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# Effect of a Longer Versus Shorter Test-Release Interval on Recidivism Prediction With the Psychological Inventory of Criminal Thinking Styles (PICTS)

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The General Criminal Thinking (GCT) score of the Psychological Inventory of Criminal Thinking Styles (PICTS) was correlated with recidivism data obtained on 284 released male federal prisoners. The sample was divided into those inmates who had been released within 24 months of having completed the PICTS (shorter test-release interval;  $n = 138$ ) and those inmates who had been released more than 24 months after having completed the PICTS (longer test-release interval;  $n = 146$ ), and recidivism was measured by subsequent arrests and convictions accrued during a 6- to 78-month follow-up. Although the GCT score successfully predicted release outcome in the shorter test-release interval group, it failed to predict release outcome in the longer test-release interval group. The theoretical and practical implications of these findings are discussed.

**Keywords:** *PICTS; criminal thinking; test-release interval; recidivism; prediction*

Predicting recidivism is important for several reasons. First, it allows judges, parole boards, and probation officers to assess the probability of an offender's repeating the criminal conduct for which he or she is appearing before the court, parole board, or probation office. Second, it affords clinicians and correctional administrators the opportunity to identify need and risk factors capable of informing intervention programs designed to improve an offender's chances of success on the streets. Third, recidivism prediction supplies community leaders and concerned citizens with information on how released offenders can best be transitioned back into the mainstream of society for the purpose of reducing release failure and controlling the mounting economic, social, and personal cost of crime. Fourth, distinguishing

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**Author's Note:** The assertions and opinions contained herein are the private views of the author and should not be construed as official or as reflecting the views of the Federal Bureau of Prisons or the U.S. Department of Justice. Please address correspondence, including requests for copies of the PICTS, to Glenn D. Walters, Psychology Services, FCI–Schuylkill, P. O. Box 700, Minersville, PA 17954-0700; e-mail: [gwalters@bop.gov](mailto:gwalters@bop.gov).

between variables that do and do not predict recidivism is of cardinal significance to forensic and correctional practitioners and researchers because of its ability to highlight key offender needs, identify salient offender risks, and establish core principles of crime commission for use in preventing future criminal activity.

Calculating effect sizes for 30 potential predictors of juvenile criminal recidivism, Cottle, Lee, and Heilbrun (2001) determined offense history was the single best predictor of reoffending. Family problems, delinquent peers, nonsevere pathology, ineffective use of leisure time, and conduct problems were also found to predict recidivism in the 23 studies included in the Cottle et al. meta-analysis. An earlier meta-analysis of the adult criminal recidivism literature identified criminal history, certain demographic variables (age, gender), and criminological needs as the top three predictors of recidivism in the 131 studies surveyed (Gendreau, Little, & Goggin, 1996). In a meta-analysis of 61 follow-up studies conducted between 1943 and 1995 on sex offender recidivism, Hanson and Bussière (1998) found no single variable sufficient to serve as a reliable predictor of recidivism in offenders convicted of rape, child molestation, and other forms of sexual predation, although age, minority status, prior criminality/delinquency, and a history of rape were the best predictors of nonsexual violent recidivism, whereas deviant sexual preferences, a sexual preference for children, and a diagnosis of severe psychological disorder were the best predictors of sexual recidivism.

The results of the previously reviewed meta-analyses show age and criminal history typically being the strongest predictors of recidivism in released offenders. There is evidence, however, that criminal attitudes and beliefs, also known as dynamic criminological needs, are also capable of predicting recidivism. In their meta-analysis of the adult recidivism literature, Gendreau et al. (1996) calculated an effect size for criminological needs (.18) equal to the effect size for criminal history (.17) and exceeding the effect size for age (.11). Self-report measures assessing criminal attitudes and beliefs like the Psychological Inventory of Criminal Thinking Styles (PICTS; Walters, 1995), Criminal Sentiments Scale (Andrews & Wormith, 1984), and Self-Appraisal Questionnaire (Loza, 1996) may consequently prove invaluable as predictors of rearrest, reconviction, and reincarceration. One of these measures, the PICTS, is a multiscale inventory designed to appraise criminal thought content and process. The 80 PICTS items are organized into 19 partially overlapping scales and a general score capable of assessing potentially important criminal thinking styles, criminal thinking factors, and criminal thinking content.

