Psychopathic Personality Traits and Temporal Perspective: A Test of the Short Time Horizon Hypothesis

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A number of authors have proposed that psychopathic individuals possess an abnormally constricted time horizon (i.e., foreshortened sense of the future). This hypothesis was tested among 101 undergraduates, who were administered a battery of (1) self-report indices of psychopathic personality traits, antisocial behavior, and normal-range personality traits; (2) self-report indices of time perspective; (3) projective tests of time perspective; and (4) laboratory tasks assessing time estimation and capacity for foresight and impulse control. Measures of psychopathy/antisocial behavior tended to be negatively correlated with several self-report indices assessing preoccupation with the future and with a projective task assessing the frequency of thoughts concerning future events, although only one of the correlations with this latter task was significant. In most cases these correlations were not attributable to the variance shared by measures of psychopathy/antisocial behavior and measures of (low) anxiety-proneness, although several correlations decreased substantially after levels of harmavoidance were controlled. In contrast, measures of psychopathy/antisocial behavior were negligibly correlated with laboratory tasks. These results provide mixed support for the short time horizon hypothesis and suggest that further attention to the role of method factors in investigations of future time perspective is warranted.

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INTRODUCTION

The etiology of psychopathic personality (psychopathy) remains among the principal unresolved questions in psychopathology today (Hare, 1993; Lykken, 1995; Meloy, 1988). Foremost among models of psychopathy are theories positing a high fear threshold (Lykken, 1957), diminished autonomic arousal (Quay, 1965), role taking deficits (Gough, 1960), or abnormalities in response modulation (Patterson & Newman, 1993) (for a review see Doren, 1987). As delineated by Cleckley (1941/1982), psychopathy is characterized by a constellation of personality traits including guiltlessness, dishonesty, superficial charm, low anxiety, and failure to learn from punishing experiences. Although not all psychopaths engage in illegal behavior, the crimes they commit tend to lack long-term payoffs and clear-cut relations to life goals (Cleckley, 1941/1982).

One characteristic that features prominently in virtually all descriptions of psychopaths is an insouciant lack of concern regarding the consequences of their actions (Greenacre, 1945; Mealey, 1995; Shapiro, 1965). Accordingly, a number of theorists (e.g., Smith, 1985) have suggested that psychopaths possess a constricted future time perspective. Some authors have further posited that this constricted future time perspective increases psychopaths' risk for antisocial behavior. Miller (1964), for example, described character-disordered individuals (many of whom possess psychopathic traits), as "ahistoric." He argued that "the experience of the passage of time is one important dimension of his (the character-disordered individual's) existence which seems sharply impaired. In a certain sense, he seems to be walking through the snow without leaving footprints" (p. 535). Buss (1966) regarded the failure to "bind time" as one of three pathognomonic features of psychopathy: "He cannot wait... He has no sense of time, especially of the future, he senses only the here and now" (p. 435). More recently, Patterson and Newman (1993) argued that psychopaths suffer from deficits in "prospective reflectivity," i.e., the tendency to contemplate the potential consequences of one's behaviors.

Wilson and Herrnstein (1985) accorded the construct of "time discounting" a central role in their operant theory of criminality. According to Wilson and Herrnstein, individuals who discount time at rapid rates, i.e., who have a short future "time horizon," are at elevated risk for antisocial behavior because of their devaluation of the long-term sequelae of their actions. *Ceteris paribus*, such individuals should value crime more than others because of the lesser weight they place on future punishment. Because Wilson and Herrnstein's theory was developed to explain criminality, however, its relevance and specificity to psychopathy are unclear.

Despite the multitude of clinical descriptions of psychopaths' deficient time sense, few systematic investigations of this issue have been conducted. Moreover, most of these studies have been performed on criminals or delinquents, rather than psychopaths per se. Although psychopathy overlaps with antisocial behavior, the two constructs are not isomorphic. Many individuals who meet the DSM-IV (American Psychiatric Association, 1994) criteria for antisocial personality disorder (ASPD), which is a syndrome characterized by a chronic history of antisocial acts (e.g., theft, arson, rape) dating back to childhood or adolescence, appear not to possess the core features of psychopathy (Hare, Hart, & Harpur, 1991; Lilienfeld, 1994). Moreover, some individuals who possess the core features of psychopathy may not meet DSM-IV criteria for ASPD [i.e., "adaptive" or "subclinical" psychopaths (Sutker & Allain, 1983; Widom, 1977)]. Consequently, the generalizability of many of the studies reviewed below to psychopathy remains tenuous.

A number of investigators have used projective tasks to examine the time perspective of antisocial individuals. Barndt and Johnson (1955) found that delinquents exhibited a shorter future time perspective than nondelinquents on a task requiring participants to complete an ambiguous story about two boys going for a walk. Brock and Del Guidice (1963) reported similar results with the same story. Ricks, Umbarger, and Mack (1964) reported that, compared with randomly assigned untreated delinquents, delinquents who received an 11-month vocationally oriented intervention showed greater increases in future, but not past, time perspective on the Thematic Apperception Task (TAT).

Siegman (1961) asked age-matched delinquents and nondelinquents to list 10 events that might occur in the future and to estimate their age of occurrence. The ages estimated by delinquents were younger than those of nondelinquents, suggesting that the former group possesses a more constricted future time perspective. The interpretation of Siegman's findings is complicated, however, by the fact that delinquents tend to engage in many life activities (e.g., leaving home, having children) earlier than nondelinquents. Because Siegman did not provide information on the types of events listed by respondents, this alternative explanation cannot be ruled out.

