

## Delay of Gratification in Psychopathic and Nonpsychopathic Offenders

Joseph P. Newman  
University of Wisconsin—Madison

David S. Kosson  
University of North Carolina at Greensboro

C. Mark Patterson  
University of Wisconsin—Madison

Delay of gratification is a prototypical measure of self-control that merits systematic investigation in psychopaths. White male prisoners were provided with repeated opportunities to select an immediate response with uncertain reward or a delayed response with a higher rate of reward under one of three incentive conditions. Psychopaths' performance depended on their level of trait anxiety and incentive condition: Whereas low-anxious psychopaths were relatively unwilling to delay when omission of expected rewards also incurred monetary punishments, they displayed relatively superior performance when the task involved rewards only. Findings complement those for passive avoidance learning in psychopaths and suggest that inhibitory self-control in low-anxious psychopaths is somewhat impaired under conditions involving a combination of monetary rewards and punishments.

Delay of gratification involves postponing immediate satisfaction to obtain greater rewards in the future. Because delay of gratification necessitates resisting an immediate reward, it is regarded as a prototypical measure of self-control (Logue, 1988; Mischel, Shoda, & Rodriguez, 1989) with fundamental implications for successful socialization (e.g., Wilson & Herrnstein, 1985). In accordance with this characterization, Mischel et al. (1989) found that the tendency to delay gratification in 4-year-olds was predictive of a variety of attributes related to successful adjustment measured 10 years later, especially if that tendency was assessed in the presence of a desired object and without prior instruction in coping with the delay interval. For example, preschoolers displaying longer delay times under these circumstances were subsequently rated as "more competent, planful, and intelligent, . . . more able to pursue goals and to delay gratification, better in self-control, more able to resist temptation, to tolerate frustration, and to cope maturely with stress" (p. 936).

In light of the proposed relation between delay of gratification and self-control, it is not surprising that theorists have attempted to link deficits in delay of gratification with impulsive, unsocialized groups such as psychopathic offenders and juvenile delinquents. Using both Minnesota Multiphasic Personality Inventory (MMPI) scores to select subjects and a questionnaire measure of delay, Blanchard and his colleagues (Blanchard, Bassett, & Koshland, 1977; Unikel & Blanchard, 1973)

found that White (though not Black) psychopathic adolescents and adult offenders were less willing to delay gratification despite the opportunity to triple their rewards by waiting. Widom (1977) investigated delay of gratification in noninstitutionalized psychopaths recruited through a newspaper advertisement. She gave her subjects a choice between receiving cash payment immediately after their experimental session and being paid twice the amount after a 1-week delay. Although results were complicated by a correlation between decision to delay and employment status, she found that higher scores on the MMPI Psychopathic Deviate scale were associated with the decision to take the smaller but immediate payment. These studies notwithstanding, there have been surprisingly few studies of delay of gratification in psychopaths. Moreover, the aforementioned findings were based on self-report instead of clinical ratings of psychopathy, and the use of self-report measures for selecting psychopaths has been faulted (Hare, 1985a; Hare & Cox, 1978).

In their brief review of impulsive behavior, including delay of gratification in psychopaths, Brantley and Sutker (1984) noted that global statements regarding delay of gratification in psychopaths are unwarranted, and they emphasized the necessity of examining Personality  $\times$  Situation interactions in subsequent research. Similarly, Mischel (1983) highlighted the importance of identifying stable individual difference variables that interact with situational parameters to affect a person's ability to engage in adaptive self-control. In characterizing this interaction, Mischel and his colleagues attended primarily to cognitive strategies that influence subjects' perceptions of the delay interval. To the extent that subjects focus on the appealing aspect of their goal, they are relatively unable to tolerate the delay interval, whereas to the extent that subjects are able to use cognitive strategies to convert "the frustrating delay-of-reward situation into a less aversive one" (Mischel, 1983, p. 153), their ability to tolerate delay is enhanced. Mischel et al. (1989) used the expression *hot cognition* to describe the arousing element of cognition that interferes with delaying gratification.

---

This research was supported by a research grant from the National Institute of Mental Health (MH37711).

The authors gratefully acknowledge the cooperation of the staff at Oakhill Correctional Institution and the Wisconsin Division of Corrections. We thank Jeff Wydevan, Deb March, and Bev Mars from Oakhill and Pete Arnett, Randy Busse, and Stevens Smith from the University of Wisconsin for their contributions to this research.

Correspondence concerning this article should be addressed to Joseph P. Newman, Department of Psychology, 1202 West Johnson Street, University of Wisconsin, Madison, Wisconsin 53706.

