Published in final edited form as:

J Crim Justice. 2015 ; 43(1): 12–19. doi:10.1016/j.jcrimjus.2014.11.001.

Does substance misuse moderate the relationship between criminal thinking and recidivism?

Michael S. Caudy, Ph.D.,

Department of Criminal Justice, University of Texas at San Antonio, 501 W. Cesar E. Chavez Blvd., San Antonio, TX 78207

Johanna B. Folk, M.A.,

Department of Psychology, George Mason University

Jeffrey B. Stuewig, Ph.D.,

Department of Psychology, George Mason University

Alese Wooditch, M.A.,

Department of Criminology, Law & Society, George Mason University

Andres Martinez, Ph.D.,

Department of Psychology, George Mason University

Stephanie Maass, M.A.,

Department of Criminology, Law & Society, George Mason University

June P. Tangney, Ph.D., and

Department of Psychology, George Mason University

Faye S. Taxman, Ph.D.

Department of Criminology, Law & Society, George Mason University

Abstract

Purpose—Some differential intervention frameworks contend that substance use is less robustly related to recidivism outcomes than other criminogenic needs such as criminal thinking. The current study tested the hypothesis that substance use disorder severity moderates the relationship between criminal thinking and recidivism.

Methods—The study utilized two independent criminal justice samples. Study 1 included 226 drug-involved probationers. Study 2 included 337 jail inmates with varying levels of substance use disorder severity. Logistic regression was employed to test the main and interactive effects of criminal thinking and substance use on multiple dichotomous indicators of recidivism.

© 2014 Elsevier Ltd. All rights reserved

michael.caudy@utsa.edu 210-458-2688 (Phone), 210-458-2608 (Fax). johannafolk@gmail.com. jstuewig@gmu.edu. awooditc@masonlive.gmu.edu. amarti37@gmu.edu. sainswo1@masonlive.gmu.edu. jtangney@gmu.edu. ftaxman@gmu.edu.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Results—Bivariate analyses revealed a significant correlation between criminal thinking and recidivism in the jail sample ($r = .18, p < .05$) but no significant relationship in the probation sample. Logistic regressions revealed that SUD symptoms moderated the relationship between criminal thinking and recidivism in the jail-based sample ($B = -.58, p < .05$). A significant moderation effect was not observed in the probation sample.

Conclusions—Study findings indicate that substance use disorder symptoms moderate the strength of the association between criminal thinking and recidivism. These findings demonstrate the need for further research into the interaction between various dynamic risk factors.

Keywords

substance use disorders; criminal thinking; risk reduction; recidivism; intervention

Introduction

Contemporary correctional approaches suggest that tailoring interventions to target the specific criminogenic needs of offenders will yield greater declines in offending than a one-size-fits-all approach that has served as the predominate correctional treatment paradigm over the past several decades (Andrews, Bonta, & Hoge, 1990; Andrews & Bonta, 2010). Although this targeted approach is theoretically-sound and practically appealing, it can be difficult to implement due to the reality that most offenders have multiple criminogenic needs and many have complex behavioral health problems (Taxman & Caudy, forthcoming). Other than the work of Andrews and Bonta (e.g., Andrews & Bonta, 2010), little empirical literature exists on how different criminogenic needs interact with each other and what specific criminogenic needs should be targeted during interventions when offenders have multiple needs that may all relate to their offending (Wooditch, Tang, & Taxman, 2014).

One criminogenic need that has emerged as a primary target of correctional interventions in recent years is antisocial or criminal cognitions (Lipsey, Landenberger, & Wilson, 2007). Criminal cognitions are the means by which people rationalize their deviant behavior, exhibit distorted thinking, or neutralize the negative consequences resulting from offending. These cognitions are the “attitudes, beliefs, and rationalizations that offenders use to justify and support their criminal behavior” (Walters, 2012a, p. 272). Antisocial cognitions are a “big four” criminogenic need identified by Andrews and Bonta (2010) as one of the most robust predictors of recidivism among dynamic risk factors. Several correctional interventions specifically target these cognitive processes (e.g., Thinking for a Change, Moral Reconation Therapy, Reasoning and Rehabilitation), and these and other cognitive-behavioral programs that target criminal thinking are increasingly relied upon as recidivism risk reduction strategies in the justice system (Hollin & Palmer, 2009; Lipsey et al., 2007; Polaschek, 2011; Travers, Mann, & Hollin, 2014).

Despite the prominence of criminal cognitions in correctional discourse and practice, extant empirical research finds that the strength of the relationship between criminal thinking/cognitions¹ and offending varies considerably across samples. A moderately robust relationship between criminal thinking and recidivism has been found in some studies utilizing offender populations (see Andrews & Bonta, 2010; Walters 2012a for meta-

analytic support), but not in other similar samples (Mills & Kroner, 1997; Simourd & Van De Ven, 1999; Taxman, Rhodes, & Dumenci, 2011). Given these mixed findings, researchers have begun to explore subgroup differences in levels of criminal thinking and potential moderators (e.g., race, education level) of the relationship between criminal thinking and recidivism. Mandracchia and Morgan (2012) found that younger offenders, less educated offenders, and minority offenders generally endorsed higher levels of criminal thinking relative to older, more educated, and white offenders. A recent study by Walters (2014) found that education level and to a lesser extent, race and ethnicity moderate the relationship between criminal thinking and recidivism. Walters found that for those who had completed 12 or more years of school, criminal thinking was effective in predicting recidivism, whereas it was not for those with fewer than 12 years of education. A clear need exists to further explore how the strength of the association between criminal thinking and recidivism may vary depending on sample composition (Walters, 2011; 2014). This raises the question, is the relationship between criminal thinking and offending stronger for certain types of individuals than it is for others? Is criminal thinking less important – or even irrelevant – in predicting re-offense among some types of offenders? The answers to these questions have important practical implications.