Hess (1969) identified psychopathic prisoners based on elevated MMPI Psychopathic deviate (Pd) scores and subdivided them into primary and secondary (i.e., neurotic) groups based on their trait anxiety scores. He found that primary psychopaths were less likely to acknowledge that "doing things on time" or "keeping track of time" was important to them; moreover, they were less likely to own a watch. Contrary to prediction, primary psychopaths produced longer past and future temporal perspectives

on a task that required them to list five events in their past and future
and the age they were, or anticipated being, at the time of each event.
Hess also found that primary psychopaths traced a circle more quickly than
secondary psychopaths under both neutral (i.e., as accurately as possible)
and inhibition (i.e., as accurately *and* slowly as possible) conditions, al-
though this difference was not significant.

Several researchers have examined the extent to which temporal ma-
nipulations influence the performance of psychopaths on learning tasks.
Painting (1961) reported that the performance of psychopaths, but not
nonpsychopaths, deteriorated on a partial reinforcement task (which in-
volved pressing one of two levers) under conditions involving temporally
remote feedback. When feedback was immediate, psychopaths performed
as well as nonpsychopaths. Gullick, Sutker, and Adams (1976) found that
the performance of psychopaths, but not nonpsychopaths, on a paired-as-
sociate memory task was impaired by the inclusion of a time delay between
participants' responses and experimenter feedback. Although the results of
these two studies have been interpreted as reflecting psychopaths' difficulty
in mediating temporal intervals (Gorenstein & Newman, 1980), they may
instead be attributable to the lower motivation of psychopaths than nonpsy-
chopaths on tasks requiring vigilance or concentration.

Some investigators have reported that antisocial individuals perceive
time as passing slowly. This "slow internal clock" could lead to a propensity
toward boredom and to decreased concern with long-term goals. Siegman
(1961) reported that delinquents produced shorter estimates than nonde-
linquents on a measure of time perception requiring participants to click
a stopwatch when a given time interval had elapsed. Similarly, Laffey (1963)
found that impulsive (and presumably more psychopathic) prisoners pro-
duced briefer time estimates than nonimpulsive prisoners. Nevertheless, be-
cause Siegman's and Laffey's tasks involved motor production of time
intervals, their findings are potentially attributable to the greater impa-
tience or motor tempo of delinquent and impulsive participants. A task
involving verbal estimation of time intervals would help to exclude this pos-
sibility. Indeed, Widom and Newman (1985) found that, compared with
community subjects without ASPD, community subjects with ASPD tended
to overestimate how long it had taken them to perform various tasks (e.g.,
complete a personality test), suggesting that they subjectively perceived
these tasks as passing more slowly. (Note that the short time horizon hy-
pothesis predicts that psychopathic individuals will underestimate time in-
tervals on motor production tasks like those of Siegman and Laffey but
overestimate time intervals on verbal estimation tasks.)

A final line of research bearing on the relation between psychopathy
and future time perspective concerns the performance of psychopaths on

frontal lobe tasks. Because the prefrontal cortex is intimately involved in foresight, several authors (e.g., Gorenstein & Newman, 1980; Moore & Rose, 1995) have conjectured that psychopaths are characterized by frontal lobe deficits. Nevertheless, the results of studies examining the association between psychopathy and frontal lobe tasks have been equivocal (Kandel & Fried, 1989; Lilienfeld, 1992). For example, although Gorenstein (1982) found that psychopaths performed worse than nonpsychopaths on several frontal lobe measures, including the perseverative error score on the Wisconsin Card Sorting Task, the sequential Matching Memory Task, and an index of Necker Cube reversals, Hare (1984) failed to replicate these results despite selecting a more extreme group of psychopaths.

A frontal lobe task that has received considerable attention in the psychopathy literature is the Porteus Mazes Test (Porteus, 1965). This task, which consists of a series of mazes of increasing difficulty, yields both a quantitative or test age (TA) score and a qualitative (Q) score. The former indicates the number of mazes correctly completed, whereas the latter indicates the number of stylistic errors (e.g., crossing lines, cutting corners) ostensibly reflecting impulsivity. Delinquents have been found to obtain higher (i.e., poorer) Q scores than nondelinquents (Riddle & Roberts, 1977). Schalling and Rosen (1968) reported that criminals who met many of the Cleckley criteria for psychopathy obtained higher Q scores than other criminals. In contrast, Sutker, Moan, and Swanson (1972) found that MMPI-defined psychopathic prisoners obtained significantly *lower* Q scores than other prisoners. Thus, the relation between psychopathy and Porteus Q scores requires clarification.

The primary purposes of the present investigation were twofold. First, we examined the hypothesis that individuals with high levels of psychopathic personality traits exhibit a shorter time horizon than other individuals. This hypothesis is only correlational: even if corroborated, it would not necessarily imply that a short time horizon is causally related to the core features of psychopathy. This hypothesis is equally consistent with the possibility that a short time horizon is a consequence of one or more of the core features of psychopathy (e.g., low anxiety).