To be useful, a psychological measure should be both reliable and valid. One way to validate a psychological procedure is to assess its ability to predict a meaningful future outcome. A meaningful future outcome in the case of a procedure like the PICTS is release outcome or recidivism. Researchers in both the United States (Walters, 1997; Walters & Elliott, 1999) and England (Palmer & Hollin, 2004) have found the PICTS capable of predicting recidivism in individuals released from prison, although the effect is modest and cannot be traced to any one particular

PICTS thinking style scale. Results from the Palmer and Hollin (2004) study were particularly weak, although Walters (2005) contends this may have been because a dichotomized outcome measure was used. Employing both dichotomously and continuously defined indices of recidivism Walters (2005) uncovered evidence of incremental validity for the Entitlement scale relative to important demographic (age) and criminal history (prior arrests) variables in predicting dichotomously defined subsequent arrest and both the Entitlement and Cutoff scales achieved incremental validity relative to age and prior arrests in predicting continuously defined subsequent arrests. Recent research suggests the PICTS General Criminal Thinking (GCT) score provides the most reliable and stable predictive results available on the PICTS (Walters, 2007a, 2007b; Walters & Mandell, 2007).

Clinical prediction, by definition, requires a period of time between predictor assessment and outcome evaluation. Additional delay is built into recidivism prediction because assessments are conducted, decisions rendered, and paperwork completed several weeks to several months before an inmate is released from custody. What effect does a longer versus shorter interval between administration of the PICTS and commencement of the follow-up have on the PICTS's ability to predict recidivism? Palmer and Hollin (2004) avoided this question by administering the PICTS just prior to an inmate's release. Although Palmer and Hollin (2004) did not specify the instructions participants received prior to completing the PICTS, if participants were not assured anonymity in completing the PICTS then the predictive efficacy of the PICTS may have been hampered by a defensive test-taking set to the extent participants feared their responses could be used to retard their release date. If, on the other hand, participants were assured anonymity, then the generalizability of results to clinical settings, where anonymity cannot be assured, would be called into question. If the PICTS is measuring mutable thinking styles instead of immutable personality traits, then the PICTS should do a better job of predicting recidivism when the test-release interval is shorter (arbitrarily set at  $\leq 24$  months) than when the test-release interval is longer ( $> 24$  months).

## Method

### Participants

Participants were 284 male inmates previously housed in a medium security federal correctional facility located in the northeastern United States. The sample included all 137 inmates from the previous Walters (2005) investigation, although the follow-up period was extended by 23 months. At the time the PICTS was administered, participants ranged in age from 19 to 67 years ( $M = 34.60$ ,  $SD = 9.37$ ) and averaged 12.19 years of education ( $SD = 1.59$ ). The racial/ethnic breakdown was 38.7% White, 46.1% Black, 13.7% Hispanic, and 1.4% Asian/American Indian, and most participants listed their marital status as single (61.6%), with 24.3% characterizing

their current marital status as married, 13.4% as divorced or separated, and 0.7% as widowed. The modal confining offense for this sample was a drug crime (40.5%), followed by miscellaneous offenses like firearms violations and counterfeiting (25.4%), robbery (21.5%), violence (7.7%), and property crimes (4.9%).

