Response Perseveration in Psychopaths

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Psychopathic behavior has been described as callous, egocen-
tric, and lacking in forethought. Furthermore, psychopaths dis-
play a near-total disregard for the negative consequences of their
behavior. Although their disregard for the rights and feelings
of others could be explained by a failure of socialization, this
account does not explain psychopaths' apparent disregard for
their own well-being. Rather, psychopaths' lack of insight into
their self-defeating behavior has suggested to many that they are
relatively unable to learn from their mistakes (e.g., Checkley,
1964). Laboratory studies provide additional evidence that psy-
chopaths experience difficulty learning to inhibit responses that
have resulted in punishment (see Blackburn, 1993). Although
this deficit might reflect a general inability to learn from pun-
ishment related to poor fear conditioning or lack of motivation
to avoid punishment, recent evidence suggests that psycho-
paths' deficient avoidance learning is not apparent under all cir-
cumstances (e.g., Newman & Kosson, 1986; Schmauk, 1970;
Siegel, 1970).

An alternative account of psychopaths' failure to inhibit pun-
ished responses proposed by Gorenstein and Newman (1986) is
that psychopaths are prone to perseveration. Following
McCleary (1966), perseveration was defined as the tendency to
continue a response set for reward despite punishment or
changes in environmental contingencies that reduce the adap-
tiveness of continued responding. Thus, the concept of persever-
ation places subjects' reaction to punishment and avoidance
learning within the context of its interaction with reward-seeking
behavior (see also Fowles, 1980; Gray, 1971, 1982). More
specifically, we proposed that once psychopaths adopt a re-
response set for reward, they have difficulty attending to compet-
ing response contingencies (Newman, Widdom, & Nathan,
1985).

Studies designed to assess response perseveration in psycho-
paths and other disinhibited individuals have yielded mixed re-
results (e.g., Gorenstein, 1982; Hare, 1984; Waid & Orne,
1982). However, none employed concrete incentives. Our original
formula tions concerning response perseveration in psychopaths
emphasized the importance of reward for observing persevera-
tion in psychopaths (Gorenstein & Newman, 1985); and recent
evidence reinforces the importance of motivational factors
(Newman & Howland, 1986; Newman & Kosson, 1986; New-
man et al., 1985). On the other hand, our investigations of re-
response perseveration have assessed subjects' ability to modulate
(occiasionally withhold) responding in accord with discriminat-
ing stimuli on a trial-by-trial basis but—unlike traditional
assessments of response perseveration—have not required sub-
jects to extinguish their original response set completely.

Although new designed to assess perseveration, one additional
experience (Siegel, 1979) is clearly relevant. Subjects were pro-
vided an opportunity to play as many cards as they wished from
11 decks of playing cards that varied in the probability of pun-
ishment (vs. reward) from 0% to 100%. Although the group
differences were not significant at the extreme probabilities of
punishment, psychopaths played more cards than controls did
at every level of punishment. These data provide evidence that
psychopaths are more likely to respond persistently in situations
that provide immediate rewards and punishments. However,
because the probability of winning and losing did not vary
within a deck of cards, these data provide little information
about psychopaths' ability to modulate their response set in ac-
cord with changing environmental circumstances. In addition,
it seems likely that the low rate of reward in the 90% and 100%
punishment decks was not sufficient to ensure the formation of
a dominant response set for reward.

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Thus, although several studies indicate that psychophaths are persistent in reward-seeking behavior and deficient in response modulation, no study to date has assessed their ability to alter a reinforcer set for change. Consistent response contingencies transform a previously adaptive (i.e., rewarded) response set into a maladaptive one. To provide such an assessment, we employed a modified version of Sigel's (1978) card-playing task. The task involved only one deck of 60 cards, and the probability of punishment was increased nearly by 100% with each successive block of 10 cards. An initial high rate of reward (90%) was used to establish a dominant response set that subjects would need to alter as the card-playing response became more often punished than rewarded. We predicted that psychophaths would show significantly more cards than nonpsychopathic controls. Furthermore, to distinguish such response perseveration from adaptive response persistence, we analyzed data on subjects' earnings. We predicted that psychophaths would earn significantly less money than nonpsychophaths.

The second purpose of this experiment was to explore manipulations that might reduce response perseverance in psychophaths. One manipulation involving a cumulative display (CS+)-response feedback was suggested by Trease (Gallup, Snuket, & Adams 1976; Painting, 1961) and theory (Hare, 1970) indicating that psychophaths appear to have difficulty associating events that are separated in time. We anticipated that cumulative feedback, illustrating how the probability of punishment was changing, would reduce the need to integrate feedback over time and help subjects to abandon their reward-seeking behavior at a more appropriate time. A second manipulation involved forcing subjects to wait for a brief time following response feedback. This procedure was based on recent research indicating that psychophaths and other disassociated subjects are less likely to control after receiving negative feedback. This failure to produce following punishment is related to poorer learning from punished errors (Newman & Howland, 1986; Patterson, Kinsson, & Newman, 1987). We reasoned that if subjects were forced after every error feedback, would improve their use of information about the changing probability of punishment and would reduce perseveration.