Because most studies in this literature have relied on a single mode of assessment of time perspective and perception, we tested this hypothesis by means of self-report, projective, and laboratory measures. In addition, we administered both global measures of psychopathy and measures of specific facets of psychopathy (e.g., fearlessness, impulsivity); the latter indices were included to determine which components of psychopathy were most relevant to future time perspective. Although our principal hypothesis concerns psychopathy, we also administered indices of antisocial behavior in light of the covariation between psychopathy and ASPD (Hare *et al.,* 1991).

Multiple indices of psychopathy and antisocial behavior were included in light of findings (Hare, 1985; Hundleby & Ross, 1977; Widom & Newman, 1985) that self-report measures of psychopathy and related conditions tend to be weakly or at best moderately intercorrelated, raising the possibility that they contain nonredundant information. In addition, because there is evidence (Lilienfeld, 1996) that at least some self-report psychopathy indices (e.g., the MMPI-2 Pd and Antisocial Practices Content Scales; see *Measures*) possess different personality correlates, we wished to examine the possibility that these indices differ in their relations with time perspective measures.

To examine both the discriminant and the convergent relations of time perspective tasks with other measures, we administered measures of normal-range personality traits in addition to indices of psychopathy and antisocial behavior. We predicted that normal-range personality traits relevant to psychopathy (e.g., impulsivity, fearlessness) would correlate moderately to highly with measures of future time perspective but that traits largely irrelevant to psychopathy (e.g., propensity toward positive affect, absorption in imaginative experiences) would not.

Second, we examined the extent to which the relations between psychopathy and time horizon measures are mediated by low levels of anxiety. Because psychopaths are less anxiety-prone than other individuals (Lykken, 1995) and because thoughts concerning the future are frequently tinged with anxious anticipation, it could be argued that any correlations between psychopathic traits and measures of future time perspective are attributable to the variance shared by both sets of measures with anxiety-proneness. To examine this hypothesis, we administered indices of both fearfulness and trait anxiety. These two constructs represent conceptually and empirically (Watson & Clark, 1984) different types of anxiety-proneness. Fearfulness is a sensitivity to signals of threat, whereas trait anxiety is a chronic perception that threat is unavoidable (Tellegen & Waller, 1996).

We examined these hypotheses in an undergraduate sample. Although undergraduates have the potential disadvantage of relatively low rates of antisocial behavior, they have the advantage of being relatively free from the effects of substance dependence, depression, and other Axis I conditions that can distort the reporting of longstanding personality traits (Loranger et al., 1991). In addition, recent taxometric analyses indicate that the core personality traits of psychopathy appear to be underpinned by a latent dimension (Harris, Rice, .& Quinsey, 1994), suggesting that these traits are nomothetically relevant in both nonclinical and clinical samples.

METHOD

Participants

The participants were 104 undergraduates recruited from introductory psychology courses who received partial course credit for their participation. Three participants were excluded because of elevated scores on the Deviant Responding (DR) (>21) and Variable Response Inconsistency (VRIN) (>45) validity scales of the Psychopathic Personality Inventory (see Measures), leaving 101 participants for the analyses reported here. Their mean age was 18.89 (SD = 2.58); 61 participants were female, 39 were male, and 1 neglected to record his or her gender. Sixty-three participants were White, 13 were African-American, 15 were Asian-American, and 5 were Latino; the remaining 5 reported their ethnicity as "other."

Procedure

Participants were tested individually by a research assistant in sessions lasting approximately 2.5 hr. The order of administration was as follows: (1) self-report indices (including measures of psychopathic personality traits, antisocial behavior, and normal-range personality dimensions and the Recent Thoughts Inventory, a self-report projective measure), (2) Porteus Mazes, (3) modified TAT, (4) time estimation task, and (5) circle tracing task.

Measures

Self-Report Indices of Psychopathy and Antisocial Behavior

Psychopathic Personality Inventory (PPI). The PPI (Lilienfeld & Andrews, 1996) consists of items with a 1–4 Likert-type format and was designed to assess the personality features of psychopathy delineated by Cleckley (1941/1982) and others (e.g., Hare, 1990). In addition to a total score, which is interpretable as a global index of psychopathy, the PPI contains eight factor analytically derived subscales that assess different facets of psychopathy. The PPI subscales, along with one sample item from each subscale, are displayed in Table I.

The PPI contains two validity scales. The first, the DR scale, consists of 10 items with extremely low endorsement frequencies and is intended to assess malingering and careless or random responding This scale was

Table I. PPI Subscales and Sample Items

Machievellian Egocentricity (30 items)
  I always look out for my own interests before worrying about those of the other guy.
    (True)
Social Potency (24 items)
  Even when others are upset with me, I can usually win them over with my charm. (True)
Coldheartedness (21 items)
  I have had "crushes" on people that were so intense that they were painful. (False)
Carefree Nonplanfulness (20 items)
  I often make the same errors in judgment over and over again. (True)
Fearlessness (19 items)
  Making a parachute jump would really frighten me. (False)
Blame Externalization (18 items)
  I usually feel that people give me the credit I deserve. (False)
Impulsive Nonconformity (17 items)
  I sometimes question authority figures "just for the hell of it." (True)
Stress Immunity (11 items)
  I can remain calm in situations that would make many other people panic. (True)

designed to be relatively independent of psychopathology in that it consists of items that, although bizarre, are not characteristic of any known form of psychological disturbance (e.g., "When I am under stress, I sometimes see large, red, rectangular shapes moving in front of my eyes"). The second, the VRIN scale, which was modeled after Tellegen's (1978/1982) VRIN scale and the MMPI-2 VRIN scale (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989), consists of item pairs with relatively high ($r > .30$) intercorrelations. Scores on the VRIN scale are calculated by taking the absolute value of the difference between the items in each pair and then summing across pairs. The VRIN scale is designed to detect careless or inconsistent responding (see Tellegen, 1988). High scores on the DR and VRIN scales were used to exclude potentially invalid protocols.

