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USING PERFORMANCE FEEDBACK TO TEACH VIDEO POKER PLAYERS TO GAMBLE BETTER

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The present investigation reports two studies that examined the performance of non-pathological recreational video poker gamblers. In the first experiment, seven participants played three types of video poker games in a within participants randomized sequence design. The percentage of errors made across games revealed the game variant "Deuces Wild" yielded more frequent mistakes than "Jacks or Better" or "Bonus Poker." The second experiment consisted of a new sample of 11 participants being exposed to "Deuces Wild" poker to initially assess error percentages. Next, participants were all provided with performance feedback regarding their play, and finally the feedback was removed to assess performance maintenance. Results suggest that all poker players were able to improve performance above baseline level, and changes were maintained when the intervention was removed.

Key words: gambling, video poker, addiction, performance feedback, video game

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In recent years behavior analysts have become more active in attempting to understand the behavior of gambling and the unfortunate disorder of pathological gambling (e.g., Dixon, Jacobs, & Sanders, 2006; Weatherly & Dixon, 2007; Zlomke & Dixon, 2006). However, similar to the consumption of alcohol or drugs, not all those who partake in such libations develop a problem. Instead, many individuals find themselves capable of managing consumption at healthy levels resulting in no known detrimental consequences from their behavior. The occasional cigar smoker, beer drinker, or wine taster is hardly considered pathological. A similar distinction has been seen in the context of gambling. While reports suggest that over 80% of adults in the United States have gambled in their lives, only 1-3% of the population develops any pathology from gambling (Petry, 2005). For the remaining percentage, gambling may be considered a recreational activity like sports or a type of entertainment (Ghezzi, Lyons, & Dixon, 2000).

Paying more for the same gambling experience is similar to paying extra for movie tickets, sporting events, or a case of beer. Often gamblers do in fact spend more money than necessary due to playing casino games poorly. Casinos profit from the margin of error by patrons. Optimal play will yield a house advantage of only 1-4%. However, when errors are made by players the odds favoring the casino can rise over 500% (Zamzow Software Solutions, 2006). Performance feedback has been successful at improving skills such as the sports of rugby (Mellalieu, Hanton, & O'Brien, 2006), football (Smith & Ward, 2006), and basketball (Kladopoulos & McComas, 2001). To date, the utility of performance feedback has not been demonstrated in minimizing the many type of errors made by recreational gamblers. Thus, the twofold

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purpose of the present study was first to determine the type of video poker game that would yield the most errors by players, and second to attempt to implement a performance feedback intervention to reduce errors by players in the most error-prone game type.

EXPERIMENT 1
METHOD

Participants, Setting, and Apparatus

Seven undergraduate students participated in the current study for course extra credit and a potential $20 gift card to use towards a local retailer awarded upon attaining the highest score among all participants. Participants consisted of 4 men and 3 women between the ages of 21 and 32 (M = 23.4, SD = 3.87). Upon completion of informed consent, participants were asked to complete three computer tasks, the first consisting of a basic demographics form with questions regarding gender, age, highest education level completed, and annual income. The second task consisted of an electronic version of the South Oaks Gambling Screen (SOGS; Lesieur & Blume, 1987). Any individual who scored a 5 or more on this instrument (a measure of potential pathological gambling) was dismissed from the study. Participants were then asked to play three 15 minute sessions of video poker using the video poker software WinPoker 6.0 (Zamzow Software Solutions, 2006). Each session consisted of a different 5-card-draw video poker variation (Jacks or Better, Bonus Poker, and Deuces Wild), and were presented in random order. The three specific games were chosen based on prior research on video poker (Weatherly, Austin, & Farwell, 2007).

Procedure

Prior to running each participant, the experimenter determined the order of presentation of the three video poker games through a random drawing. Upon completion of the demographic questionnaire and the SOGS, participants were given basic instruction on how to play video poker using the computer software. Participants were then staked with 300 credits and allowed to play the first video poker variation for 15 min. Upon completion of the first 15-min session participants were given a 2-min break and asked to leave the room. During this time the experimenter recorded data from the software's session information screen.

The software recorded the number times during the given session that the player deviated from optimal play. Any deviation from optimal play represented either holding a card or failing to hold a card which based on the hand dealt and the payoff structure for the given game resulted in a lower than optimal rate of return. Based on the number of hands played these errors are translated by the software into a Percent Correct Play statistic which was used as the dependent measure in the current study.

After recording the Percent Correct Play statistic, the experimenter reset all statistics to zero, reset the number of credits to 300, and switched the game to the next game variation in the sequence. The participant was then allowed to return and asked to complete another 15-min session playing the new game. These steps were repeated for the remaining game variations, and upon completion of the third 15-min session the participant was debriefed and thanked for his or her participation.