## Measures

The PICTS is an 80-item self-report inventory designed to measure the eight thinking styles believed to support a criminal lifestyle. The standard PICTS protocol yields two 8-item validity scales—Confusion and Defensiveness; eight nonoverlapping 8-item thinking style scales—Mollification, Cutoff, Entitlement, Power Orientation, Sentimentality, Superoptimism, Cognitive Indolence, and Discontinuity; four nonoverlapping factor scales—Problem Avoidance, Interpersonal Hostility, Self-Assertion/Deception, and Denial of Harm; two nonoverlapping content scales—Current and Historical; and two composite scales—Proactive and Reactive Criminal Thinking. Each PICTS item is rated on a four-point scale with *strongly agree* ratings earning the respondent four points, *agree* ratings earning the respondent three points, *uncertain* ratings earning the respondent two points, and *disagree* ratings earning the respondent one point on the PICTS scale or scales to which the item is assigned; all eight Defensiveness items, however, are reverse scored (*strongly agree* = 1 point, *agree* = 2 points, *uncertain* = 3 points, *disagree* = 4 points). The PICTS variable employed in the present investigation was the GCT score, a compilation of all 64 thinking-style items. Reliability (internal consistency = .93, test–retest = .81-.93) and validity (correlations with release outcome = .23-.26) are adequate and research reveals the GCT to be the most consistent predictor of criminal justice outcome available on the PICTS (Walters, 2007b).

## Procedure

Participants were enrolled in a 10-week psychoeducational class titled Lifestyle Issues, the first phase of the three-phase Lifestyle Change Program (LCP). On entering the LCP, inmates sign a treatment contract in which psychological testing is listed as one of the components of the program. The PICTS (Version 4.0; Walters, 1995) is routinely administered at the beginning (pretest) and end (posttest) of the Lifestyle Issues class, although for the first several years of the LCP only the pretest PICTS was administered. Accordingly, the pretest administration of the PICTS was employed in this study. Program completion status did not correlate with any of the dependent or independent variables included in this study.<sup>1</sup> The 284 inmates who formed the present sample were released from 1 to 87 months ( $M = 30.05$ ,  $SD = 20.34$ ) after completing the PICTS; participation was limited to persons released 6 or more months before the end of the follow-up (December 2006) and length of follow-up ranged from 6 to 78 months ( $M = 29.96$ ,  $SD = 16.20$ ). Patently invalid profiles were removed from the sample: specifically, protocols with more than 10

unanswered items or extreme elevations on the Confusion validity scale ( $T$ -score  $> 100$ ), signifying gross inattention to item content. Four inmates who failed to answer more than 10 items on the PICTS and two inmates with  $T$ -scores higher than 100 on the Confusion validity scale were removed from the sample, resulting in a final sample of 284 participants.

The dependent variables for this study were organized as counts (e.g., number of subsequent arrests), dichotomies (e.g., presence or absence of a subsequent arrest), and durations (e.g., time in months between release and first arrest). Data collection began when the inmate was released from custody and covered all arrests, outstanding warrants for arrest, and convictions accrued during the follow-up. Technical parole and supervised release violations that did not involve new criminal conduct or lead to reincarceration were not defined as arrests for the purpose of this study. Outcome data were gathered from records maintained at the FBI's National Crime Information Center (NCIC). Of the 284 released inmates who served as participants in this study, 115 (40.5%) were arrested one or more times during the follow-up, 65 (22.9%) of which resulted in a conviction. NCIC data are often criticized for being incomplete, particularly when it comes to providing disposition information on various arrests and charges. The predictor variable for this study was the GCT score, whereas age and prior criminal arrests (as documented in the NCIC file) served as control variables. The sample was divided roughly in half to determine whether PICTS administered closer to release ( $\leq 24$  months) were more predictive of release outcome than PICTS administered further from release ( $> 24$  months).

## Statistical Analyses

Poisson class regression procedures were used to analyze the count data in this study (i.e., arrests and convictions). However, there are three issues a researcher must address before deciding which Poisson class procedure to use in a particular research situation: overdispersion, truncation/censoring, and excess zeros.<sup>2</sup> In the event the Poisson distribution is overdispersed (conditional variance  $>$  conditional mean), negative binomial regression should be used in place of standard Poisson regression.<sup>3</sup> Cameron and Trivedi's (1990) ordinary least squares regression procedure ( $t_{opt}$ ) and the significance of the dispersion parameter ( $\alpha$ ) are two ways to test for overdispersion. Truncated (loss of a portion of counts) or censored (collapsing a range of counts into a single value) distributions also require modification of the Poisson model. Finally, excess zeros can present a problem for Poisson class procedures. This possibility can be tested using the Vuong statistic ( $V$ ; Vuong, 1989). Values of  $V$  greater than  $+1.96$  favor the zero modified model, whereas values of  $V$  below  $-1.96$  favor rejection of the zero modified model.