The PPI and its subscales exhibit good internal consistencies; across several undergraduate samples, alphas for the total score have ranged from .90 to .93, and alphas for the subscales have ranged from .70 to .89 (Lilienfeld & Andrews, 1996). In addition, the PPI total score exhibits encouraging convergent and discriminant validity with self-report, psychiatric interview, peer rating, and family history indices of personality disorders and personality traits. For example, the PPI correlates $r = -.59$ with the CPI Socialization (So) scale, $r = .55$ with Spielberger, Kling, and O'Hagan's (1978) MMPI-derived Sociopathy Scale, $r = .59$ with DSM-III-R ASPD as assessed by structured interview, and $r = .45$ with peer rated-Cleckley psychopathy. In addition, the PPI has low correlations with measures of social desirability, depression, and schizotypy (see Lilienfeld, 1990; Lilienfeld & Andrews, 1996).

Pd Scale. This measure was developed by McKinley and Hathaway (1944), who contrasted the responses of hospitalized individuals with "psychopathic personality, asocial and amoral type" (p. 167) with those of normals. The Pd scale, particularly in conjunction with self-report indices of anxiety, has been found to discriminate between individuals who do and do not learn from punishment (Newman, Widom, & Nathan, 1985). Although the Pd scale correlates moderately with measures of antisocial behavior, its correlations with measures of Cleckley psychopathy are generally low (Harpur, Hare, & Hakstian, 1989).

Antisocial Practices (ASP) Content Scale. The ASP scale is an MMPI-2 content scale constructed by Butcher *et al.* (1990), who rationally selected a set of MMPI items assessing "antisocial ideas and practices" and then removed items exhibiting low correlations with this composite. Among males, the ASP scale correlates positively with spousal ratings of drug use, legal problems, and profanity; among females, it correlates positively with spousal ratings of physical threats and dishonesty (Butcher *et al.,* 1990).

ASPD Scale. This scale was developed by Morey, Waugh, and Blashfield (1985), who rationally selected items from the MMPI to assess the DSM-III (American Psychiatric Association, 1980) criteria for ASPD. This scale shows a promising pattern of convergent and discriminant validity with the MMPI clinical scales (Morey *et al.,* 1985), and distinguishes patients with ASPD from those with other personality disorders (Morey, Blashfield, Webb, & Jewell, 1988). The scale administered here was the MMPI-2 version of the ASPD scale, which contains two fewer items than the original MMPI version (Colligan, Morey, & Offord, 1994).

Psychopathy Scale. The Psychopathy scale was developed by selecting MMPI items that load highly on a delinquency factor identified in factor analyses of the MMPI item pool (Nichols, 1989). Among psychiatric patients, the Psychopathy Scale correlates $r = .60$ with the MMPI Pd scale and $r = .55$ with both the Wiggins' (1966) Authority Conflict and Manifest Hostility content scales (Nichols, 1989).

So Scale. This measure was designed by Gough (1960) to assess the role-taking deficits typical of psychopathy, and was constructed by contrasting the responses of delinquents and nondelinquents. The So scale rank orders a variety of criterion groups along a putative continuum of socialization (Gough, 1960; for a review see Gough, 1994). High scores on the So scale reflect lower propensities toward psychopathy; in the analyses reported here, however, scores on the So scale are reversed to facilitate comparison with other measures of psychopathy and antisocial behavior.

Cleckley Scale. This measure was rationally constructed by Levenson (1990) to assess the Cleckley criteria for psychopathy. This scale correlates positively with self-report measures of disinhibition, boredom proneness,

and substance use risk and negatively with self-reported empathy (Levenson, 1990).

PDQ-R ASPD Scale. This scale was rationally constructed by Hyler and Reider (1987) to assess the DSM-III-R (American Psychiatric Association, 1987) criteria for ASPD. The PDQ-R ASPD scale exhibits moderate intraclass correlations (.46) with dimensional ASPD scores derived from structured interviews (Hyler, Skodol, Kellman, Oldham, & Rosnick, 1990). Because the PDQ-R scales are better thought of as screening than as diagnostic measures (Hyler, Skodol, Oldham, Kellman, & Doidge, 1992), this measure was analyzed using dimensional scores only.

Wender–Utah Rating Scale (WURS). This scale was developed by Ward, Wender, and Reimherr (1993) to assess the extent to which respondents possessed symptoms of attention-deficit/hyperactivity disorder (ADHD) in childhood. Respondents are provided with a list of ADHD symptoms (e.g., "always on the go") and asked to rate retrospectively how well each symptom described them as a child. In this study, the brief version of the WURS, which consists of the 25 items that best distinguish between ADHD and non-ADHD children, was administered. The WURS correlates moderately with parental ratings of ADHD symptoms in adults, and predicts responsivity to stimulant medication (Ward *et al.,* 1993). The WURS was administered in light of findings that childhood ADHD is a risk factor for adult antisocial behavior (Lilienfeld & Waldman, 1990) and theoretical conjectures that ADHD individuals possess a foreshortened future time perspective (Barkley, 1994).