Method

Subjects

Thirty-six psychophaths and 36 controls were selected from White male inmates at a minimum security prison in Oshkosh, Wisconsin, by means of Hare's (1980) 22-item Psychopathy Checklist, Hare (1980) and others (Kinsson, Nicholls, & Newman, 1986; Schroder, Schneider, & Hare, 1983) have provided substantial evidence that the psychopathy checklist is both a reliable and valid measure of psychopathy for incarcerated White men. Inter-rater reliability in our research has approached the levels reported by Hare and his colleagues, averaging .84 during the first 2 years of our program (see Kinsson et al., 1986, for more details). Subjects whose psychopathy scores averaged 3.5 or greater were designated psychophaths, and those whose scores averaged 2.0 or less were designated nonpsychophaths. Subjects were excluded from the study if they were over 40, had borderline or low intelligence as measured by the Shipley Institute of Living Scale (Shipley, 1940) or scored in the institution files, displayed any evidence of psychoticism, or took psychotropic medications. Group means for psychophaths and nonpsychophaths were 34.21 (SD = 2.47) and 15.61 (SD = 3.31), respectively, for psychopathy ratings. 199.22 (SD = 9.13) and 109.21 (SD = 8.04) for age (mean = 27.92; SD = 1.00) and 35.51 (SD = 7.10) and 26.72 (SD = 6.02) for age (mean = 1.00). All subjects in this experiment had participated in one or more behavioral tasks prior to this one. The card reinforcement task was always performed, in a controlled-balanced order, with a computerized version of the Wisconsin Card Sorting Task (Newman & Howland, 1986). Subjects were randomly assigned to perform the card-playing task under one of three conditions, with the condition of filing each of our cells (2 groups, 3 conditions) as quickly as possible. We call the experimental group the "money" group.

Procedure

All subjects having selection criteria were contacted about participating in a study involving a 1-hr interview and several computer-controlled behavioral tasks that provided an opportunity to earn money. Subjects were paid $3.50 for the interview and were compensated again usually within 2 to 8 weeks to complete the behavioral tasks. The 200 cards in the deck were presented via an Apple IIe Plus computer and a stereo color monitor in a programmed order of face cards and number cards. At the beginning of each trial, a rectangular (3 cm wide × 3.5 cm high) appeared on the screen with a large question mark in the center; the words DO YOU WANT TO PLAY? were printed on the right side. On every trial, subjects had choices to play the next card or quit the game. To play, subjects pressed the first of four buttons, mounted on the top of a plastic box (11 × 8.5 × 5.5 cm). After each play, the question mark in the rectangle was replaced with an uppercase letter that represented one of the cards (i.e., J, Q, K, or A, for jack, queen, king, or ace of any suit). A word (i.e., WARM or COLD) was shown on the left side of the rectangle. To quit, subjects pressed the second button. Subjects began the task with 10 chips, each worth 54, and were instructed to play as many cards as they wished. The experimenter recorded information informing subjects how to play a card and how to quit the game and also informed subjects the task did not involve a random order of playing cards so that they could not predict how many of each card would appear. The experiment went on until the subject ran out of chips. Subjects were shown whatever a bettor press was followed by a face card (i.e., J, Q, K, A), and they last 24 whenever a number card appeared. The probability of losing (i.e., getting a number card) increased 10 times every block of 10 cards from 10% to 10%. The dependent measure was the number of cards played before quitting. In addition, we recorded the amount of money that each subject won or lost during the task. Except for the defining characteristics, all the remaining conditions were identical. In Condition 1, subjects could respond to the next card as quickly as they wished and received immediate feedback only (i.e., the computer-delivered-statement and the addition of substitutions of a partner chip. Condition IC was identical to Condition 1 except that subjects in Condition IC received cumulative as well as immediate feedback. This is, after each play, the letter or number that had appeared inside the rectangle was written at the top of the monitor. These letters and numbers, which were 0.5 cm high, appeared in rows of 10 across and remained visible throughout the task. Condition IC was identical to Condition IC with the exception that the rectangle with the question mark and the word WARM or COLD never appeared until 5 after the feedback for the prior play (i.e., after a 5-sec wait).

Results

A three-way analysis of variance (ANOVA) with group, condition, and order as between-subjects variables was conducted to
assess the effect of the counterbalancing variable (order) on number of cards played and amount of money earned. Because none of the main effects or interactions involving order of task administration was significant, this variable was dropped from subsequent analyses.

Number of Cards Played

The mean number of cards played by psychopaths and controls was 89.6 (SD = 16.9) and 62.8 (SD = 27.9), respectively, in Condition 1, 90.8 (SD = 24.6) and 61.8 (SD = 24.5) in Condition 2, and 48.4 (SD = 31.9) and 48.3 (SD = 21.6) in Condition ICW.

