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Becky L. Nastally
Southern Illinois University

Mark R. Dixon
Southern Illinois University, mdixon@siu.edu

James W. Jackson
Southern Illinois University

THE EFFECT OF STOPPING DEVICES AND WIN RATE ON PREFERENCE IN SLOT MACHINE PLAYERS

Becky L. Nastally, Mark R. Dixon, & James W. Jackson
Southern Illinois University

Using a between-subjects design, we evaluated the effect of structural features of slot machines in the form of stopping buttons and win rate on response allocation to two concurrently available simulated slot machines. Participants were randomly assigned to conditions that consisted of the slot machine with stopping buttons paying out substantially more, less, or equally to a slot machine that did not feature any stopping devices. Results indicated that win rate, rather than presence of stopping devices, played a primary role in determining to which slot machine participants allocated responses.

Keywords: Stopping devices, slot machine play, gambling behavior.

Upon entering any standard casino, perhaps the most salient features of the environment are the slot machines. This is because slot machines often possess a wide range of design characteristics such as sounds, lights, and colors to attract the attention of a potential player. However, the structural features of slot machines, such as stopping buttons or other devices such as bonus spins or advanced levels, have increasingly come under investigation in gambling research (Johnson & Dixon, in press; Ladouceur & Sevigny, 2005). Although these devices have no bearing on the outcome of a spin, previous research has shown that players will often respond as if they do (Parke & Griffiths, 2006). Similar to the more widely researched 'near-miss phenomenon' as it applies to slot machines (Dixon & Schreiber, 2006; Ghezzi, Wilson, & Porter, 2006), structural features such as stopping devices may perpetuate or reinforce responding. Thus, slot machine gambling may be more addictive than other forms of gaming (e.g. table games, lotteries, or betting at the track)that do not feature such devices.

The lure of the slot machines that specifically feature stopping devices may be partly attributed to the illusion of control (Langer, 1975). The illusion of control represents an illogical belief that the outcome of the turn, or spin in this case, is contingent upon some chain of responses emitted by the player. This conceptualization is outlined in a study by Johnson & Dixon (in press) that employed two pathological gamblers as participants. The results showed that participants chose to engage in response options that allowed them to control aspects of the game (i.e., roll the dice at craps, pick the numbers during roulette, or stop the reels on a slot machine) rather than allow a dealer to do these things or refrain from using the stopping devices despite the response cost contingencies associated with control choices (i.e., giving up chips).

Ladouceur & Sevigny (2005) recently conducted a study that focused solely on slot machine stopping devices. Utilizing a between-subjects group design, the researchers found that participants who were exposed to a slot machine with stopping devices played twice as many games as participants in a control group of players who did not have access to these devices. Additionally, participants reported believing that their actions (stopping

Address all correspondence to:
Mark R. Dixon
Behavior Analysis and Therapy Program
Rehabilitation Institute
Southern Illinois University
Carbondale, IL 62901
Email: mdixon@siu.edu

the reels) determined what symbols would appear on the payout line and that using the devices actually increased their chances of winning.

In the present study we sought to extend the findings of Ladouceur & Sevigny (2005) in two ways. First, whereas Ladouceur and Sevigny exposed participants to slot machines in a single operant arrangement, we evaluated the effects of stopping devices in a concurrent operant paradigm to determine preference rather than duration of play. Second, whereas Ladouceur and Sevigny exposed participants to identical win and loss sequences, we evaluated the role that win rate played in the persistence of play on slot machines that featured stopping buttons as compared with those that did not.

METHOD

Participants, Setting, and Reliability

Thirty college graduate students over the age of 18 were recruited to participate through on-line classes in the Rehabilitation Institute. Participants received extra credit for their involvement in the study. Participants' gambling behavior was assessed using the South Oaks Gambling Scale (SOGS) (Lesieur & Blume, 1987) which is the most frequently used questionnaire to determine problematic gambling (Shaffer, Hall, & Vander Bilt, 1999). Scores on the SOGS range from zero to 20, with at least a 5 or more being indicative of a potential pathological gambling problem. Using this criterion, only one participant's score reflected a possible gambling problem and the average SOGS score for the sample was .57.

The entire experiment was computerized and programmed using Visual Basic.NET. We packaged the file into a zip file and attached it to a link posted on the on-line course's website. This made it possible for participants to access and download the experiment to their personal computer allowing data collection at remote locations from the experimenter. This arrangement also resembled internet gambling which typically occurs in the home of the participant. The corresponding data base was highly secure and electronic delivery of the experiment was approved by the university's human subjects research committee. Additionally, a data collection system was built into the programming of the experiment that recorded response allocation, time to complete the study and the demographic information of the participant…….

Design and Procedure

Three conditions were compared in a between-subjects group design. Participants were randomly assigned to one of three experimental conditions: Button Slot Winner, No Button Slot Winner, or Equal Win Rate. Following completion of the computerized version of the SOGS (Lesieur & Blume, 1987), the program provided the following instructions.

"On this screen you will be allowed to play on two slot machines. Slot machine 1 and Slot machine 2 are identical, except that Slot machine 2 has 3 buttons that allow you to stop the slot machine reels when you want to, and on Slot machine 1 they are stopped automatically. You will be given 150 credits to start with and your goal is to finish this study with as many credits as possible. For part of the study you will be required to play on a specific slot machine. Later in the study you can freely switch between the two slot machines at any time by simply clicking on the *Cash Out* button for that slot machine to bring up a choice screen. Good Luck!"