The current study is based on the assumption that not all crimes are committed due directly to criminal thinking (e.g., negative attitudes towards authority, a sense of entitlement). Prior research suggests that among individuals with severe substance use disorders (i.e., addicts), a great deal of crime is fundamentally driven by substance dependence/addiction – the physical and psychological need for the illicit substance in question (Goldstein, 1985; Nurco, Shaffer, Ball, & Kinlock, 1984; Nurco, Hanlon, Kinlock, & Duszynski, 1988; Vaughn, 2011; White & Gorman, 2000). Dependence-driven crime can include the possession of illegal substances, as well as any crime committed to obtain resources necessary to obtain drugs. Consistent with this literature, the current study hypothesizes that among individuals with more severe substance use disorders, the need for the substances is the fundamental motivation for most criminal activity. Among non-dependent individuals, alternative motivating factors may take precedence. Other factors such as the cognitive distortions involved in criminal thinking² are more apt to be predictive of criminal activity among individuals with less severe substance use disorders. Teasing out the role that substance use disorders and criminal thinking play in predicting recidivism among offenders is important to advance the development of risk reduction interventions.

The Current Study

The current study extends the existing criminal thinking literature by testing the main and interactive effects of criminal thinking and substance use disorder (SUD) symptom severity on recidivism in two samples of justice-involved individuals. The study findings have implications for both theory and practice. Given the limited availability of treatment

¹Throughout this manuscript, the terms criminal thinking and criminal cognitions are used interchangeably to refer to a single construct. Although there are differences between thoughts and cognitions, the extant literature in the field of criminology has generally used these two terms to refer to the same underlying construct.

²No doubt, substance abuse and dependence is associated an array of cognitive distortions, but these are problematic distortions of a different type (e.g., biases in amount of use, impact on one's own level of functioning, likelihood of successfully engaging in moderate use), quite distinct from criminogenic patterns of thinking.

resources in correctional settings, targeting treatment services to offender needs and providing rehabilitative services that are capable of addressing multiple criminogenic needs is essential (Taxman, Caudy, & Pattavina, 2013). Many offenders, however, have a complex array of behavioral health treatment needs and there is a lack of convincing research informing which specific needs should be targeted, for what types of offenders to maximize reductions in recidivism. Although the risk-need-responsivity (RNR) framework (Andrews et al., 1990; Andrews & Bonta, 2010) identifies eight dynamic need factors related to recidivism, the framework provides less guidance on how to address the potentially complex interactions between these dynamic needs during programming.

To foster theoretical elaboration and inform the development and testing of rehabilitative interventions, the current study attempts to answer the question, does substance use disorder severity moderate the relationship between criminal thinking and future criminal behavior? It is hypothesized that the severity of individuals' SUD symptoms will significantly moderate the relationship between criminal thinking and recidivism. Specifically, it is predicted that the strength of the association between criminal thinking and recidivism will be attenuated for individuals who report higher levels of recent SUD symptoms relative to individuals who report lower levels of SUD symptoms or no SUD symptoms. For individuals with lower levels of SUD symptoms, it is hypothesized that criminal thinking will be a moderately strong predictor of recidivism. For individuals with more severe SUD symptoms, it is hypothesized that criminal thinking will not be significantly related to recidivism.

Two independent criminal justice samples and two existing measures of criminal thinking were used to test these hypotheses. Different levels of criminal justice risk, substance involvement, and penetration into the justice system characterized the two study samples. This provided the opportunity to investigate the extent to which sample composition may condition study findings. It also allowed for replication to test the robustness of findings across samples and different measures of criminal thinking. Study 1 utilized a sample of drug-involved probationers who participated in a randomized clinical trial (RCT) that tested the efficacy of a seamless model of substance abuse treatment during probation. Data on substance use and offending behavior were tracked over a 12-month follow-up period using both self-report and official measures. Study 2 utilized a sample of general population (felony) jail inmates assessed during incarceration and followed for 12 months post-release.

Data and Measures

Study 1 Participants

Participants were 226 drug-involved probationers who participated in a randomized clinical trial of a correctional intervention (see Table 1 for descriptive statistics). The RCT tested the efficacy of a seamless model of substance abuse treatment for probationers. The treatment group received substance abuse counseling during their regular visits to the probation office while the control group received referrals to community-based substance abuse counseling only. Study recruitment began in March of 2007 through referrals by probation officers at three sites in Maryland. To be eligible, individuals had to be on probation and required to complete a substance abuse treatment program as a condition of their sentence. Participants

were excluded from the study if they were on parole or a specialized caseload (e.g., sexual offenders, violent offenders). Those who lacked the capacity to provide consent were also ineligible. All participants were assessed at baseline and re-assessed at 12 months post-randomization. The baseline assessment generally occurred early in the probation sentence, but some participants had been on supervision for up to a year before enrolling in the study. Participants received honoraria of \$40 for each completed interview. All study procedures were approved by the George Mason University Institutional Review Board.