Research on passive avoidance learning provides evidence that psychopaths' failure to withhold inappropriate responses is dependent on situational factors (i.e., incentive conditions). Whereas psychopaths committed significantly more passive avoidance errors than did control subjects when correct responses were rewarded and incorrect responses were punished, they performed nonsignificantly better than control subjects under conditions involving punishment only (Newman & Kosson, 1986). Several recent studies provide additional evidence that psychopaths and other unsocialized groups display poor response inhibition under experimental conditions involving monetary rewards and punishments (e.g., Daugherty & Quay, 1990; Moses, Ratliff, & Ratliff, 1979; Newman, Patterson, & Kosson, 1987; Newman, Widom, & Nathan, 1985; Shapiro, Quay, Hogan, & Schwartz, 1988; Siegel, 1978).

The primary purpose of our study was to investigate whether tendency to delay gratification, like passive avoidance learning, in psychopaths depends on the motivational (i.e., incentive) context in which the behavior occurs (see Gorenstein & Newman, 1980; Newman, Gorenstein, & Kelsey, 1983). To this end, we presented subjects with a series of trials involving a choice between two response alternatives: an immediate response with a relatively low probability of reward and a delayed response with a relatively high probability of reward (Condition REW). A second condition (Condition REW + PUN) involved similar response contingencies but, in addition to winning money, subjects lost money on trials when rewards were not delivered. A third condition was identical to Condition REW except that both response options were delayed by an equal amount of time (Condition EQ). This condition served as a baseline for assessing the extent to which subjects were (a) able to discern the different payoffs associated with the two response options and (b) motivated to select the response associated with more frequent reward.

In addition to classifying subjects according to the Psychopathy Checklist (PCL; Hare, 1980; 1985b), we subdivided subjects on the basis of scores on the Welsh Anxiety Scale (Welsh, 1956). A substantial body of evidence demonstrates that scores on trait measures of anxiety/neuroticism, such as the Welsh Anxiety Scale, are predictive of the expression of disinhibited behavior in psychopaths (e.g., Chesno & Kilmann, 1975; Schmauk, 1970; Widom, 1976). Most investigations demonstrating the importance of anxiety in moderating psychopaths' performance have assessed psychopathy with self-report measures; however, recent research with the Psychopathy Checklist has yielded similar findings. For example, as in earlier reports involving the use of self-report measures of psychopathy, Newman, Patterson, Howland, and Nichols (1990) found that poor passive avoidance learning in psychopathic subjects was specific to psychopaths with low levels of anxiety. Thus, we used anxiety level as a blocking factor in this study. In the event that anxiety interacted with psychopathy, we planned to test our principal hypotheses with low-anxious psychopaths and control subjects. Many investigators consider low-anxious psychopaths to be the primary (i.e., genuine) psychopathic group (see Newman et al., 1985, 1990).

### Hypotheses

First, on the basis of our proposal that psychopaths have difficulty withholding responses for reward (Gorenstein &

Newman, 1980; Newman et al., 1983), we predicted that, in relation to Condition EQ, psychopaths would be less likely than control subjects to endure the delay associated with the high-density reward (HDR) response in Condition REW. Although both responses were associated with reward, the response had to be withheld to delay gratification.

Second, on the basis of evidence suggesting that psychopaths' inhibitory deficits may be specific to conditions involving both reward and punishment contingencies (see Newman et al., 1990), we predicted that in comparison with their performance in Condition EQ, psychopaths would make fewer HDR responses than would control subjects in Condition REW + PUN.

Third, in light of fact that psychopaths' inhibitory problems appear to be most evident under conditions involving combined rewards and punishments, we predicted that, in comparison to control subjects, psychopaths would display poorer delay of gratification in Condition REW + PUN than in Condition REW.

In addition to these principal hypotheses, we planned to examine subjects' earnings and speed of responding in supplementary analyses. Response speed was analyzed because it provides a behavioral index of nonspecific arousal (Gray, 1987). Investigators have postulated that high levels of nonspecific arousal decrease both response inhibition and the ability to delay gratification (see Wallace, Bachorowski, & Newman, 1991).

## Method

### Subjects

Subjects were White male inmates at a minimum-security state prison in Wisconsin. Candidates for participation were randomly selected from the institution roster. Men were excluded if their files described them as 40 or older, currently psychotic or taking psychotropic medication, or scoring borderline or lower on measures of intelligence administered by the Division of Corrections or if the Stanford Achievement Test scores routinely reported in prison files indicated that reading skill was below the fourth-grade level. The remaining subjects were invited to participate in a semistructured interview designed for this research (see Kosson, Smith, & Newman, 1990, for more details). After the interview and a review of selected portions of the inmate's file, subjects were rated on the 20-item version of the PCL (Hare, 1985b). Hare et al. (1990) provided substantial evidence that the PCL is a reliable and valid instrument for the assessment of psychopathy. Subjects earning scores of 30 or higher were labeled psychopaths, and those earning scores of 22 or lower were labeled nonpsychopaths. A total of 158 subjects earning PCL scores in the psychopathic or nonpsychopathic range and who met all screening criteria participated in the study. Interrater reliability (based on 78 subjects) for the raters employed in this study was .81. For our sample, multiple ratings were available for 30 subjects, and the interrater reliability was .80.