Self-Report Measures of Normal-Range Personality Traits

MPQ Short Form. The MPQ scales were assessed by means of a rating measure developed by Tellegen (1978/1582) to approximate the full MPQ scales. This measure consists of 33 items, with three items for each of the 11 lower-order scales (see below). Scores on the three higher-order scales were calculated by unit weighting and summing scores on the lower-order scales that lead most highly on each higher-order dimension. The full MPQ scales have demonstrated a promising pattern of convergent and discriminant correlations with peer ratings (Tellegen & Waller, 1996) and theoretically meaningful relations with the MMPI clinical scales (DiLalla, Gottesman, Carey, & Vogler, 1993).

The MPQ consists of three essentially orthogonal higher-order dimensions derived from factor analyses of the 11 lower order dimensions: Positive Affectivity (PA), Negative Affectivity (NA), and Constraint (CN), which correspond to the "Big Three" dimensions identified in many broad-band

measures of personality (Waller, Lilienfeld, Tellegen, & Lykken, 1991). PA is an enduring propensity to experience positive affects of many kinds (e.g., emotional well-being), whereas NA is an enduring propensity to experience negative affects of many kinds (e.g., anxiety). CN is a fearfulness or impulse control dimension that appears to map onto the construct of behavioral inhibition (Gray, 1982). The internal consistencies (Cronbach's alphas) of the three MPQ higher-order scales ranged from .71 to .84 in this sample.

The MPQ also consists of 11 lower-order scales derived from item-level factor analyses. Wellbeing, Social Potency, Social Closeness, and Achievement load primarily on PA, Stress Reaction, Alienation, and Aggression load primarily on NA, and Harmavoidance, Control (vs. Impulsiveness), and Traditionalism load primarily on CN; Absorption does not load primarily on any single higher-order factor. Two MPQ subscales are especially relevant to anxiety-proneness and were used in analyses examining the extent to which the relations between measures of psychopathy and future time perspective are attributable to (low) anxiety. Specifically, Stress Reaction is closely related to trait anxiety, whereas Harmavoidance is closely related to fearfulness (Tellegen & Waller, 1996). The internal consistencies (Cronbach's alphas) of all but two of the MPQ lower-order scales ranged from .61 to .85. The exceptions were Wellbeing and Traditionalism, for which alphas were .43 and .42, respectively.[3]

Eysenck Impulsivity Scale. This measure was developed by selecting items with high loadings on several lower-order impulsivity factors in male and female samples (Eysenck & Eysenck, 1977) and correlates positively with the extraversion and psychoticism scales of the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1976). The internal consistency of this scale was .90.

Self-Report Measures of Time Perspective

Time Attitudes Scale (TAS). The TAS was developed by Calabresi and Cohen (1968), who factor analyzed a rationally derived set of items assessing time orientation. The TAS contains four subscales (from which one sample item each is provided): (1) *Time Anxiety,* which assesses concerns regarding the passage of, and inability to control, time: "It makes me a little uncomfortable to think about my future" (True), (2) *Time Submissiveness,* which assesses a tendency to subordinate one's activities to time demands: "I often put things off to the last minute and then rush to get them

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[3]Because the MPQ short form was added to the battery after approximately one-fifth of the participants had been run, the sample sizes for analyses involving the MPQ scales are somewhat smaller than those for the other analyses.

done on time" (False); (3) *Time Possessiveness*, which assesses negative feelings concerning the rapid passage of time: "It bothers me to think how fast time goes" (True); and (4) *Time Flexibility*, which assesses a relaxed and lenient attitude toward time: "It is fun to plan for the future, even though the plans may not work out" (True).

The TAS subscales correlate in theoretically meaningful ways with various personality traits. For example, the Time Anxiety subscale correlates positively with a measure of restlessness, while the Time Flexibility subscale correlates positively with a measure of excitement seeking (Calabresi & Cohen, 1968). The internal consistencies of the four TAS subscales were .57, .62, .15, and .48, respectively. Because of the extremely low internal consistency of the Time Possessiveness subscale, this subscale was excluded from all subsequent analyses.

Future Time Orientation (FTO) Scale. This scale, constructed by Gjesme (1979), is a modification of a measure by Heimberg (1963) assessing preoccupation and psychological engagement with the future. Sample items from the FTO scale are "I have been thinking a lot about what I am going to do in the future" (T) and "I am not so very much concerned about things a little ahead in time" (F). The FTO scale distinguishes students with high versus low achievement motivation (Gjesme, 1979). The internal consistency of the FTO scale was .52.

Death Anxiety Scale (DAS). The DAS was developed by rationally constructing a pool of items that assesses fears and concerns regarding death and by excluding items with low item–total correlations (Lonetto & Templer, 1986). Sample items from the DAS are "I am very much afraid to die" (T) and "I often think about how short life really is" (T). The DAS has been reported to correlate significantly ($r = -.24$) with the Pd scale (Lonetto & Templer, 1986). The internal consistency of the DAS was .69.