The Consolidated Statement on Reporting Trials (CONSORT) diagram for Study 1 is presented in Figure 1. A total of 415 probationers were assessed for eligibility; 164 of these clients did not participate in the study because (1) they did not meet the inclusion criteria ($n = 110$), (2) they declined to participate ($n = 10$), or (3) other reasons ($n = 44$). As such, 251 participants were randomized into the treatment ($n = 127$) and control ($n = 124$) groups. High follow-up rates were maintained at the 12-month follow-up assessment. Of the 251 participants, recidivism data was available for 226 (90%). Missing recidivism data was due to lack of administrative records for a small portion of the sample ($n = 25$). The final sample for analysis included 226 participants who had baseline and 12-month follow-up data.

Baseline Measures

Demographics—Participants self-reported their gender, age, race, years of education, and pre-probation employment status and income.

Criminogenic Cognitions—The Texas Christian University Criminal Thinking Scale (CTS), a 37-item instrument, was administered to measure criminal thinking in six areas: Entitlement, Justification, Power Orientation, Cold Heartedness, Criminal Rationalization, and Personal Irresponsibility (Knight et al., 2006). Items were scored on a 5-point Likert-type scale, ranging from 1 = *disagree strongly* to 5 = *agree strongly*. A total criminal thinking score was computed by averaging the scores on the six CTS composite measures (see Table 2 for descriptive statistics). Higher scores indicate the presence of higher levels of criminal thinking (Schwartz, Fremouw, Schenk, & Ragatz, 2012). Acceptable reliability (Cronbach's $\alpha = .63$) was found in the current sample, and the CTS previously demonstrated test-retest reliability in justice-involved samples (Knight et al., 2006).

Severity of Substance Use Disorder Symptoms—The Texas Christian University Drug Screen II (TCUDS II) was used to assess severity of SUD at baseline. This instrument contains nine binary questions concerning symptoms of substance use disorders (SUDs), with “yes” responses that are tallied to determine the total TCUDS score. The TCUDS scale ranges from 0 to 9, where a value of three or greater corresponds to a DSM-IV-TR (APA, 2000) drug dependence diagnosis. The TCUDS was used to compute a single SUD symptom severity score (see Table 2 for descriptive statistics). This instrument has been shown to be valid for identifying drug-involved offenders most likely to benefit from limited treatment resources and reliable for measuring SUD severity among correctional populations (Knight, Simpson, & Hiller, 2002).

One-year Follow-up Measures

Recidivism—Recidivism during the one-year follow-up period was assessed using self-report and official records. Participants self-reported arrests and crimes they had committed but not been caught for (undetected offenses). They were provided with a list of 25 offenses (e.g., robbery/attempted robbery/mugging, shoplifting/larceny/embezzlement, weapons offenses) and asked to self-report involvement in or arrest for each specific offense. Official records of arrests were also obtained from the State of Maryland's Criminal Justice Information System (CJIS). Drug use crimes were omitted from the recidivism variable because they may be largely due to substance dependence.³ Using these indicators, a dichotomous recidivism variable was created (0 = *did not recidivate* and 1 = *recidivated*). Recidivists were any participants who self-reported offending, self-reported a new arrest, or had a new official arrest in the State of Maryland during the 12-month follow-up period. A total of 46.0% of participants recidivated during the 12-month study period. Additional recidivism variables were created for each type of measure; official arrest, self-reported arrest, and self-reported undetected offending. Excluding drug offenses, 19.2% of the sample was flagged for an official arrest, 19.5% of the sample self-reported an arrest, and 27.0% of the sample self-reported an undetected offense.

Study 2 Participants

Participants were 337 pre-and post-trial inmates held on felony charges in a county jail located in a suburb of Washington DC (see Table 1 for descriptive statistics). Participants were recruited for baseline assessment between 2002 and 2007 - shortly after being assigned to the jail's general population (Time 1). Participants were re-interviewed approximately one year following release (Time 2). Participants received honoraria of \$15-18 at baseline (Time 1) and \$50 at the one-year follow-up (Time 2). All study procedures were approved by the George Mason University Institutional Review Board.

Of the 628 inmates who consented and were enrolled in the study (74.0% of those who were approached), 508 completed full, valid baseline assessment (e.g., were not transferred or released to bond before the assessments could be completed) and were followed longitudinally. A CONSORT diagram for this sample can be seen in Figure 2. Of the 508 inmates enrolled in the longitudinal study, 484 had valid data for the Time 1 criminal thinking variable, and 478 were eligible to be included in the Time 2 (one-year-post-release) recidivism data collection at the time of data analysis. Of the eligible 478 participants, 8 were detained by INS/deported and 2 were deceased or seriously disabled and therefore could not be interviewed. Of the remaining 478 participants, 337 (70.5%) had valid one-year post-release recidivism data as well as measures of criminal thinking and substance abuse. As such, the final sample for analysis included 337 participants.⁴

³All drug crimes were removed from the recidivism outcome, including manufacturing and distribution, due to an inability to distinguish between different types of drug crimes based on the information collected. Few crimes were due to drug trafficking or manufacturing.

⁴This retention rate compares favorably with other longitudinal studies of inmates (Brown, Amand & Zamble, 2009; Howerton, Burnett, Byng & Campbell, 1999; Inciardi, Martin & Butzin, 2004).

Baseline Measures

Demographics—Participants self-reported their gender, age, race, years of education, and pre-incarceration employment status and income.