In addition, subjects were subdivided at the median on the Welsh Anxiety Scale. Both vocabulary and conceptual quotient components of the Shipley Scale (Zachary, 1986) were administered to provide a comparable estimate of intelligence for all subjects. All subjects obtained Shipley-estimated Wechsler Adult Intelligence Scale—Revised (WAIS-R) scores of 75 or higher. Group characteristics are summarized in Table 1.

Table 1  
*Group Means for Psychopathy, Anxiety, Age, Education, and Intelligence by Group*

Group	<i>n</i>	Psychopathy	Anxiety	Age	Education	Intelligence
Low-anxious psychopaths	29	32.21	5.14	27.2	10.4	101.6
High-anxious psychopaths	44	32.77	18.16	26.5	10.4	94.6
Low-anxious nonpsychopaths	45	14.84	5.29	27.2	11.2	101.3
High-anxious nonpsychopaths	40	16.15	19.38	26.2	10.6	95.6

*Note.* Psychopathy = mean scores on the Psychopathy Checklist; Anxiety = mean scores on the Welsh Anxiety Scale; Age = mean age in years; Education = mean education in years; Intelligence = mean Wechsler Adult Intelligence Scale—Revised estimate from Shipley Institute of Living Scale.

### Apparatus and Task

The delay of gratification task was administered with an Apple II+ computer, a 13-in. (33-cm) monitor, and a plastic response box (16 × 9.5 × 5 cm) with two push buttons.

At the beginning of each trial, two empty rectangles appeared on the computer monitor. The rectangles measured 5.3 × 3.2 cm and were displayed side by side in the center of the video display, 8 cm from the top of the screen and 6 cm apart. A label, *Button 1* or *Button 2*, appeared in the center of the rectangles according to the timing parameters of each condition. A third rectangle (13 × 3.5 cm) appeared below the other two and remained on the screen once subjects began responding for money. The expression *Earnings = \$x.xx* appeared inside this rectangle and provided subjects with a continuous display of their earnings.

Subjects performed the task under one of three conditions: In Condition REW, responses to one button were rewarded (5 cents won) on 80% of the trials, whereas responses to the other button were rewarded on 40% of the trials. Subjects could press the 40% button as soon as the trial began, as indicated by the presence of the expression *Button 1* or *Button 2* in the center of one of the rectangles, but the 80% (i.e., HDR) button could not be pressed until the corresponding expression appeared in the other box 10 s later. If a subject responded to a button before the corresponding label appeared, the response was ignored, and no data were recorded.

In Condition REW + PUN, responses to one button were rewarded on 90% and punished (5 cents lost) on 10% of the trials, whereas responses to the other button were rewarded on 70% and punished on 30% of the trials. These percentages were selected to match the payoffs of Condition REW: in both conditions, subjects would win \$2.00 if they pressed the HDR button on every trial and \$1.00 if they always pressed the low-density reward button. The delay contingencies were also the same as in Condition REW: the delayed response was paired with the more frequent rewards. Condition EQ was identical to Condition REW (i.e., the two choices were rewarded on 80% and 40% of the trials) except that subjects had to wait 10 s before they could respond to either button (i.e., the labels *Button 1* and *Button 2* did not appear in the rectangles until after 10 s). The HDR button was counterbalanced within each condition.

Feedback was provided after every response. In Conditions REW and EQ, the computer displayed the message "You win!" on reward trials and "-----" (i.e., 8 hyphens) when rewards were omitted. In Condition REW + PUN, the messages "You win!" and "You lose." were displayed. The feedback display lasted for 2 s and was followed immediately by another trial.

Subjects in all three conditions underwent 20 trials of guided practice to acquaint them with the consequences of choosing to press the

two buttons. Half of the subjects were instructed to press *Button 1* ten times and then to press *Button 2* ten times. The remaining subjects pressed *Button 2* ten times before pressing *Button 1*. The probabilities of winning and losing and the delay intervals used during the practice trials were identical to those in effect during the test trials that followed. The chief differences between practice and test trials were that during practice trials, subjects had no choice regarding which button to press and could not earn or lose any money.

Although task instructions included no mention of response latency, the computer recorded subjects' valid response latencies on a trial-by-trial basis.

### Procedure

Testing was conducted individually in an office in the social services building at the prison. The Welsh Anxiety and Shipley scales were administered on the first day of behavioral testing along with two computer-administered tasks.<sup>1</sup> The delay task was administered on the 2nd day of behavioral testing in counterbalanced order with a computerized pattern-matching task (Newman et al., 1990, Experiment 3). Because two tasks were performed on the first day of testing, the delay task was either the third or the fourth task completed. A standard set of instructions informed subjects that we were interested in their choice-making behavior and that they should try to earn as much money as possible. After the practice trials, the experimenter described the test trials and demonstrated the procedure for choosing each button in two example trials. After answering any questions, the experimenter pressed a button to begin the 50 test trials. The male experimenter sat next to subjects during the task to give and take away plastic poker chips worth 5 cents in accord with the experimental condition.