Dichotomies of both outcome variables (arrests, convictions) were used to evaluate the degree of relationship (point-biserial correlation) between the GCT score and release outcome and the classificatory power (receiver operating characteristic [ROC]

analysis) of the GCT as a predictor of recidivism. Duration (time until arrest/conviction) was evaluated with the parametric Weibull loglinear survival model. The Weibull was selected because of its ability to accommodate both positive and negative duration dependence (Winkelmann, 2003). Because time at risk for recidivism differed across participants and Poisson and duration class regression procedures assume that time of exposure is equivalent across observations (Greene, 2003), the unstandardized coefficient of the natural log of the time at risk variable was fixed at 1.00 or -1.00 before being included in the negative binomial and Weibull survival regressions. These analyses were conducted using LIMDEP 8.0 (Greene, 2002).

## Results

In deciding which Poisson class procedure to implement with the count data collected for this study (arrests, convictions) overdispersion was tested using the  $t_{\text{opt}}$  and  $\alpha$  dispersion tests. Overdispersion was evident in the total arrest regressions of both groups: the  $\alpha$  dispersion statistic was significant in the shorter test-release interval group and the  $t_{\text{opt}}$  test and  $\alpha$  dispersion statistic were both significant in the longer test-release interval group ( $p < .05$ ). Because negative binomial regression normally provides a more conservative test of one's hypotheses than Poisson regression and the negative binomial distribution reduces to the Poisson distribution as  $\alpha$  approaches 0, the decision was made to apply negative binomial regression to all four count analyses. On the other hand, there was no evidence of truncation or censoring and the Vuong test was either inconclusive ( $V = -0.18$  to  $-0.73$ ) or recommended rejection of the zero-ordered model ( $V = -2.42$ ). Accordingly, the standard negative binomial regression model was utilized with the count outcomes (arrests, convictions) included in this study.

The results of negative binomial regression analysis of the arrest and conviction count data in which age, prior arrests, and the GCT score served as predictors are reproduced in Table 1 (shorter test-release interval group) and Table 2 (longer test-release interval group). By calculating the exponent of the  $x$ -standardized coefficient ( $M = 0$ ,  $SD = 1$ ; Long, 1997), it is possible to estimate the degree of change in the outcome measure with a one standard deviation change in a predictor variable. For instance, the exponent of the  $x$ -standardized coefficient for age in predicting arrests in the shorter test-release interval group (0.89) shows a one standard deviation increase in age leading to an 11% reduction (0.89-1.00) in arrests when all other variables in the equation are held constant. Conversely, a one standard deviation increase in the GCT score for participants in the shorter test-release interval group predicts a 28% rise in arrests (1.28-1.00) when all other variables are held constant.

Correlations between the GCT score and dichotomous (present, absent) measures of arrest and conviction only proved significant in the shorter test-release interval group. In this group, the GCT correlated .30 ( $p < .001$ ) with arrests and .22 ( $p < .01$ ) with convictions. Conversely, correlations between the GCT and dichotomized arrest

**Table 1**  
**Negative Binomial Regression Results for the Shorter Test-Release Interval Group**

Variable	Arrests					Convictions				
	$\beta$	SE	t	p	$\beta^s_x$	exp ( $\beta^s_x$ )	$\beta$	SE	t	p
Constant	-4.3679	.7653	-5.70	.0001			-6.1299	0.8442	-7.26	.0001
Age	-.0122	.0150	-0.82	.4137	-.118	.89	-0.0262	0.0166	-1.57	.1157
Prior arrests	.0569	.0202	2.82	.0048	.369	1.45	.0704	0.0209	3.37	.0007
GCT score	.0084	.0046	1.83	.0671	.244	1.28	.0160	0.0048	3.32	.0009
Log of risk	1.0000									
	fixed parameter									
							$\beta^s_x$			exp ( $\beta^s_x$ )
							-.253			.78
							.458			1.58
							.467			1.60

Note: Variable = predictor variable in the regression equation; age = chronological age; prior arrests = total number of documented arrests prior to release; GCT = Psychological Inventory of Criminal Thinking Styles, General Criminal Thinking score; log of risk = natural log of months at risk in the community during follow-up period;  $\beta^s_x$  = x-standardized coefficient; exp( $\beta^s_x$ ) = exponent of x-standardized coefficient.