Criminogenic Cognitions—The Criminogenic Cognitions Scale (CCS; Tangney, Meyer, Furukawa, & Cosby, 2002) is a 25-item self-report measure that taps five dimensions of criminal thinking: (a) Notions of Entitlement; (b) Failure to Accept Responsibility; (c) Short-Term Orientation; (d) Insensitivity to the Impact of Crime; and (e) Negative Attitudes Toward Authority. Items were rated on a 4-point scale with 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*, and averaged to create a total criminogenic cognitions score (see Table 2 for descriptive statistics). Evidence for the reliability and validity of the CCS has been demonstrated with jail inmates (Tangney et al., 2012); the CCS was reliable in the current sample (Cronbach's $\alpha = .72$).

Severity of Substance Use Disorder Symptoms—The Texas Christian University: Correctional Residential Treatment Form, Initial Assessment (TCU-CRTF; Simpson & Knight, 1998) was used to assess symptoms of substance use disorders on alcohol, marijuana, cocaine, and opiates during the year prior to incarceration. The TCU-CRTF has been used reliably with jail inmates (Stuewig, Tangney, Mashek, Forkner, & Dearing, 2009). Items assess each of the DSM-IV-TR (APA, 2000) substance dependence domains (e.g., for the domain of tolerance participants answered the question “How often did you find that your usual number of drinks had much less effect on you or that you had to drink more in order to get the effect you wanted?”) and responses range from 0 = *never* to 4 = *7 or more times*. For domains with multiple items, responses were averaged and a total score was computed by taking the mean across the domains. A maximum substance use disorder severity variable was created by taking each individual's highest level of symptoms on any of the assessed substances (see Table 2 for descriptive statistics). The TCU-CRTF differs from the TCUDS used in Study 1 because it utilizes several drug-specific scores rather than a single addiction severity score.

One-year Post-Release Follow-up Measures

Recidivism—As in Study 1, recidivism was assessed during the first year post-release using both self-report and official records. Participants reported whether they had been arrested for any of 16 different types of crime (e.g., theft, assault, sex offenses, fraud) and whether they had committed (undetected) any of the 16 different types of crime. Official National Crime Information Center (NCIC) criminal records of arrests in the first year post-release were also collected. Drug use crimes (as well as possession and distribution, because these were not able to be separated) were omitted from the recidivism variable because they may be largely due to substance dependence. Using these indicators, a dichotomous recidivism variable was created (0 = *did not recidivate* and 1 = *recidivated*). Participants who had an offense using any of the three indicators were considered recidivists. In the current sample, 62.3% of participants recidivated during the first year post-release. Additional recidivism indicators were created reflecting each type of measure available in the data. Excluding drug offenses, 38.7% of the sample was flagged for an official arrest, 37.2% self-reported an arrest, and 41.8% self-reported an undetected offense.

Analytic Procedure

To test the hypothesized moderation, logistic regression analyses were conducted in both samples to predict recidivism. The main and interactive effects of criminal thinking and substance dependence were examined. Both the criminal thinking and substance dependence variables were centered before the interaction term was calculated. No evidence of multicollinearity was found that would preclude conducting these analyses (see Table 2). Logistic regression analyses were conducted using SPSS statistical software.⁵ To interpret interactions, visual plots were created using the procedures of Aiken and West (1991) and Dawson (2014). After regressing the aggregated recidivism measure (excluding drug offenses) onto the independent variables, the analyses were repeated utilizing each specific indicator of recidivism available in the data. The purpose of this final step was to determine how robust the study findings were across multiple measures of recidivism. This analytic procedure was replicated across both sources of data. The results from each study are reported separately and then are considered together in the discussion section.

Results

Study 1: Drug-Involved Probationers

Bivariate relations and descriptive statistics are displayed in Table 2. At the multivariate level, neither criminal thinking ($B = .61, p = 0.43$) nor substance use disorder severity ($B = .09; p = 0.07$) were significantly related to recidivism (Table 3). The interaction between criminal thinking and SUD severity was also not significant ($B = -.03, p = 0.78$), suggesting the relationship of criminal thinking and recidivism did not vary depending on the level of SUD severity in the Study 1 sample of substance-involved probationers. After running the initial multivariate model, the model was re-estimated controlling for study condition (treatment versus control). Controlling for study condition did not change the overall pattern of results. The analyses were repeated using a dichotomous recidivism outcome that included drug offenses. The pattern of results and lack of significant findings were consistent with the model reported in Table 3. Finally, the analyses were repeated utilizing separate indicators of official arrest, self-reported arrest, and self-reported offending (Table 4). The findings generally remained consistent with the exception of a significant relationship observed between substance use disorder severity ($B = .13, p < 0.05$) and self-reported offending.

Taken together, Study 1 findings indicate that neither criminal thinking, as measured using the CTS total score, nor SUD severity are related to aggregate recidivism in the study sample of drug-involved probationers. Additionally, SUD severity does not moderate the relationship between criminal thinking and recidivism in the study sample. SUD severity did however significantly predict self-reported offending. Although the interaction between criminal thinking and SUD severity was not significant in any of the Study 1 models, the direction of the effect was consistent with the study hypothesis that the relationship between criminal thinking and recidivism is more robust for individuals with less severe SUD

⁵Results were replicated using MPlus statistical software in order to use Full Information Maximum Likelihood (FIML) and utilize the full available sample. The pattern of results remained the same in both studies using this method of analysis.

symptoms. One possible explanation for the lack of a significant interaction is that the characteristics of the current sample (e.g., high prevalence rate of SUDs) may have limited our ability to detect a main effect of SUD severity and an interaction between SUD severity and criminal thinking. Therefore we next examined parallel analyses in Study 2 using a sample of general population jail inmates. The Study 2 sample was more heterogeneous with respect to pre-criminal justice system involvement SUD severity.