## Results

### Subject Characteristics

Analysis of variance (ANOVA) was used to test for group differences in age, education, and intelligence. These analyses yielded only one significant difference: High-anxious subjects

<sup>1</sup> The data from these tasks are unpublished. The first task involved passive avoidance learning and resembled the task used by Patterson, Kosson, and Newman (1987, Experiment 1). The second task involved either a computerized version of the Wisconsin Card Sorting Task or a pilot version of a switching-of-attention task. Because the delay task was always preceded by other tasks, we cannot rule out the possibility that our results were influenced by subjects' prior experience.

obtained lower intelligence scores than did low-anxious subjects,  $F(1, 154) = 17.31, p < .001$ . Thus we computed correlations between subjects' WAIS-R estimates and their decision to choose the HDR response within each condition. None of these correlations approached significance,  $r(55) = .138$  in Condition REW,  $r(52) = .019$  in Condition REW + PUN, and  $r(51) = -.033$  in Condition EQ. Because intelligence was unrelated to performance, no correction was used.

*Task Performance*

The primary dependent measure for this task was the percentage of trials on which subjects delayed gratification by waiting 10 s to press the HDR button. Because subjects did not have an immediate response option in Condition EQ, we do not use the term *delayed response*; we refer instead to the HDR response. In preliminary analyses we examined the two counterbalancing variables: order in which the practice trials were administered (i.e., HDR first or second) and button associated with the HDR response. Neither variable was related to choice of the HDR response during the test trials ( $F_s < 1.0$ ).

The data were analyzed in a  $2 \times 2 \times 3 \times 2$  (Level of Psychopathy  $\times$  Level of Anxiety  $\times$  Condition  $\times$  Block of 25 Trials) mixed-model ANOVA. The analysis revealed significant main effects for condition,  $F(2, 146) = 36.58, p < .001$ , and trial block,  $F(1, 146) = 9.11, p = .003$ . There were also a significant Trial Block  $\times$  Condition interaction,  $F(2, 146) = 16.44, p < .001$ , and a significant Psychopathy  $\times$  Anxiety  $\times$  Condition interaction,  $F(2, 146) = 3.45, p = .034$ . Although qualified by the three-way interaction (to be discussed), the condition effect indicates that on average, when scores were collapsed across group, subjects in Condition EQ were significantly more likely to choose the HDR response than were subjects in Conditions REW,  $F(1, 98) = 35.05, p < .001$ , and REW + PUN,  $F(1, 95) = 85.52, p < .001$ , and that subjects in Condition REW were, on average, significantly more likely to choose the HDR response than those in Condition REW + PUN,  $F(1, 99) = 5.24, p < .025$ . As shown in Table 2, the Trial Block  $\times$  Condition interaction indi-

cated that subjects in Condition EQ chose the HDR response more often during Trials 26–50 than during Trials 1–25,  $F(1, 47) = 30.84, p < .001$ , whereas trial block had little effect in other conditions,  $F(1, 51) < 1.0$  for Condition REW and  $F(1, 48) = 1.7, p > .20$ , for Condition REW + PUN.

The significant three-way interaction indicated that both anxiety and condition were important factors mediating psychopaths' performance on this task. Analysis of simple effects revealed that the effects of condition on low-anxious psychopaths and on high-anxious psychopaths were significantly different,  $F(2, 67) = 4.36, p < .02$ , whereas low-anxious and high-anxious control subjects did not differ in this regard,  $F(2, 79) < 1.0$ . The effects within anxiety levels revealed a trend for low-anxious psychopaths to display a stronger condition effect than did low-anxious control subjects,  $F(2, 68) = 2.59, p < .10$ . High-anxious psychopaths and high-anxious control subjects did not differ,  $F(2, 63) = 1.39, p > .20$ . All groups chose the HDR response more often in Condition EQ than in the other conditions; however, after the means for the main effect of condition were adjusted according to the procedure suggested by Rosenthal and Rosenow (1985), low-anxious psychopaths were the only subjects who still displayed a significant condition effect,  $F(2, 26) = 3.53, p < .05$ . Their performance in Condition REW + PUN was significantly poorer than their performances both in Condition REW,  $t(26) = 2.19, p < .05$ , and in Condition EQ,  $t(26) = 2.18, p < .05$ . In Figure 1 we present the data for delay of gratification, collapsed across all 50 trials. In accordance with Rosenthal and Rosenow's procedure, which served to clarify the interaction, group means are shown in relation to the mean for each condition.