EXPERIMENT 1
RESULTS AND DISCUSSION

The results of Experiment 1 yielded mean Percentage Correct Play for Jacks or Better (M=56.12%, SD = 6.83), Bonus Poker (M= 51.25%, SD = 8.13), and Deuces Wild (M= 41.0%, SD = 8.15). A repeated-measures ANOVA was conducted to support the visual inspection of differences across games and yielded significant mean differences ($F(2, 12) = 9.683$, $p = .003$), and no significance on order of game presentation. The observed dif-

ferences between games supports prior research on poker game error making (Weatherly et al., 2007) that has suggested that players make more mistakes on wild-card games than on non-wild card games. Future research should examine players' relative preference for draw poker games such as Jacks or Better compared to wild card games such as Deuces Wild or other types of wild card games in a concurrent operant paradigm. This type of preparation will allow for analysis of game preference and allow for error types made by players.

EXPERIMENT 2
METHOD

Participants, Setting, and Apparatus

Eleven individuals participated in Experiment 2 for course extra credit and potential $20 gift card. Participants consisted of 1 male and 10 females ranging in age from 22 to 39 (M = 24.8, SD = 4.8). Participants completed an informed consent, demographics questionnaire, and the SOGS as described previously for Experiment 1. No participants scored in the pathological range on the SOGS. Participants were then asked to play a number of 5-min sessions of Deuces Wild video poker on WinPoker 6.0. Deuces Wild was chosen based on results of Experiment 1, which indicated it was the game variant that produced the most errors.

Procedure

Participants were then given basic instructions on playing video poker as described in Experiment 1 and informed that they would be asked to play the game for 5-min sessions, at the end of which the experimenter would ask them to leave the room so that data could be collected. During these breaks between sessions, data were collected as described in Experiment 1.

A non-concurrent multiple-baseline design was used in which the number of baseline sessions varied between 3 and 6 with exact number of sessions contingent upon performance stability for each participant. During baseline, participants were instructed that they could ask questions regarding interacting with the game interface, but that any questions regarding strategy would not be answered. Baseline continued until stable responding of correct play was observed, with stability defined as 3 of 4 consecutive sessions with Percentage Correct Play within a range of 10% observed.

Upon completion of baseline, performance feedback was instated to train participants for correct play. Training consisted of the introduction of a warning pop-up box that would appear on the computer screen informing participants of an error in their play (after desired cards were held and/or discarded) and the overall cost of the current error on their long run financial return. This pop-up warning did not inform participants of what the correct play would be; however, it did give them the option of playing the hand as currently chosen or to go back and change the cards currently held. Participants were instructed to always choose to go back and change the cards held, and that if in 5 attempts at determining the correct play, they were unsuccessful, that they could ask the experimenter for feedback regarding the correct play. When necessary, this personalized feedback consisted of a description of the correct cards to hold and discard based on the payout table for the chosen game. Performance feedback continued until two consecutive sessions were observed with percent correct responding being 20% or greater over the mean of the last 3 baseline sessions' percentage.

If participants displayed more than 2 consecutive data points with no increase over baseline performance, an advanced-training component consisting of prompts on every trial during the next session was instituted. For this advanced training the experimenter sat with the participant and explained the