Study 2: General Population Jail Inmates

Bivariate relations and descriptive statistics are displayed in Table 2. At the multivariate level, criminal thinking ($B = .78, p < .05$) and substance dependence ($B = .26, p < .01$) were both uniquely and positively related to recidivism during the first year post-release (Table 3). A significant interaction was also found ($B = -.58, p < .05$), whereby, as predicted, the relation between criminal thinking and recidivism was attenuated for individuals with higher levels of SUD symptoms (Figure 3). To further illustrate the point, among inmates reporting fewer than three symptoms of substance dependence, the correlation between criminal thinking and recidivism was $r(236) = .25, p < .001$. Among those reporting three or more symptoms of substance dependence, the correlation was $r(101) = -.06, p = .54$.⁶

Replicating the process used in Study 1, analyses were repeated utilizing a dichotomous indicator of recidivism that included drug offenses. Again, the direction, magnitude, and significance of the effects remained consistent. Criminal thinking ($B = 1.04, p < .01$) and substance dependence ($B = .25, p < .01$) were both uniquely and positively related to recidivism and a significant interaction between the two variables was observed ($B = -.55, p < .05$).

After estimating the logistic regression models utilizing the aggregate recidivism measure, models were replicated using separate dichotomous indicators of official arrests, self-reported arrests, and self-reported offending (Table 4). The findings presented in Table 4 indicate that only SUD severity ($B = .24, p < .01$) significantly predicted a new official arrest in the jail-based sample. Criminal thinking and the criminal thinking by SUD severity interaction did not significantly predict a new official arrest. The negative coefficient observed for the criminal thinking by SUD interaction was consistent with the findings from the aggregate model; however, this effect was not significant. In the model predicting self-reported arrest, both criminal thinking and SUD severity were significant predictors of recidivism. Additionally, the interaction between criminal thinking and SUD severity was negative and statistically significant ($B = -.55, p < .05$). Finally, in the model predicting a new self-reported offense within one year of initial interview, both criminal thinking and SUD severity positively and significantly predicted recidivism. The interaction effect was not significant in the self-reported offense model and the direction of the effect was inconsistent with the study hypothesis.

Results from the aggregate recidivism model in Study 2 are consistent with the study hypothesis that higher levels of substance use disorder severity attenuate the relationship between criminal thinking and recidivism. As such, results indicate that criminal thinking

⁶The DSM-IV-TR (APA, 2000), upon which the TCU-CRTF was based, requires an individual to have three symptoms of substance dependence in order to receive a diagnosis of substance dependence.

may be less important in predicting recidivism (especially official and self-reported arrest) during the first year following release from incarceration among individuals with higher levels of SUDs. Further analysis suggests the nature of the relationship between criminal thinking, SUD severity, and recidivism varies depending upon the type of recidivism measure used.

Discussion

The primary aim of the current study was to test whether substance use disorder symptoms moderate the relationship between criminal thinking and recidivism to more fully understand the intricate interplay between criminogenic needs and better inform correctional treatment practices. A small but growing body of literature explores the potential moderating effects of either offender characteristics (e.g., age, gender, race) or other dynamic risk factors on the relationship between criminal thinking and recidivism. In this study we focused on substance use disorders because of their prevalence among the offender population. Findings from the general population jail sample suggest that both substance dependence and criminal thinking have a unique and independent effect on recidivism. Further analyses of the jail-based sample also suggest that among individuals who suffer from a greater number of SUD symptoms, criminal thinking/cognitions may not be the primary driver of recidivism. This finding represents support for the study hypothesis that the strength of the association between criminal thinking and recidivism is attenuated when individuals also suffer from severe substance use disorders. The study findings indicated a significant, moderately strong association between criminal thinking and recidivism for individuals who endorsed fewer than three SUD symptoms but no significant association for individuals with three or more symptoms.

The consistency of the finding observed in the Study 2 aggregated recidivism model varied across models utilizing different operational definitions of recidivism. In Study 2, a significant moderation effect was observed only in the model that predicted self-reported arrest. A similar pattern of results was observed in the Study 2 model predicting a new official arrest within one year post-incarceration; however, this effect was not significant. Across both study samples, the direction of the moderation effect was consistent with the primary study hypothesis in five of the six disaggregated recidivism models (Table 4). While the magnitude of the observed effects was small, the findings do suggest that substance use disorder symptoms may attenuate the strength of the relationship between criminal thinking and recidivism; especially when recidivism is measured as a self-reported or official arrest. Replicating study procedures with larger samples of criminal justice clients is recommended.