Projective Measures of Time Perspective

Recent Thoughts Inventory (RTI). This measure was adapted into a self-report format by modifying an interview index of time perspective developed by Eson and Greenfeld (1962). Participants were asked to list 15 thoughts that they had during the past week and to record whether each thought referred to an event in (1) the distant past (more than 2 days before the thought), (2) the near past (less than 2 days before the thought), (3) the near future (less than 2 days after the thought), or (4) the distant future (more than 2 days after the thought). The mean score across all 15

items was used in analyses; higher scores reflect greater future preoccupa-
tion. The internal consistency of the RTI was .52. The RTI was classified
as a projective measure because respondents were permitted to select any
thoughts during the past week that came to mind.

Modified TAT. This modified version of the TAT (Morgan & Murray,
1935) was developed for the purpose of this study. The cards were selected
on the basis of their judged (1) capacity to elicit themes relevant to future
time perspective and (2) relevance to college students. Four TAT cards were
used: 1 (boy with violin), 4 (young woman placing arms around young man),
8GF (young woman thinking), and 12 (boat next to lake). In addition, a
fifth card (student seated at his desk with an open book in front of him)
was taken from McClelland (1953), who used this stimulus to assess
achievement motivation.

As in the original TAT, participants were asked to describe what led
up to the events in the picture, what was occurring in the picture, what
would happen in the future, and (where relevant) what the characters
were thinking and feeling. If necessary, participants were prompted with
two questions ("When does your story begin?" and "When does your
story end?") to elicit more detailed information concerning both prospec-
tive (future) and retrospective (past) time perspective. Both prospective
and retrospective time span scores, which were obtained by taking the
mean scores across all five cards, were used in analyses. Although no
predictions were made concerning the relation of retrospective time span
to psychopathy, this variable was included to examine whether time per-
spective abnormalities among psychopathic individuals were specific to
the future.

All TAT protocols were tape recorded. The scoring scheme for the
modified TAT assessed time extension (Wallace & Rubin, 1960), i.e., the
length of time span reported, and was modeled closely after Ricks *et al.*
(1963). Prospective time span was scored on a 1–11 scale, where 1 = less
than an hour and 11 = life span. Retrospective time span score was scored
on a 1–10 scale, where 1 = less than an hour and 10 = more than a decade
ago. The internal consistencies of the prospective and retrospective time
span scores were .65 and .55, respectively. A randomly selected subset of
16 tapes was coded by one of the authors (T.H.), who was blind to all
information collected on each participant. The interrater reliabilities (in-
traclass correlations) of the prospective and retrospective time span scores
were 1.00 and .99, respectively. The correlation between prospective and
retrospective time span was $r = .51$, perhaps reflecting individual differ-
ences in the overall expansiveness of stories.

Laboratory Measures of Time Estimation and Impulsivity

Porteus Mazes. As noted earlier, this task is sensitive to frontal lobe dysfunction and assesses foresight and planning (Porteus, 1953). Both the TA and the Q score were used in analyses.

Time Estimation Task. Time estimation was assessed in two ways: (a) production and (b) verbal estimation. Prior to this task, participants wearing watches were asked to remove them. In each condition, participants were asked to estimate a pseudo-random set of 10 time intervals totaling 100 sec. In the first, *production*, condition, participants started the stopwatch at their discretion and stopped it whenever they believed each time interval had elapsed. In the second, *verbal estimation*, condition, the researcher started and stopped the stopwatch in view of the participant, and the participant was asked to estimate verbally each time interval to the nearest second. This condition was included to rule out the possibility that any positive findings in the production condition were due to impatience or motor tempo. Within each condition, scores on the 10 trials were averaged. The internal consistencies of the production and estimation conditions were .91 and .95, respectively. The correlation between scores in the two conditions was $r = -.68$ ($p < .001$).

Circle Tracing Task. In this final task in the session, participants were asked to use a pencil to trace two circles (5 and 10 in. in diameter, respectively) under two instructional conditions. In the first, *neutral*, condition, participants were asked to trace the circles as accurately as possible. In the second, *inhibition*, condition, they were asked to trace the circles as accurately and slowly as possible. Significant correlations between impulsivity and circle tracing under inhibition conditions have generally been found only when the inhibition condition is preceded by a neutral condition (Bachorowski & Newman, 1990). On top of each circle, the words "Start" and "Finish," separated by a solid black line, were prominently displayed. The inclusion of salient goals or end points has been reported to increase the correlation between performance on circle tracing tasks and measures of impulsivity (Bachorowski & Newman, 1990). Immediately prior to the circle tracing task, participants were informed that it was the final procedure in the testing session. This information was provided to increase the likelihood that impulsive participants would perceive the completion of this task as a salient incentive or end point.

A maximum of 5 min was allotted for each trial. Within each condition, scores on the two trials were averaged. The mean time for the neutral condition was 32.91 sec, whereas the mean time for the inhibition condition

was 89.58 sec; scores in these two conditions were correlated at $r = .40$ ($p < .001$).

RESULTS

Zero-Order Correlations Among Measures of
Psychopathy/Antisocial Behavior

The correlations among the nine measures of psychopathy/antisocial behavior ranged from $r = .39$ to $r = .83$ (all r's significant at $p < .001$), suggesting that these indices, although not interchangeable, assess overlapping aspects of the same construct.

Zero-Order Correlations Between Measures of
Psychopathy/Antisocial Behavior and Self-Report Indices
of Time Perspective

The zero-order correlations between the measures of psychopathy/antisocial behavior, on the one hand, and the self-report indices of time perspective, on the other, are displayed in Table II. In this and the remaining tables, statistically significant correlations are listed both before and after Bonferroni correction. Bonferroni-corrected alpha levels were obtained by dividing the original critical alpha level ($p = .05$) by the number comparisons in each table. In the text to follow, "significant" correlations are those surpassing the original critical alpha level. The reader should bear in mind, however, that the findings reported in the text are less conservative statistically than the Bonferroni-corrected findings reported in the footnotes to each table.