Because the effect of psychopathy was found to depend on level of anxiety, we tested our hypotheses with low-anxious psychopaths and low-anxious control subjects.<sup>2</sup> All tests were two-tailed.

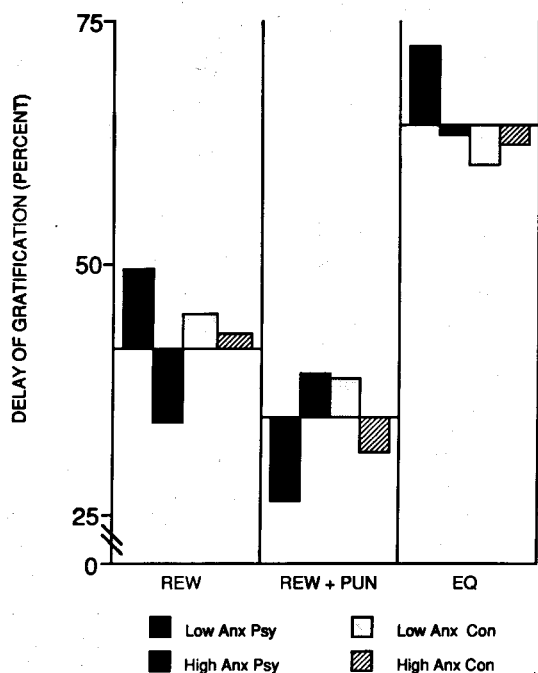
Our first hypothesis concerned delay of gratification in Condition REW. The planned interaction comparison provided no evidence that low-anxious psychopaths performed more poorly than did low-anxious control subjects in Condition REW in relation to performance in Condition EQ,  $t(146) < 1.0$ . In fact, low-anxious psychopaths chose the HDR response nonsignificantly more often than did low-anxious control subjects in both conditions (see Table 2).

Our second hypothesis concerned delay of gratification in Condition REW + PUN in relation to Condition EQ. The planned interaction comparison involving low-anxious psychopaths and low-anxious control subjects was statistically significant,  $t(146) = 2.34, p < .025$ . When used to examine the group differences within conditions,  $t$  tests revealed only a statistical trend; low-anxious psychopaths tended to delay gratification less than did low-anxious control subjects in Condition REW + PUN,  $t(146) = 1.74, p < .10$ .

The third hypothesis concerned the differential effect of punishment on delay of gratification in psychopaths. The interaction contrast comparing the performance of low-anxious psychopaths and low-anxious control subjects in Conditions REW and REW + PUN revealed a statistical trend,  $t(146) = 1.70, p < .10$ . Although, as noted earlier, low-anxious psychopaths delayed gratification significantly less often in Condition REW + PUN than in Condition REW ( $p < .05$ ), the interaction

**Table 2**  
*Percentage Delay of Gratification (or High-Density Reward) by Group and Condition*

Group	Condition		
	R	R + P	EQ
<b>Block 1</b>			
Low-anxious psychopaths	49.71	28.00	68.36
High-anxious psychopaths	34.22	40.53	57.09
Low-anxious nonpsychopaths	45.65	39.14	52.86
High-anxious nonpsychopaths	43.69	33.67	57.07
Across groups	43.32	35.34	58.85
<b>Block 2</b>			
Low-anxious psychopaths	50.29	25.09	76.00
High-anxious psychopaths	34.89	38.93	69.82
Low-anxious nonpsychopaths	44.71	39.14	68.57
High-anxious nonpsychopaths	43.69	29.67	67.47
Across groups	43.40	33.20	70.47



**Figure 1.** Delay of gratification as a function of psychopathy, anxiety, and condition. (The three horizontal lines represent the mean of each condition and serve to highlight the relative performance of each group within condition. REW = condition in which rewards only were given; REW + PUN = condition in which rewards and punishment were given; EQ = condition in which high- and low-reward response options were delayed by equal amounts of time. ANX = anxiety; PSY = psychopaths; CON = control subjects.)

was attenuated by a similar, although nonsignificant, effect in low-anxious controls.

### Supplementary Analyses

**Earnings.** The results for earnings closely paralleled those for HDR choice. The overall ANOVA yielded a significant condition effect,  $F(2, 146) = 35.99, p < .001$ , and a significant Psychopathy  $\times$  Anxiety  $\times$  Condition interaction,  $F(2, 146) = 3.42, p < .04$ . As in earlier analyses, the significance of the interaction was attributable primarily to the performance of low-anxious psychopaths, who earned the most money in Condition EQ (\$1.73) and the least amount of money in Condition REW + PUN (\$1.27). Planned comparisons, paralleling those for choice behavior, revealed a significant Group  $\times$  Condition interaction for Conditions REW + PUN and EQ,  $t(146) = 2.26, p < .05$ : Low-anxious psychopaths earned nonsignificantly less money than did control subjects in Condition REW + PUN and nonsignificantly more money than did control subjects in Condition EQ, both  $t_s(146) = 1.59$ . The interaction comparison involving Conditions REW and EQ was not significant ( $t < 1.0$ ).