The absence of significant results in Study 1 is in one sense consistent with the notion that SUD severity attenuates the impact of criminal thinking. The Study 1 sample was more homogenous in terms of SUD status. All participants were drug-involved probationers who varied in severity, not presence/absence, of significant substance misuse. This is a unique sample of drug-involved offenders who are relatively older (average age is 37) and who have limited financial resources and considerable prior justice involvement (see Table 1). In this sample, SUD symptoms did not significantly moderate the relationship between

criminal thinking and recidivism. In fact, there were no main effects for either criminal thinking or severity of SUD symptoms in predicting recidivism, which may be due to the sample being comprised completely of substance abusers. The lack of a significant main effect of criminal thinking in this sample is consistent with the overall study hypothesis. To the extent that substance dependence attenuates the importance of criminal thinking, one would expect minimal predictive effects in a sample of exclusively drug-involved individuals. The lack of an interaction effect (and the lack of a main effect of symptom severity) in Study 1 suggests that it is not severity of symptoms, but presence versus absence of problematic drug use that attenuates the predictive utility of criminal thinking/cognitions.

The use of two qualitatively distinct samples allowed us to consider the extent to which sample composition alters the relationship between criminal thinking, SUD symptom severity, and recidivism. Given the disparate findings in the literature depending upon the sample in question, this allowed for a more rigorous test of our hypotheses. This also provided the opportunity to replicate the study findings in multiple samples to potentially enhance generalizability. We did, however, utilize two different measures of criminal thinking and SUD symptom severity. This may account for the differential findings and calls for future research using parallel measures in unique offender samples. Further empirical investigation is needed to determine whether the study sample and/or the instruments employed influence the pattern of results. For example, a recent study by Walters (2012b) found that reactive, but not proactive criminal thinking correlated significantly with prior substance use. This suggests that the type of measure used to operationalize criminal thinking/cognitions may impact whether or not an effect is detected and how findings should be interpreted.

Consistent with recent meta-analytic evidence reported by Walters (2012a), Study 2 found support for the predictive validity of criminal thinking as a risk factor for recidivism in a sample of general population jail inmates. As in prior studies, the strength of the association between criminal thinking and recidivism was relatively weak given its prominence in recent correctional discourse (Walters, 2011). The lack of robustness of the association between criminal thinking and recidivism in the literature has led to some recent exploration of moderators of this relationship. This is a promising avenue of inquiry. Studies examining moderators of the relationship between criminal thinking and recidivism can help clarify the generalizability of the relationship, which may be useful in targeting criminal thinking treatment toward populations for whom it is more likely to be effective.

The finding that SUD symptom severity moderated the relationship between criminal thinking and recidivism in the sample of offenders (jail) has implications for practice. The presence of various factors that may moderate this relationship can inform differential treatment intervention frameworks. For example, the current study findings suggest preliminarily that interventions aimed at reducing recidivism risk by addressing criminal thinking should be prioritized for individuals without severe SUDs. For substance dependent individuals, treatment for the SUD should be of highest priority. However, one empirical analysis of the impact of criminal thinking styles on substance abuse treatment engagement found that higher levels of criminal thinking were significantly associated with lower levels of treatment engagement and worse client functioning (Best, Day, Campbell, Flynn, &

Simpson, 2009). This suggests a possible need to provide motivational enhancement interventions for individuals with higher levels of criminal thinking before beginning intensive substance abuse treatment. This presents an interesting challenge for the field of correctional interventions. While the “best practice” literature has recently called for more integrated intervention frameworks that can effectively address multiple problem behaviors for offenders (Polaschek, 2011), few such frameworks have been developed and subjected to rigorous evaluation. The assumption appears to be that we have more to gain (or less to lose) from providing multi-target interventions than from effectively targeting specific criminogenic factors. This raises questions about how to best provide correctional programming that can mitigate risk and improve overall client well-being in an era of severely limited clinical and financial resources.

Our findings underscore the need for continued research comparing the efficacy of single-target versus general behavioral change interventions, taking into account offender-level characteristics, as well as research on the potential moderating effects of other criminogenic needs. Given the complexity of individual offender needs (Taxman & Caudy, forthcoming), this research could be particularly useful for informing either the development of integrated correctional interventions or need-specific placement matching and case planning strategies.

The current research has several limitations that are important to consider. Most notably, Study 1 and Study 2 relied on different measures of criminal thinking and substance use disorders. It is possible that the main effect of criminal thinking and its interaction with substance dependence was observed not because of the greater heterogeneity in substance misuse in Study 2, but rather because the CCS is a more sensitive measure of criminal cognitions than the CTS. Further psychometric work is needed for both measures, ideally comparing their utility in samples heterogeneous with respect to substance dependence. In addition, future research might attempt to replicate the current findings using the Psychological Inventory of Criminal Thinking Styles (PICTS) or other measures of criminal thinking to determine whether the pattern of results is parallel across diverse measures. Another limitation that warrants consideration is the small sample sizes utilized in the current study. While the Study 1 sample was drawn from an RCT of a correctional intervention and was fairly homogeneous on a number of relevant variables, the Study 2 sample was more heterogeneous and more generalizable to the overall offender population. Still, replication of the current study findings in larger samples across other justice and treatment settings will be important for establishing the robustness of the observed relationships. The decision to use an aggregate measure of criminal thinking as opposed to measures of specific criminal thinking styles may also limit the applications of the current study findings. Additional research is needed to establish which specific criminal thinking styles may or may not be moderated by substance use disorders.

Research that examines mediators and moderators of predictive validity and treatment effectiveness is an essential component of establishing what works for whom in regards to correctional interventions. This is particularly important given the limited correctional and treatment resources available. Given the recent prominence of criminal thinking/cognitions in the field of corrections, continued research is needed to fully understand the complex nature of this construct and how its salience as a risk reduction target may vary across

offender subgroups. The current study findings, along with recent research by Walters (2014), suggest that criminal thinking is differentially salient across subgroups. The implications of these findings for program effectiveness should be directly tested to ensure that correctional treatment resources are not misapplied.