It can be seen in Table II that all correlations between the measures of psychopathy/antisocial behavior and the TAS Time Anxiety subscale were positive, and several were significant. All correlations between the measures of psychopathy/antisocial behavior and the TAS Time Submissiveness subscale were negative and significant. In contrast, the correlations between the measures of psychopathy/antisocial behavior and the TAS Time Flexibility subscale were negligible and nonsignificant.

All correlations between the measures of psychopathy/antisocial behavior and the FTO scale were negative and significant. Although virtually all correlations with the DAS were negative, only those with the PPI, MMPI-2 Psychopathy Scale, and PDQ-R ASPD Scale were significant.

Table II. Zero-Order Correlations Between Measures of Psycho-
pathy/Antisocial Behavior and Self-Report Indices of Time Perspective

| | TAS subscale | | | | |
	Anx	Sub	Flex	FTO	DAS
PPI	.05	**-.51***	-.02	**-.45***	-.25*
MMPI-2 scale					
Pd	**.34***	**-.31**	.00	-.28**	-.07
ASP	.24*	-.28**	-.05	-.22*	-.11
ASPD	.13	**-.44***	-.13	-.25**	-.16
Psychopathy	.09	**-.51***	-.06	**-.38***	-.26*
Cleckley scale	.26**	**-.31**	.10	**-.33***	-.12
So scale	.23*	**-.40***	-.12	-.30**	-.15
PDQ-R ASPD	.06	**-.34***	-.11	-.32**	-.21*
WURS	.28**	**-.35***	-.05	**-.31***	.01

Note. N = 101. The So scale has been reversed in scoring to facilitate
comparison with the other measures of psychopathy and antisocial
behavior. Correlations with an absolute value of r = .32 or greater
are significant following Bonferroni correction, and are in boldface.
PPI—Psychopathic Personality Inventory; Pd—Psychopathic deviate
scale; ASP—Antisocial Practices scale; ASPD—Antisocial Personality
Disorder scale; So—Socialization; PDQ-R ASPD-Personality Diag-
nostic Questionnaire—Revised Antisocial Personality Disorder scale;
WURS—Wender-Utah Rating Scale; TAS-Time Anxiety Scale;
Anx—Anxiety; Sub—Submissiveness; Flex-Flexibility; FTO—Future
Time Orientation; DAS—Death Anxiety Scale.
*p < .05.
**p < .01.
***p < .001 (two-tailed).

Table III shows the correlations between different facets of psycho-
pathy (as assessed by the PPI subscales) and the self-report measures of
future perspective. The PPI Blame Externalization subscale was signifi-
cantly positively correlated with the TAS Time Anxiety subscale, whereas
the PPI Stress Immunity subscale was significantly negatively correlated
with this subscale. Several PPI subscales, particularly Machievellian Ego-
centricity, Carefree Nonplanfulness, Fearlessness, and Impulsive Noncon-
formity, were significantly negatively correlated with the TAS Time
Submissiveness subscale. The PPI Coldheartedness and Carefree Nonplan-
fulness subscales were significantly negatively correlated with the TAS Time
Flexibility subscale.

Several PPI subscales, especially Machievellian Egocentricity, Carefree
Nonplanfulness, and Fearlessness, were significantly negatively correlated
with the FTO scale. The PPI Coldheartedness, Fearlessness, and Stress Im-
munity subscales were significantly negatively correlated with the DAS.

Table III. Correlations Between Psychopathy Facets and
Self-Report Indices of Time Perspective

PPI subscale	TAS subscale			FTO	DAS
	Anx	Sub	Flex		
Machego	.06	**-.40***	-.07	**-.41***	-.10
Socpot	-.14	-.26**	.19	-.12	-.17
Coldheart	-.15	.02	**-.34***	-.04	-.30**
Nonplan	.09	**-.54***	-.28**	**-.42***	-.13
Fearless	.11	**-.41***	.14	**-.46***	-.30**
Blamext	**.39***	-.22*	.02	-.26**	.12
Impnon	.05	**-.50***	.11	-.30**	-.13
Stressimm	-.29**	-.11	-.06	-.06	-.29**

Note. N = 101. Correlations with an absolute value of r = .32 or greater are significant following Bonferroni correction, and are in boldface. PPI—Psychopathic Personality Inventory; Machego—Machievellian Egocentricity; Socpot—Social Potency; Coldheart—Coldheartedness; Nonplan—Carefree Nonplanfulness; Fearless—Fearlessness; Blamext—Blame Externalization; Impnon—Impulsive Nonconformity; Stressimm—Stress Immunity; Anx—Anxiety; TAS—Time Anxiety Scale; Sub—Submissiveness; Flex—Flexibility; FTO—Future Time Orientation; DAS—Death Anxiety Scale.
*p < .05.
**p < .01.
***p < .001 (two-tailed).