**Response latencies.** Table 3 shows the data for response latency. A  $2 \times 2 \times 2 \times 2$  (Psychopathy  $\times$  Anxiety  $\times$  Conditions REW and REW + PUN  $\times$  Button  $\times$  Trial Blocks) ANOVA with response latency as the dependent measure was conducted to examine speed of responding across conditions. Condition EQ was excluded from this analysis because both responses were

"delayed" in Condition EQ. The analysis revealed a significant effect for condition,  $F(1, 99) = 7.61, p < .01$ , in which subjects in Condition REW + PUN demonstrated significantly shorter response latencies than did those in Condition REW, and a significant Condition  $\times$  Button interaction,  $F(1, 99) = 13.62, p < .001$ , indicating that subjects responded more quickly in Condition REW + PUN than in Condition REW when they pressed the immediate-reward button,  $F(1, 99) = 11.97, p < .001$ , but not when they pressed the delayed-reward button,  $F(1, 99) < 1.0$ . Aside from main effects for button,  $F(1, 99) = 5183.0, p < .001$ , and trial block,  $F(1, 99) = 9.46, p < .005$ , no other main effects or interactions reached statistical significance. The large effect for button indicates that latencies of subjects' responses to the immediate-reward button were shorter than those for the delayed-reward button as required by the experimental procedures, and the effect for trial block reflects the fact that subjects responded more quickly in the second block of trials. Although we used response speed as an index of arousal in prior research, our use of response latencies in this paradigm was considered exploratory. Thus no planned comparisons were conducted.

### Discussion

In comparison with their preference for the HDR response when both response options were delayed (Condition EQ), we predicted that psychopaths would select this response significantly less often than would control subjects in Conditions REW and REW + PUN, in which subjects were provided with an immediate, although less certain, opportunity for reward. Testing this hypothesis was complicated by a significant three-way interaction indicating that low- and high-anxious psychopaths responded differently to the condition manipulation. Thus different factors appear to have mediated delay of gratification, or the lack thereof, in low- and high-anxious psychopaths. This finding is consistent with the results of a variety of studies demonstrating divergent performance in these groups and, in particular, with recent findings that low-anxious, but not high-anxious, psychopaths display poor response modulation on tasks requiring subjects to inhibit reward-seeking behavior to avoid punishment (e.g., Newman et al., 1990).

In light of the significant differences between high- and low-anxious psychopaths, planned comparisons with low-anxious psychopaths and low-anxious control subjects were conducted. The results of these comparisons lend some support for the predictions made for psychopaths and control subjects more generally: Low-anxious psychopaths delayed gratification less often and earned less money than did low-anxious control subjects in Condition REW + PUN in relation to Condition EQ,

<sup>2</sup> Although we made no a priori predictions concerning high-anxious groups, parallel comparisons for high-anxious psychopaths and control subjects are reported for informational purposes. For Hypotheses 1 and 2, neither the interaction comparison involving Conditions REW and EQ,  $t(146) = 1.01$ , nor the comparison involving Conditions REW + PUN and EQ,  $t(146) < 1.0$ , approached statistical significance. For Hypothesis 3, the interaction comparison involving Conditions REW and REW + PUN approached significance,  $t(146) = 1.68, p < .10$ .

**Table 3**  
*Response Latencies (in Milliseconds) by Group and Condition*

Group	Condition R		Condition R + P	
	Immediate	Delayed	Immediate	Delayed
<b>Block 1</b>				
Low-anxious psychopaths	2,201	10,870	1,273	10,784
High-anxious psychopaths	2,803	10,954	2,201	10,902
Low-anxious nonpsychopaths	2,332	11,000	1,538	10,908
High-anxious nonpsychopaths	2,635	10,892	1,359	10,940
<b>Block 2</b>				
Low-anxious psychopaths	1,686	10,890	1,046	10,746
High-anxious psychopaths	2,457	10,303	1,458	10,803
Low-anxious nonpsychopaths	2,302	11,021	1,047	10,873
High-anxious nonpsychopaths	1,854	10,774	1,121	10,917

Note. 10,000 ms was the minimum response latency possible for delayed responses.

and they tended to delay gratification ( $p < .10$ ) less than did control subjects in Condition REW + PUN in relation to Condition REW. However, there was no evidence that low-anxious psychopaths had difficulty delaying gratification in Condition REW or that the deficits seen in Condition REW + PUN were as characteristic of high-anxious as of low-anxious psychopaths. In support of the conclusion of Brantley and Sutker (1984), these findings indicate that psychopaths are not characterized by a pervasive failure to delay gratification and that their disinclination to delay gratification depends, in part, on heretofore unspecified situational factors.