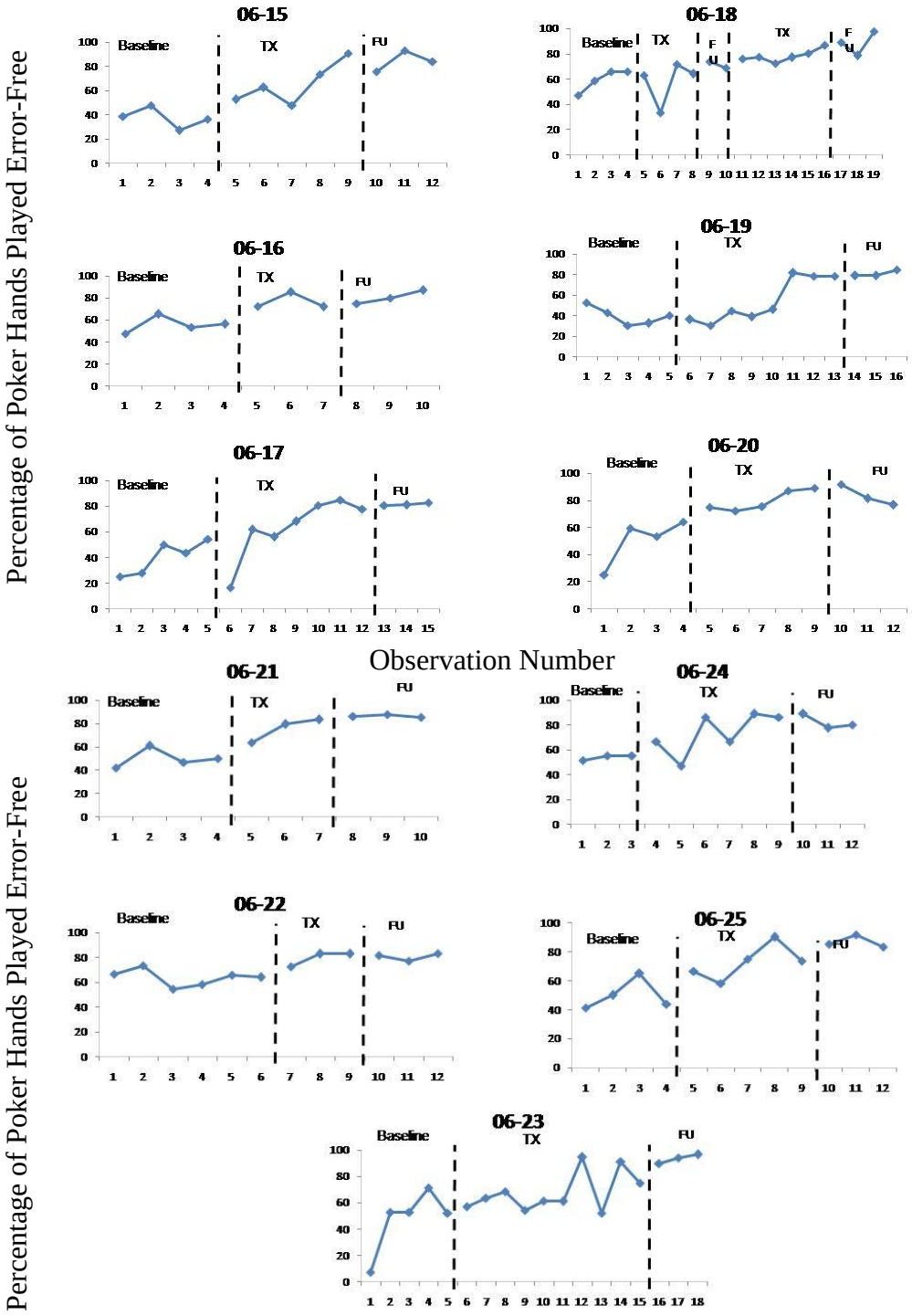

Figure 1. Displays the performance of the eleven participants of Experiment 2. Each participant was initially allowed to play Deuces Wild Poker without any feedback, followed by the performance feedback intervention, and eventually a follow-up condition.

correct play based on the cards dealt and the payout table for the given game for each hand played. These prompted sessions continued until a session with percent correct responding of greater than 20% over the mean of the last three baseline data points was observed. Once this criterion was reached, regular training conditions were reinstated.

Following each participant's attainment of the training criterion increase over baseline, they completed a follow-up phase under the same parameters as baseline. No feedback of any kind was given and participants were instructed that they once again could not ask questions regarding playing strategy. Participants were informed that if their fell back to baseline levels they would have to repeat training. A criteria of no more than two observations with percent correct responding less than 10% over the mean of the last three baseline points was in place during follow up, though no participant failed to maintain responding over baseline levels. Follow up continued for a minimum of three data points.

EXPERIMENT 2
RESULTS AND DISCUSSION

Figure 1 displays the performance of the 11 participants in Experiment 2. Baseline data indicate that many errors were made during every session. In other words, accurate play of optimal poker cards held and discarded was rather low. No participant achieved a Percent Correct Play over 75% during any session, with the lowest observed accuracy being less than 10%. Nonetheless, upon introduction of the performance feedback intervention, error percentages declined dramatically with a concomitant increase in percentage correct play. All 11 participants improved performance over baseline and all 11 maintained these performance gains after the removal of the feedback. No session during follow-up revealed less than 75% percentage correct play in any session for any participant.

GENERAL DISCUSSION

Taken together, the results from the present two experiments suggest that recreational gamblers who play video poker do in fact make a substantial amount of errors. The type of game played can impact the rate of errors, and performance feedback can improve performance. Errors cost the player money, as non-optimal play results in more losing hands at poker than need be if the hand is played more accurately. When a degree of skill is necessary to "win" at a gamble, it is advantageous to develop those skills as best possible. Performance feedback has yielded utility to improve skills in many areas (e.g., Kladopoulos & McComas, 2001; Mellalieu, Hanton, & O'Brien, 2006; Smith & Ward, 2006) outside of gambling, and the present results suggest that such feedback can benefit the recreational gambler.

A potential limitation of the present study is that it cannot conclude error reduction will result in a smaller amount of money being spent at a casino. In fact, teaching someone to play better may only produce a player that plays longer in duration, as the same amount of money will simply go further. Future research should explore length of play, level of risk taken, and resistance to extinction following performance feedback training similar to that of the present study. Finally, experiments such as the present may in fact pose a risk to participants that could eventually develop more severe gambling behavior after exposure to an intervention that taught them to play "better." It may be possible that a participant could develop a self-rule such as "I now know how to beat the house, I will become a millionaire" as suggested by Zlomke and Dixon (2006). Caution should be taken to debrief participants and assure them that the odds will never be in their favor, not even for the most error-free video poker player. Many public campaigns are designed to teach people educated ways to consume alcohol (i.e., in moderation and not while driving). Perhaps simi-

lar attention should be paid to persons with no known pathologies for gambling, that through a lack of education pay more than necessary for their recreational pastime.

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