Zero-Order Correlations Between Measures of Personality Traits and Self-Report Indices of Time Perspective

Table IV displays the zero-order correlations between measures of personality traits and self-report indices of time perspective. The correlations between the personality measures and the TAS Time Anxiety subscale were low, although the correlations with the MPQ Wellbeing and MPQ Stress Reaction Scales were significant (the first negative, the latter positive). The MPQ higher-order dimension of CN, along with its lower-order markers, Harmavoidance, Control, and Traditionalism, was significantly positively correlated with the TAS Time Submissiveness subscale. The EPQ Impulsivity Scale was significantly negatively correlated with this subscale. The correlations with the TAS Time Flexibility subscale were low, although those with the MPQ higher-order dimension of PA, one of its lower-order markers, MPQ Social Closeness, the MPQ Absorption scale, and the EPQ Impulsivity scale were positive and significant.

MPQ CN and MPQ Harmavoidance were positively, and EPQ Impulsivity negatively, correlated with the FTO scale. The MPQ higher-order

Table IV. Correlations Between Measures of Personality Traits and
Self-Report Indices of Time Perspective

	TAS subscale				
	Anx	Sub	Flex	FTO	DAS
MPQ dimensions					
Higher-order					
PA	−.08	.08	.26*	−.11	−.09
NA	.21	−.17	−.06	−.02	.24*
CN	−.07	**.49***	.02	.27*	.20
Lower-order					
Wb	−.23*	.19	.20	−.04	−.08
SC	.08	.07	.27*	−.08	.19
SP	−.05	−.18	.02	−.19	−.20
Ach	−.08	.20	.15	.06	−.04
SR	.25*	−.10	.03	−.08	.23*
Agg	.00	−.21	−.07	−.06	.13
Alien	.20	−.06	−.09	.09	.15
Harm	−.03	**.39***	.10	.33**	.27*
Ctrl	−.12	**.49***	−.09	.18	.18
Trad	−.03	.34**	.02	.13	.00
Abs	.19	−.09	.22*	−.07	.07
EPQ Impulsivity	.19	**−.49***	.21*	**−.48***	−.08

Note. N = 84. Correlations with an absolute value of *r* = .39 or greater are
significant, following Bonferroni correction and are in boldface. MPQ—Mul-
tidimensional Personality Questionnaire; PA—Positive Affectivity; NA—
Negative Affectivity; CN—Constraint; Wb—Wellbeing; SC—Social
Closeness; SP—Social Potency; Ach—Achievement; SR—Stress Reaction;
Agg—Aggression; Alien—Alienation; Harm—Harmavoidance; Ctrl—Con-
trol; Trad—Traditionalism; Abs—Absorption; EPQ—Eysenck Personality
Questionnaire; TAS—Time Anxiety Scale; Anx—Anxiety; Sub—Submissive-
ness; Flex—Flexibility; FTO—Future Time Orientation; DAS—Death Anxi-
ety Scale.
p < .05.
**p* < .01.
***p* < .001 (two-tailed).

dimension of NA, one of its lower-order markers, MPQ Stress Reaction,
and the MPQ Harmavoidance Scale were significantly, although weakly,
correlated with the DAS.

Zero-Order Correlations Between Measures of Psychopathy/Antisocial Behavior and Projective Indices of Time Perspective

The zero-order correlations between measures of psychopathy/antisocial
behavior and projective indices of time perspective are shown in Table V.
None of the measures of psychopathy/antisocial behavior was significantly cor-
related with either the modified TAT Prospective or Retrospective time span

Table V. Correlations Between Global Measures of Psychopathy/
Antisocial Behavior and Projective Indices of Time Perspective

	Modified TAT time span index		
	Prospective	Retrospective	RTI
PPI	.15	.04	-.20
MMPI-2 scales			
Pd	-.10	-.07	-.21
ASP	-.09	-.13	.02
ASPD	.06	.02	-.17
Psychopathy	.16	.10	-.11
Cleckley scale	-.05	-.12	-.13
So scale	.03	.01	-.21
PDQ-R ASPD	.05	.08	-.16
WURS	.15	.07	-.31**

Note. N = 101. The So scale has been reversed in scoring to facili-
tate comparison with the other measures of psychopathy and an-
tisocial behavior. No correlations are significant following
Bonferroni correction. PPI—Psychopathic Personality Inventory;
Pd—Psychopathic deviate scale; ASP—Antisocial Practices scale;
ASPD—Antisocial Personality Disorder scale; So—Socialization;
PDQ—R ASPD-Personality Diagnostic Questionnaire-Revised
Antisocial Personality Disorder scale; WURS—Wender-Utah Rat-
ing Scale; TAT—Thematic Apperception Test; RTI—Recent
Thoughts Inventory.
*p < .05.
**p < .01 (two-tailed).

indices. The WURS was negatively and significantly correlated with the RTI.
Virtually all other correlations with the RTI were negative, although low; the
correlations with the Pd and So scales were marginally significant (p < .06).

With one exception, none of the PPI subscales was significantly cor-
related with either of the modified TAT time span indices; Carefree Non-
planfulness was significantly correlated with the TAT retrospective time
index (r = .23, p < .05). Of the PPI subscales, only PPI Blame Externali-
zation was significantly (r = -.28, p < .05) correlated with the RTI.

Zero-Order Correlations Between Personality Measures
and Projective Indices of Time Perspective

The MPQ Social Closeness scale was correlated negatively (r = -.24,
p < .05) with the modified TAT Retrospective time span index; none of
the other correlations between the measures of personality traits and the
TAT time span indices was significant. None of the personality trait mea-
sures was significantly correlated with the RTI.