References

- Aiken, L.S.; West, S.G. *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park; London: Sage: 1991.
- Andrews, D.A.; Bonta, J. *The psychology of criminal conduct*. 5th. New Providence; NJ: Anderson: 2010.
- Andrews D.A., Bonta J., Hoge R.D. Classification for effective rehabilitation: Rediscovering psychology. *Criminal Justice and Behavior*. 1990; 17(1):19–52.
- Brown S.L., St. Amand M.D., Zamble E. The dynamic prediction of criminal recidivism: A three-wave prospective study. *Law and Human Behavior*. 2009; 33:25–45. [PubMed: 18629620]
- Dawson J.F. Moderation in management research: What, why, when and how. *Journal of Business and Psychology*. 2014; 29:1–19.
- Enders C.K., Bandalos D.L. The relative performance of Full Information Maximum Likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*. 2001; 8(3): 430–457.
- Goldstein P.J. The drugs/violence nexus: A tripartite conceptual framework. *Journal of Drug Issues*. 1985; 39:143–174.
- Hollin C.R., Palmer E.J. Cognitive skills programmes for offenders. *Psychology, Crime & Law*. 2009; 15:147–164.
- Howerton A., Burnett R., Byng R., Campbell J. The consolations of going back to prison: What “Revolving Door” prisoners think of their prospects. *Journal of Offender Rehabilitation*. 1999; 48:439–461.
- Inciardi J.A., Martin S.S., Butzin C.A. Five-year outcomes of therapeutic community treatment of drug-involved offenders after release from prison. *Crime & Delinquency*. 2004; 50:88–107.
- Knight K., Garner B.R., Simpson D.D., Morey J.T., Flynn P.M. An assessment for criminal thinking. *Crime & Delinquency*. 2006; 52(1):159–177.
- Knight, K.; Simpson, D.D.; Hiller, M.L. Screening and referral for substance-abuse treatment in the criminal justice system. In: Leukefeld, C.G.; Tims, F.M.; Farabee, D., editors. *Treatment of drug offenders: Policies and issues*. Springer; New York, NY: 2002. p. 259–272.
- Lipsey M.W., Landenberger N.A., Wilson S.J. Effects of cognitive-behavioral programs for criminal offenders. *Campbell Systematic Reviews*. 2007 Retrieved from <http://campbellcollaboration.org/lib/project/29/>.
- Mandracchia J.T., Morgan R.D. Predicting offenders’ criminogenic conditions with status variables. *Criminal Justice and Behavior*. 2012; 39(1):5–25.
- Mills J.F., Kroner D.G. The Criminal Sentiments Scale: Predictive validity in a sample of violent and sex offenders. *Journal of Clinical Psychology*. 1997:399–404. [PubMed: 9169395]
- Nurco D.N., Hanlon T.E., Kinlock T.W., Duszynski K.R. Differential criminal patterns of narcotic addicts over an addiction career. *Criminology*. 1988; 26:407–423.
- Nurco D.N., Shaffer J.C., Ball J.C., Kinlock T.W. Trends in the commission of crime among narcotic addicts over successive periods of addiction. *American Journal of Drug and Alcohol Abuse*. 1984; 10:481–489. [PubMed: 6534180]
- Polaschek D.L. Many sizes fit all: A preliminary framework for conceptualizing the development and provision of cognitive-behavioral rehabilitation programs for offenders. *Aggression and Violent Behavior*. 2011:20–35.
- Simourd D.J., Van De Ven J. Assessment of criminal attitudes: Criterion-related validity of the Criminal Sentiments Scale-Modified and Pride in Delinquency Scale. *Criminal Justice and Behavior*. 1999; 26(1):90–106.