The two simulated slot machines were identical in appearance except that on one machine the stopping buttons were red while on the other machine they were gray and blended into the background of the machine. With both slot machines, the stopping buttons appeared below the reel. By clicking on the

red stopping buttons, the participants were able to stop the wheels on that slot machine. Clicking on gray stopping buttons resulted in no differential consequences as they were not activated.

Participants were first exposed to 40 consecutive forced choice trials to both slot machines (20 per slot machine), the order of which was randomly determined. When the forced choice trials were completed, participants entered a 20 trial phase in which they could freely choose between playing on either of the two slot machines. The win rates of the slot machines varied depending on the experimental condition.

Button Slot Winner. In this condition, the slot machine that featured the stopping buttons was programmed to win 80% of the time and the slot machine with no buttons had a win rate of 10%.

No Button Slot Winner. In this condition, the slot machine with the stopping buttons win rate was programmed at 10% and the slot machine without stopping buttons was programmed to win 80% of the time.

Equal Win Rate. In this condition, both slot machines were programmed to win 30% of the time.

Upon completing the experiment, participants were thanked for their participation and dismissed from the study.

RESULTS AND DISCUSSION

In the Button Slot Winner condition, nine of 10 participants allocated the majority of their responses to the slot machine that featured the activated stopping buttons. During the No Button Slot Winner condition, nine of 10 participants allocated the majority of their responses to the slot machine that did not feature activated stopping buttons. During the Equal Win Rate condition, variable response allocation was observed among participants. 50% of the players chose to play on the slot machine that featured activated stopping buttons the majority of the time. The remaining players in the Equal Win Rate condition allocated responding to the slot machine that did not feature activated stopping buttons.

Figure 1 shows the mean response allocation to the slot machine that featured stopping buttons across the three conditions. The mean percentages for the Button Slot Winner, No Button Slot Winner, and Equal Win Rate conditions were 83.5%, 12%, and 50.3% respectively. A one-way ANOVA was conducted to directly compare the group means, the results of which suggested statistically significant differences (F (2, 27) = 10.122, p = .001). More specifically, Tukey's Post-Hoc analyses revealed significant differences between mean responding of the Button Slot Winner group and the No Button Slot Winner conditions at $p = .000$.

The present investigation produced some interesting findings. First, while the results of Leadouceur and Sevigny (2005) showed that players may play longer on a slot machine that features stopping devices, the current results suggested that players do not necessarily prefer to play on slot machines with stopping devices over those without them when win rates are equal.

Second, the current results suggested that differences in win rate might have been responsible for differences in preference (or non-preference) for slot machines regardless of the presence or absence of activated stopping devices. These results suggest that although illusion of control (Langer, 1975) can often play a role in preference, programmed contingencies, or a history of reinforcement with a particular slot machine, may play a more primary role.

To more directly extend the findings of Ladouceur & Sevigny (2005), future studies should utilize duration of play as a primary dependent measure while manipulating not only the presence of stopping devices, but also win rate. Additionally, future studies should extend the current results by conducting a similar evaluation with pathological

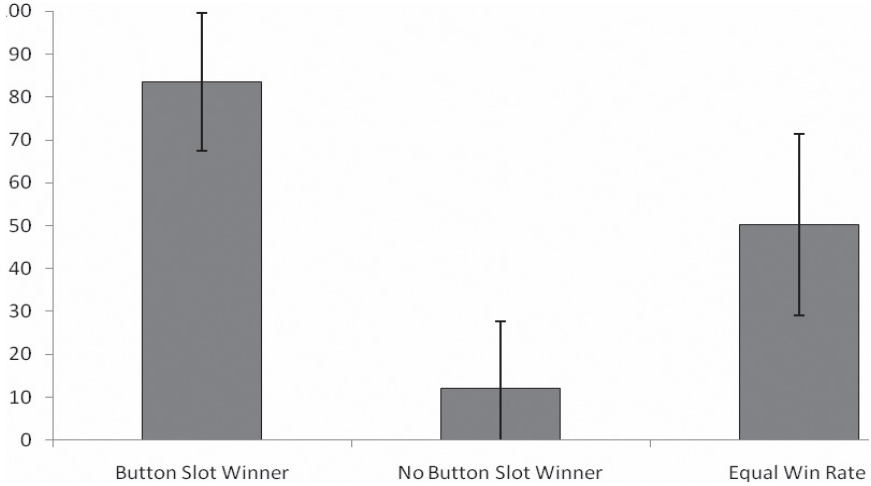

Figure 1. Mean percentage of response allocation to the slot machine with stopping buttons across conditions.

gamblers. Such a study may be of potential importance given the results of previous studies showing differences in the way pathological gamblers respond in controlled experiments (Dixon, Marley, & Jacobs, 2003; Nastally, Dixon, & Jackson, in press). Finally, because the difference in win rates was so dramatic in the current study (80% vs. 10%), future studies should make this difference more conservative (e.g. 70% vs. 30%) to further investigate participants' sensitivity to such programmed contingencies.

The present study sought to investigate the role structural features of slot machines may play in determining how gamblers make choices. The findings indicated that win rate likely plays a primary role in determining slot machine choice among gamblers. It is critical that psychological researchers continue to incorporate many parameters of responding, as well as choice options, so that the complex and potentially damaging behavior of gambling continues to be accurately represented in the laboratory.

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