The most interesting finding to emerge from this investigation concerns the significant effect of incentive context on low-anxious psychopaths' delay performance. As noted earlier, this finding replicates and extends previous findings that inhibitory deficits in psychopaths are particularly apparent in tasks involving rewards and punishments, as opposed to those involving reward-only or punishment-only feedback (see Newman et al., 1990). Because low-anxious psychopaths performed at least as well as control subjects in Conditions REW and EQ, the addition of monetary punishments may have been instrumental in differentiating their performance from that of control subjects in Condition REW + PUN.

Because the administration of punishments in Condition REW + PUN also involved changes in the administration (i.e., probabilities) of rewards, the design of this study does not permit unambiguous conclusions regarding the effects of punishment on delay of gratification. Nevertheless, the literature on the effects of punishment suggests two potential explanations. One possibility is that low-anxious psychopaths are less sensitive to punishment or less motivated to avoid punishment, or both, than are control subjects (Hare, 1978; Lykken, 1957). Because punishment typically engenders increases in response suppression and nonspecific arousal (Dickinson, 1975), low-anxious psychopaths in Condition REW + PUN may have experienced lower arousal and been less inclined than low-anxious control subjects to inhibit the immediate response (which resulted in punishment on 30% of the trials) and choose the delayed response, which was punished less frequently (i.e., 10% of the trials).

An alternative possibility is that delay of gratification was

relatively difficult for low-anxious psychopaths in Condition REW + PUN because, for low-anxious psychopaths engaged in reward-seeking behavior, punishment may achieve an increase in arousal but fail to suppress responses (Newman, 1987; Ross & Doody, 1973). In discussing the behavior of animals in approach-avoidance conflicts, Gray (1987) noted that whenever punishment fails to interrupt approach behavior, the nonspecific arousal associated with punishment intensifies subsequent approach behavior (p. 246; see also Dickinson, 1974). To the extent that punishments elicited an increase in nonspecific arousal without a counterbalancing increase in response suppression among low-anxious psychopaths, waiting to respond in Condition REW + PUN may have been especially difficult, aversive, or both for them.

In light of the number of recent reports indicating that psychopaths and other disinhibited persons display poor (regulation) inhibition when monetary rewards and punishments are used in the same task (see Newman et al., 1990) further research is needed for examining whether such deficits reflect a quantitative difference in sensitivity to punishment or a qualitatively different reaction to punishment involving response facilitation as opposed to response inhibition.

### References

- Blanchard, E. B., Bassett, J. E., & Koshland, E. (1977). Psychopathy and delay of gratification. *Criminal Justice and Behavior*, 4, 265-271.
- Brantley, P. J., & Sutker, P. B. (1984). Antisocial behavior disorders. In H. E. Adams & P. B. Sutker (Eds.), *Comprehensive handbook of psychopathology* (pp. 439-478). New York: Plenum Press.
- Chesno, F. A., & Kilmann, P. R. (1975). Effects of stimulation intensity on sociopathic avoidance learning. *Journal of Abnormal Psychology*, 84, 144-150.
- Daugherty, T. K., & Quay, H. C. (1990). Response perseveration and delayed responding in childhood behavior disorders. *Journal of Adolescent and Child Psychiatry*, 29, 620-626.
- Dickinson, A. (1974). Response suppression and facilitation by aversive stimuli following septal lesions in rats: A review and model. *Physiological Psychology*, 2, 444-456.
- Dickinson, A. (1975). Suppressive and enhancing effects of footshock on food-reinforced operant responding following septal lesions in