Hypotheses were tested using planned comparisons. To test the first hypothesis, we compared the mean number of cards played by psychopaths and controls in Condition 1. As predicted, psychopaths played significantly more cards than controls did, (t(66) = 2.62, p < .02. Second, we examined the Group x Condition interaction involving Conditions 1 and ICW to test the hypothesis that providing subjects with cumulative feedback would reduce psychopaths' relative perseverative deficit. Contrary to prediction, the interaction was not significant, (t(66) < 1.0. Finally, we tested the Group x Condition interaction involving Conditions 1 and ICW to test the hypothesis that an enforced wait in conjunction with cumulative feedback would reduce the group difference in response perseverence. Consistent with prediction, the interaction was significant at the .02 level, (t(66) = 2.61).

Additional information is provided by the overall ANOVA. This analysis yielded significant effects for group, F(1, 66) = 6.72, p < .02, and condition, F(2, 64) = 4.88, p < .01. Contrary to prediction, the Group x Condition interaction was not significant, F(2, 66) = 1.81, providing further evidence that the reduction of response perseverence in psychopaths was specific to Condition ICW.

Amount of Money Earned

The mean earnings for psychopaths and controls were 414 (SD = 50) and 994 (SD = 52), respectively, in Condition 1; 594 (SD = 57) and 1,008 (SD = 38) in Condition IC, and $1.09 (SD = 44) and $1.27 (SD = 26) in Condition ICW.

Planned comparisons were conducted to test the specific hypotheses. As predicted, psychopaths earned significantly less money than controls did in Condition 1, (t(66) = 3.02, p < .01. Although the Group x Condition interaction involving Condition ICW was not significant, (t(66) < 1.0, the Group x Condition interaction involving Condition ICW was significant, (t(66) = 2.09, p < .05. Thus, in addition to reducing group differences in number of cards played, the wait plus cumulative feedback employed in Condition ICW reduced group differences in the amount of money earned.

To provide additional information, the results of the two-way ANOVA for money earned are also reported. This analysis yielded significant main effects for group, F(1, 66) = 13.74, p < .001, and condition, F(2, 66) = 6.70, p < .005, but the Group x Condition interaction was not significant, F(2, 66) = 1.2.

Discussion

The results of this study provide unambiguous evidence of response perseverence in psychopaths. Whereas controls had little difficulty noticing the steady increases in the probability of punishment and adjusting their responding accordingly, psychopaths failed to alter their dominant response set for reward. In fact, 9 of the 12 psychopaths in the immediate feedback condition never quit (i.e., played the entire deck of 100 cards), despite losing money on 19 of the last 20 trials.

Moreover, psychopaths' response persistence was maladaptive and resulted in their earning significantly less money than controls. This finding is noteworthy in light of results reported by Schmuck (1970) suggesting that psychopaths are especially motivated to avoid loss of money. Though statistically significant, group differences of less than 1 $ may not seem monetarily significant. However, even small amounts of money are apt to be meaningful in a prison economy in which sources of income are relatively scarce and the minimum wage is 154 per hour. Also, subjects who responded excessively and saw their earnings first increase and then decrease appeared genuinely bothered by the outcome and often verbalized self-recriminations (e.g., "I should've quit when I had all those chips"). Beyond demonstrating response perseverence in psychopaths, a second goal of this experiment was to explore condition manipulations that might reduce their perseverative deficit. In contrast to the manipulation involving the cumulative display alone, which was relatively ineffective in reducing perseverence in psychopaths, the Group x Condition interaction involving Condition ICW indicates that the combination of a 5 s pause together with cumulative feedback significantly reduced their perseverative deficit. In fact, the mean number of cards played by psychopaths and controls in Condition ICW indicates that both groups terminated the game when monetary punishments became as frequent as monetary rewards. Despite the fact that postfeedback delays were effective in reducing psychopaths' response perseverence, the possibility remains that a difference between groups would have emerged if our control condition involving response prevention plus feedback had not led to near-optimal performance for both groups. Thus, future research should attempt to match experimental conditions for difficulty level to rule out the possibility that a "floor effect" rather than the feedback manipulation is responsible for the absence of group differences seen in Condition ICW.

Finally, the rationale for imposing a 5 s interval between response feedback and the presentation of the next opportunity was to interrupt psychopaths' response set and increase their use of the response feedback. However, the task afforded no direct measure of subjects' response set or attention to response feedback. Although such influences are necessarily speculative, a series of studies in our laboratory has demonstrated a relation between the time that the subjects pause after punishment and their ability to profit from punished errors. Whether the pause is imposed by the experimental procedure or is the result of intrinsic differences in response style, longer pauses after negative feedback are associated with better modulation of behavior in accord with response feedback (Newman & Howland, 1986; Newsham, Patterson, & Howland, 1986; Patterson et
In conclusion, whether such manipulations have a selective impact on psychopathic or improve the performance of nonpsychopaths as well, interventions that reduce psychopaths’ maladaptive perseveration by imposing a delay between response feedback and the next opportunity to respond may prove clinically important.

References


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