Table 2  
Negative Binomial Regression Results for the Longer Test-Release Interval Group

Variable	Arrests					Convictions				
	$\beta$	SE	t	p	$\beta^s_x$	exp ( $\beta^s_x$ )	$\beta$	SE	t	p
Constant	-3.2241	1.1762	-2.74	.0061			-3.0793	1.6445	-1.87	.0611
Age	-.0651	.0241	-2.70	.0069	-.518	.60	-.1011	0.0380	-2.66	.0077
Prior arrests	.0793	.0349	2.27	.0231	.378	1.46	.0510	0.0551	0.92	.3548
GCT score	.0066	.0065	1.01	.3113	.152	1.16	.0076	0.0088	0.86	.3874
Log of risk	1.0000						fixed parameter			
							$\beta^s_x$			exp ( $\beta^s_x$ )
							-.918			.40
							.284			1.33
							.202			1.22

Note: Variable = predictor variable in the regression equation; age = chronological age; prior arrests = total number of documented arrests prior to release; GCT = Psychological Inventory of Criminal Thinking Styles, General Criminal Thinking score; log of risk = natural log of months at risk in the community during follow-up period;  $\beta^s_x$  = x-standardized coefficient; exp( $\beta^s_x$ ) = exponent of x-standardized coefficient.

**Table 3**  
**Receiver Operating Characteristic Curves for the PICTS GCT Score**  
**in the Shorter and Longer Test-Release Interval Groups**

Group	Outcome	AUC	SE	Sig.	95% CI
Shorter	Arrest	.674	.046	.001	.584-.764
	Conviction	.635	.048	.011	.541-.729
Longer	Arrest	.545	.052	.391	.443-.648
	Conviction	.585	.063	.212	.462-.709

Note: PICTS GCT score = Psychological Inventory of Criminal Thinking Styles, General Criminal Thinking score; Shorter = shorter test-release interval group ( $n = 138$ ); Longer = longer test-release interval group ( $n = 146$ ); Outcome = dichotomized outcome measure (present, absent); Arrest = presence or absence of an arrest during follow-up period; Conviction = presence or absence of an arrest leading to a conviction during follow-up period; AUC = area under the curve.

( $r_{pb} = .09$ ,  $p > .10$ ) and conviction ( $r_{pb} = .10$ ,  $p > .10$ ) outcomes proved nonsignificant in the longer test-release interval group.

A series of ROC curves plotted between the GCT score and two dichotomized outcome measures revealed modest but statistically significant area under the curve (AUC) figures for the shorter test-release interval group but not for the longer test-release interval group. Table 3 lists the AUC values obtained by the GCT, along with standard errors, significance levels, and 95% confidence intervals, for participants in the shorter and longer test-release interval groups.

Loglinear survival analysis was used to evaluate the capacity of the GCT score to predict the length of time between release and first arrest or conviction. The natural log of the number of months between release and the targeted event served as the dependent variable in this study, whereas the dichotomized outcome (presence or absence of recidivism) served as the censoring variable. Predictor variables for this study were age, prior arrests, GCT score, and the natural log of time at risk with its parameter fixed at  $-1.00$ . Results from the Weibull loglinear model show the GCT score effectively predicting both outcomes in the shorter test-release interval group (see Table 4) but neither outcome in the longer test-release interval group (see Table 5).