- rats. *Journal of Comparative and Physiological Psychology*, 88, 851-861.
- Gorenstein, E. E., & Newman, J. P. (1980). Disinhibitory psychopathology: A new perspective and a model for research. *Psychological Review*, 87, 301-315.
- Gray, J. A. (1987). *The psychology of fear and stress*. New York: Cambridge University Press.
- Hare, R. D. (1978). Electrodermal and cardiovascular correlates of psychopathy. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 107-143). Chichester, England: Wiley.
- Hare, R. D. (1980). A research scale for the assessment of psychopathy in criminal populations. *Personality and Individual Differences*, 1, 111-119.
- Hare, R. D. (1985a). Comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, 53, 7-16.
- Hare, R. D. (1985b). *The Psychopathy Checklist*. Unpublished manuscript, University of British Columbia, Vancouver, Canada.
- Hare, R. D., & Cox, D. N. (1978). Clinical and empirical conceptualizations of psychopathy, and the selection of subjects for research. In R. D. Hare & D. Schalling (Eds.), *Psychopathic behavior: Approaches to research* (pp. 1-22). New York: Wiley.
- Hare, R. D., Harpur, T. J., Hakstian, A. R., Forth, A. E., Hart, S. D., & Newman, J. P. (1990). The revised Psychopathy Checklist: Descriptive statistics, reliability, and factor structure. *Journal of Consulting and Clinical Psychology: Psychological Assessment*, 2, 338-341.
- Kosson, D. S., Smith, S. S., & Newman, J. P. (1990). Evaluating the construct validity of the psychopathy construct in Blacks: A preliminary investigation. *Journal of Abnormal Psychology*, 99, 250-259.
- Logue, A. W. (1988). Research on self-control: An integrating framework. *Behavioral Sciences and Brain Sciences*, 4, 665.
- Lykken, D. T. (1957). A study of anxiety in the sociopathic personality. *Journal of Abnormal and Social Psychology*, 55, 6-10.
- Mischel, W. (1983). Delay of gratification as process and as person variable in development. In D. Magnusson & V. L. Allen (Eds.), *Human development: An interactional perspective* (pp. 149-165). New York: Academic Press.
- Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989). Delay of gratification in children. *Science*, 244, 933-938.
- Moses, J. A., Ratliff, R. G., & Ratliff, A. R. (1979). Discrimination learning of delinquent boys as a function of reinforcement contingency and delinquent subtype. *Journal of Abnormal Child Psychology*, 7, 443-453.
- Newman, J. P. (1987). Reaction to punishment in extraverts and psychopaths: Implications for the impulsive behavior of disinhibited individuals. *Journal of Research in Personality*, 21, 464-485.
- Newman, J. P., Gorenstein, E. E., & Kelsey, J. E. (1983). Failure to delay gratification following septal lesions in rats: Implications for an animal model of disinhibitory psychopathology. *Personality and Individual Differences*, 4, 147-156.
- Newman, J. P., & Kosson, D. S. (1986). Passive avoidance learning in psychopathic and nonpsychopathic offenders. *Journal of Abnormal Psychology*, 95, 257-263.
- Newman, J. P., Patterson, C. M., Howland, E. W., & Nichols, S. L. (1990). Passive avoidance in psychopaths: The effects of reward. *Personality and Individual Differences*, 11, 1101-1114.
- Newman, J. P., Patterson, C. M., & Kosson, D. S. (1987). Response perseveration in psychopaths. *Journal of Abnormal Psychology*, 96, 145-148.
- Newman, J. P., Widom, C. S., & Nathan, S. (1985). Passive avoidance in syndromes of disinhibition: Psychopathy and extraversion. *Journal of Personality and Social Psychology*, 48, 1316-1327.
- Patterson, C. M., Kosson, D. S., & Newman, J. P. (1987). Reaction to punishment, reflectivity, and passive avoidance learning in extraverts. *Journal of Personality and Social Psychology*, 52, 565-575.
- Rosenthal, R., & Rosenow, R. L. (1985). *Contrast analyses: Focused comparisons on the analysis of variance*. Cambridge, United Kingdom: Cambridge University Press.
- Ross, R. R., & Doody, K. F. (1973). Persistence in the psychopathic personality. *Canadian Journal of Criminology and Corrections*, 15, 292-305.
- Schmauk, F. J. (1970). Punishment, arousal, and avoidance learning in sociopaths. *Journal of Abnormal Psychology*, 76, 325-335.
- Shapiro, S. K., Quay, H. C., Hogan, A. E., & Schwartz, K. P. (1988). Response perseveration and delayed responding in undersocialized aggressive conduct disorder. *Journal of Abnormal Psychology*, 97, 371-373.
- Siegel, R. A. (1978). Probability of punishment and suppression of behavior in psychopathic and nonpsychopathic offenders. *Journal of Abnormal Psychology*, 87, 514-522.
- Unikel, I. P., & Blanchard, E. B. (1973). Psychopathy, race and delay of gratification by adolescent delinquents. *Journal of Nervous and Mental Disease*, 156, 57-60.
- Wallace, J. F., Bachorowski, J., & Newman, J. P. (1991). Failures of response modulation: Impulsive behavior in anxious and impulsive individuals. *Journal of Research in Personality*, 25, 23-44.
- Welsh, G. S. (1956). Factor dimensions A and R. In G. S. Welsh & W. G. Dahlstrom (Eds.), *Basic readings on the MMPI in psychology and medicine* (pp. 264-281). Minneapolis: University of Minnesota Press.
- Widom, C. S. (1976). Interpersonal conflict and cooperation in psychopaths. *Journal of Abnormal Psychology*, 85, 330-334.
- Widom, C. S. (1977). A methodology for studying noninstitutional psychopaths. *Journal of Consulting and Clinical Psychology*, 45, 674-683.
- Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature: The definitive study of the causes of crime*. New York: Simon & Schuster.
- Zachary, R. A. (1986). *Shipley Institute of Living Scale: Revised manual*. Los Angeles: Western Psychological Services.

Received March 12, 1992

Revision received April 2, 1992

Accepted April 2, 1992 ■