is similar to the behavior observed in Experiment 1. Low desire for control subjects in that study were more likely than highs to relinquish the choice of their numbers to the machine. We also expected that low desire for control would be associated with a greater belief that the good-luck charms and other superstitious actions actually affected the outcome of the game.

Method

Subjects. Fifty-two adults attending one of three bingo parlors participated in the study. Six of these people had to be dropped from the study because they did not complete the questionnaire correctly. These dropped subjects either did not understand how to respond to the 7-point response options on the DC Scale or skipped several of the DC Scale items. The 46 subjects who remained included 34 females and 12 males. Their ages ranged from 20 to 71, with an average age of 50.7 years.

Procedure. The experimenter approached people attending an evening session of bingo at one of three locations. After the players had purchased their bingo cards but before the games began, the experimenter asked players if they would like to participate in the study. Approximately two-thirds of the players approached agreed to participate.

Subjects were asked to complete an anonymous questionnaire. The first item on the questionnaire asked subjects to estimate how many times they had gone to that or any other legal location to play bingo during the past month. Next, subjects were asked if there was "anything you do to help yourself win at bingo, such as bring good-luck charms, read books on how to win, or wear lucky clothes?" Those who answered yes to this question were then asked to list all of the things they did to help themselves win at bingo. In addition, these subjects were asked to indicate the extent to which they believed these behaviors helped them win. Subjects responded to this last item by checking one of six statements, ranging from "All the time" to "Not at all." The items were arranged to approximate an interval 6-point scale. All subjects then completed the DC Scale. Finally, the questionnaire asked subjects to indicate their age and gender.

Results and Discussion

Nineteen of the 46 subjects (41.3%) indicated that they engaged in some sort of behavior to increase their chances of winning at bingo. We compared the DC scores for these subjects with the scores for those who did not engage in this behavior. As predicted, those who engaged in some sort of superstitious behavior had DC scores that were significantly lower than subjects who did not engage in this behavior, $M = 95.53$ and 104.56 , respectively, $t(45) = 2.04$, $p < .05$.

Next, we looked at only those subjects who indicated that they engaged in some superstitious behavior. We compared these subjects' DC scores with the number of superstitious behaviors they listed. A negative correlation was found, $r(19) = -.33$, $p < .08$, with a larger number of superstitious behaviors associated with lower DC scores, albeit falling short of statistical significance. Finally, we compared these subjects' DC scores with the extent to which they believed the behavior helped them win. Subjects' responses to the 6-point scale were negatively correlated with DC scores, $r(19) = -.43$, $p < .03$, indicating that lower DC scores were associated with a stronger belief that the behaviors helped.

Finally, subjects' scores on the DC Scale were correlated with the number of times they reported playing bingo during the past month. These two scores correlated significantly, $r = .30$, $p < .02$. In contrast to the findings in the first experiment, this correlation indicates that higher DC

scores were associated with a greater amount of bingo playing. Subjects reported playing bingo an average of 13.89 times per month.

GENERAL DISCUSSION

Both experiments demonstrate that desire for control can influence behavior in situations with chance-determined outcomes. High desire for control subjects in Experiment 1 were more likely than lows to select the option that best satisfied their need to feel in control, even though this did not change their chances of winning. In the second experiment, subjects low in desire for control were more likely than highs to relinquish control to an external force, as represented by a good luck charm or lucky piece of clothing. We interpret this latter finding to mean that the high desire for control players were less likely than the lows to go along with this rather common bingo-playing behavior. The high desire for control bingo players apparently would rather play the chance-determined game themselves and take their chances of winning and losing than rely on an external force to help them win. Although playing bingo probably does not provide much if any sense of personal control over the game's outcome, engaging in superstitious behavior is unappealing to those who prefer to see themselves in control of what happens to them.

Examining how desire for control affects behavior in situations with chance-determined outcomes adds to our understanding of how this personality variable affects behavior generally. In the absence of real opportunities to exercise control over an event, people with a high desire for control appear motivated to seek out or create situations to satisfy their need for control, even when that control is illusory. This tendency is complemented by the desire to avoid behaviors, such as the superstitious actions seen in Experiment 2, that would take away from their perception of personal control. Although high desire for control people have been found to respond to control-relevant cues in past studies, the present set of studies indicates that people actively seek out or avoid situations that suggest more or less control as a function of desire for control.

The findings from these two studies also raise the question of how desire for control is related to gambling behavior, and highlight the complexity of this link. Early laboratory studies found that high desire for control subjects bet more than lows in gambling-like situations capable of generating an illusion of control. This suggested that perhaps people high in desire for control are more likely than lows to succumb to the illusion of control built into many gambling situations. However, Burger and Smith (1985) found Gamblers Anonymous members had significantly lower desire for control scores than members of a matched control group. This inconsistency also emerged in the present pair of studies. More gambling was associated with a low desire for control among the lotto players, but

more frequent bingo playing was associated with a high desire for control. Although there are many differences between the situations examined in these studies that might account for the findings, no theoretically linked difference is apparent. However, because perhaps subtle differences in the situation may play a crucial role in this relationship, we suggest that examining real gamblers in real gambling situations probably provides the most fruitful avenue for understanding this link.

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