## Discussion

The current study sought to determine whether the predictive efficacy of the PICTS GCT score was influenced by the amount of time between administration of the PICTS and release from custody. Using both count and dichotomized measures of subsequent arrests and arrests leading to conviction, this study revealed the PICTS

**Table 4**  
**Weibull Loglinear Survival Model Results for the Shorter**  
**Test-Release Interval Group**

Variable	Arrest				Conviction			
	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	9.9298	1.0913	9.10	.0000	10.4789	1.4898	7.03	.0000
Age	.0348	0.0212	1.65	.0998	.0409	0.0311	1.58	.1144
Prior arrests	-.0926	0.0318	-2.92	.0036	-.1164	0.0357	-3.26	.0011
GCT score	-.0216	0.0071	-3.05	.0023	-.0209	0.0092	-2.26	.0236
Log of risk	-1.00 ————— fixed parameter							

Note: Variable = predictor variable in the regression equation; age = chronological age; prior arrests = total number of documented arrests prior to release; GCT = Psychological Inventory of Criminal Thinking Styles, General Criminal Thinking score; log of risk = natural log of months at risk in the community during follow-up period; Arrest = duration analysis of time until first arrest; Conviction = duration analysis of time until first arrest leading to conviction.

**Table 5**  
**Weibull Loglinear Survival Model Results for the Longer**  
**Test-Release Interval Group**

Variable	Arrest				Conviction			
	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>	$\beta$	<i>SE</i>	<i>t</i>	<i>p</i>
Constant	7.1747	1.4884	4.82	.0000	7.0929	2.0527	3.45	.0005
Age	0.0864	0.0296	2.91	.0036	.1303	0.0670	1.94	.0519
Prior arrests	-.1068	0.0428	-2.49	.0126	-.0938	0.0880	-1.07	.2864
GCT score	-.0081	0.0086	-0.94	.3477	-.0103	0.0116	-0.88	.3773
Log of risk	-1.00 ————— fixed parameter							

Note: Variable = predictor variable in the regression equation; age = chronological age; prior arrests = total number of documented arrests prior to release; GCT = Psychological Inventory of Criminal Thinking Styles, General Criminal Thinking score; log of risk = natural log of months at risk in the community during follow-up period; Arrest = duration analysis of time until first arrest; Conviction = duration analysis of time until first arrest leading to conviction.

GCT score to be effective in predicting recidivism in inmates who completed the PICTS within 24 months of the start of the follow-up period (i.e., release from prison) but not in inmates who completed the PICTS more than 24 months before release. In 7 out of 8 tests, the PICTS GCT score predicted recidivism and displayed incremental validity relative to age and prior arrests in the shorter test-release interval

inmates (test-release interval  $\leq 24$  months) and in the eighth test the results approached statistical significance. By contrast, there were no significant effects when GCT was used to predict future recidivism in longer test-release interval inmates (test-release interval  $> 24$  months). As predicted, there was evidence for the predictive efficacy of the PICTS GCT score only when the span between testing and release was 24 months or less. It would seem the PICTS, as is probably the case with most dynamic assessment procedures, does a better job of predicting short-term outcomes than it does of predicting long-term outcomes.

There are important theoretical and practical implications to the present results. The fact the PICTS GCT score successfully predicted recidivism several months to several years after being administered to participants may lead some readers to conclude the PICTS is measuring stable personality traits. The view adopted by lifestyle theory—the model on which the PICTS is based—is one in which the PICTS assesses thinking styles that appear trait-like by virtue of systemic reinforcement, fear of change, and environmental niche-seeking but that are actually responsive to environmental and maturational influences. Because the PICTS only reliably predicted recidivism when it was administered within 24 months of an inmate's release tends to support the view of the PICTS as a measure of something other than personality traits. On average, more events transpired in the group completing the PICTS more than 24 months before release than transpired in the group completing the PICTS within 24 months of release. Such events likely brought about changes in an individual's thinking and behavior, making the PICTS results produced by participants in the longer test-release interval group less effective predictors of future criminal outcomes than the PICTS results produced by participants in the shorter test-release interval group.

The implications of the present findings for practice may be even more important than the implications for theory. What needs to be understood about the PICTS is that the construct it is designed to measure, criminal thinking, changes over time. As such, there will be a point in time when the results of a PICTS evaluation are no longer valid. Clinicians and decision makers need to have some idea when the results of a PICTS evaluation have lost their potency. When an evaluation is conducted for classification or programming purposes, the clinician needs to know the results are sufficiently stable to characterize an inmate's basic risk and need patterns, at least up until the individual has completed the program. When an evaluation is conducted for sentencing or parole purposes, the decision maker needs to know how far into the future the PICTS can effectively predict behavior. Contrasting the sum of the average length of time between administration of the PICTS and release ( $M = 12.78$  months) and the average length of time between release and end of follow-up ( $M = 33.54$  months) for the shorter test-release interval group with the sum of the average length of time between administration of the PICTS and release ( $M = 46.37$  months) and the average length of time between release and end of follow-up ( $M = 26.58$  months) for the longer test-release interval group suggests PICTS results may be

useful for up to four years but then lose their potency after this and cannot be relied on after seven years.

The rates of arrest and conviction in the shorter test-release interval group were twice the rates of arrest and conviction in the longer test-release interval group. Consequently, the PICTS-recidivism correlation may simply have been higher in shorter test-release interval inmates because of greater variability in the recidivism outcome measures for participants in the shorter test-release interval group. Of course, if restricted variability was the principal cause of the low PICTS-recidivism correlation in the longer test-release interval group then this should have also been observed in the correlations between age and prior arrests and recidivism. However, age and prior arrests performed comparably in the shorter and longer test-release interval groups, demonstrating 4 out of 8 significant effects in multivariate analyses of the shorter test-release interval group and 5 out of 8 significant effects in multivariate analyses of the longer test-release interval group. Consequently, a more limited range of recidivism outcomes in the shorter test-release interval group probably does not account for the large discrepancy in predictive efficacy observed between the shorter and longer test-release interval groups included in this study.

As in the previous Walters (2005) investigation, the sample for the present study was composed exclusively of program participants. In neither of these studies did program involvement correlate significantly with the PICTS or any of the outcome measures employed in these studies. This just said, there may still be something unique about inmates who volunteer for prison programs, which makes generalizing their reactions and responses to other inmates difficult. Accordingly, the next phase of the research agenda will be to administer the PICTS to general population inmates at intake and compare the ability of the PICTS to predict both institutional adjustment and release outcome after age, prior criminal history, and established non-self-report risk-appraisal measures like the Psychopathy Checklist-Revised (Hare, 2003) and Level of Service Inventory-Revised (Andrews & Bonta, 1995) have been controlled and the time span between testing and prediction has been varied. Limited generalizability notwithstanding, the present findings show the PICTS being most effective in predicting recidivism outcomes within a four-year time frame and advise caution in using the PICTS to predict outcomes beyond seven years. Even the shorter test-release interval results were modest in magnitude, implying that the relationship between criminal attitudes, as measured by the PICTS, and criminal behavior, as measured by recidivism, is complex.

## Notes

1. Program completion status was coded as follows: 1 = did not graduate from Lifestyle Issues class; 2 = graduated from Lifestyle Issues class (phase I) but did not complete any advanced groups; 3 = graduated from Lifestyle Issues class (phase I) and at least one advanced group (phase II) but did not complete the relapse prevention group (phase III); 4 = completed all three phases of the Lifestyle Change Program. Program completion status correlated  $-.07$  ( $p > .10$ ) with arrests,  $-.05$  ( $p > .10$ ) with convictions, and  $-.01$  ( $p > .10$ ) with the General Criminal Thinking score.

2. Overdispersion is when the conditional variance of the Poisson/negative binomial model exceeds the conditional mean of the Poisson/negative binomial model. A truncated sample is where the independent and dependent (count) variables are lost for a portion of the distribution (e.g., all cases with 0 arrests); a censored sample is missing a dependent (count) variable for a portion of the distribution, which exists within a range rather than being completely lost to analysis (e.g., upper limit of 5 or more arrests). Excess zeros means there are more zero observations (no recidivism) than can be handled by the baseline model (Poisson or negative binomial).

3. The conditional mean is the mean of the Poisson/negative binomial model and the conditional variance is the variance of the Poisson/negative binomial model. When the conditional variance significantly exceeds the conditional mean, the distribution of counts is positively skewed or overdispersed. When the conditional mean significantly exceeds the conditional variance, the distribution of counts is negatively skewed or underdispersed.

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