- Simpson, DD.; Knight, K. TCU data collection forms for correctional residential treatment. Texas Christian University, Institute of Behavioral Research; Fort Worth, Texas: 1998.
- Stuewig J, Tangney JP, Mashek D, Forkner P, Dearing RL. The moral emotions, alcohol dependence, and HIV risk behavior in an incarcerated sample. *Substance Use and Misuse*. 2009; 44:449–471. [PubMed: 19242862]
- Tangney, JP.; Meyer, P.; Furukawa, E.; Cosby, B. The Criminogenic Cognitions Scale. George Mason University; Fairfax, VA: 2002.
- Tangney JP, Stuewig J, Furukawa E, Kopelovich S, Meyer P, Cosby B. Reliability, validity, and predictive utility of the 25-item Criminogenic Cognitions Scale (CCS). *Criminal Justice and Behavior*. 2012; 39(10):1340–1360. [PubMed: 24072946]
- Taxman FS, Caudy MS. Risk tells us who, but not what or how: An empirical assessment of the complexity of criminogenic needs to inform correctional programming. *Criminology & Public Policy*. forthcoming. forthcoming.
- Taxman, FS.; Caudy, MS.; Pattavina, A. Risk-Need-Responsivity (RNR): Leading towards another generation of the model. In: Taxman, FS.; Pattavina, A., editors. *Simulation strategies to reduce recidivism: Risk Need Responsivity (RNR) modeling in the criminal justice system*. Springer; New York, NY: 2013. p. 285-307.
- Taxman FS, Rhodes AG, Dumenci L. Construct and predictive validity of criminal thinking scales. *Criminal Justice and Behavior*. 2011; 38(2):174–187.
- Travers R, Mann RE, Hollin CR. Who benefits from cognitive skills programs? Differential impact by risk and offense type. *Criminal Justice and Behavior*. 2014; 41(9):1103–1129.
- Vaughn M. Addiction and criminal justice: Empirical findings and theory of advancing public safety and health. *Journal of Criminal Justice*. 2011; 39:205–206.
- Walters GD. Predicting recidivism with the Psychological Inventory of Criminal Thinking Styles and Level of Service Inventory-Revised: Screening Version. *Law and Human Behavior*. 2011; 35:211–220. [PubMed: 20464628]
- Walters GD. Criminal thinking and recidivism: Meta-analytic evidence on the predictive and incremental validity of the Psychological Inventory of Criminal Thinking Styles (PICTS). *Aggression and Violent Behavior*. 2012a; 17(3):272–278.
- Walters GD. Substance use and criminal thinking: Testing the countervailing, mediation, and specificity hypotheses. *Law and Human Behavior*. 2012b; 36:506–512. [PubMed: 22251242]
- Walters GD. Relationships among race, education, criminal thinking, and recidivism: Moderator and mediator effects. *Assessment*. 2014; 21(1):82–91. [PubMed: 22327209]
- White, HR.; Gorman, DM. Criminal justice 2000 volume 1. The nature of crime: continuity and change. U.S. Department of Justice; Washington, DC: 2000. Dynamics of the drug-crime relationship; p. 151-218.
- Wooditch A, Tang L, Taxman FS. Which criminogenic need changes are most important in promoting desistance from crime and substance use? *Criminal Justice and Behavior*. 2014; 41(3):276–299. [PubMed: 24910480]

Highlights

- Criminal thinking and substance use predicted recidivism in a jail sample
- Neither construct predicted recidivism in a drug-involved probation sample
- SUD severity moderated the association between criminal thinking and recidivism
- Findings varied across measures of recidivism
- Identifying moderators is important for establishing what works for whom

Figure 1.
CONSORT diagram for Study 1.

Figure 2.
CONSORT diagram for Study 2.

Figure 3.
Predicting recidivism from criminal thinking and substance use disorder severity in Study 2.

Table 1

Participant Demographic Characteristics

Characteristics	Study 1 (<i>n</i> = 226)		Study 2 (<i>n</i> = 337)	
	M (SD) / %	Range	M (SD) / %	Range
Age (years)	36.83 (11.54)	18-64	33.22 (10.16)	18-69
Sex (% Male)	73.5%		70.0%	
Race/Ethnicity				
African-American	68.1%		46.9%	
Caucasian	30.1%		35.3%	
Hispanic	0.4%		5.9%	
Other	1.3%		11.9%	
Marital Status				
Never Married	68.1%		55.4%	
Married	10.6%		15.2%	
Separated	7.1%		9.8%	
Divorced	12.8%		14.9%	
Widowed	1.3%		0.3%	
Other	-		4.4%	
Years of School	11.41 (1.61)	6-17	11.85 (2.21)	0-19
Annual Income	8,391.10 ^a (10,647.69)	0-48,000	20,767.94 (23,838.13)	0-116,000
Employment Status				
Unemployed	43.4%		13.0%	
Employed	56.6%		87.0%	

Note. All demographic characteristics were reported at baseline;

^a=Calculated based on self-reported income over the prior 30 days.

Table 2**Bivariate Relations and Descriptive Statistics**

	1	2	3	M	SD	Range
<u>Study 1 (n = 226)</u>						
<u>Baseline</u>						
1. Criminal Thinking	--	.00	.08	2.37	0.41	1.40-3.55
2. SUD Severity		--	.12 [†]	6.04	2.76	1-9
<u>One-year follow-up</u>						
3. Recidivism			--	.46	.50	0-1
<u>Study 2 (n = 337)</u>						
<u>Baseline</u>						
1. Criminal Thinking	--	.16**	.18**	2.23	0.35	1.28-3.28
2. SUD Severity		--	.22**	1.74	1.53	0-4
<u>One-year post-release</u>						
3. Recidivism			--	.62	.49	0-1

Note.

* $p < .05$;

** $p < .01$;

[†] $p < .10$

Table 3

Logistic Regression Predicting Recidivism (without drug offenses) from Criminal Thinking and Substance Dependence

	Study 1 (<i>n</i> = 226)		Study 2 (<i>n</i> = 337)	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
Criminal Thinking	0.41 (0.33)	1.50 (0.79-2.87)	0.78 (0.36)*	2.17 (1.08-4.40)
SUD Severity	0.09 (0.05)	1.10 (0.99-1.21)	0.26 (0.08)**	1.29 (1.10-1.52)
CT × SUD	−0.03 (0.12)	0.97 (0.76-1.22)	−0.58 (0.24)*	0.56 (0.35-0.89)
Constant	−0.17 (0.14)	0.84	0.58 (0.12)**	1.80

Note.

CT = Criminal thinking; SUD = Substance use disorder; Results presented represent simultaneous rather than step-wise regression – step-wise models were estimated and the pattern of results were consistent

*
 $p < .05$,

**
 $p < .01$;

Table 4

Logistic Regression Predicting Recidivism Type (without drug offenses) from Criminal Thinking and Substance Dependence

	Study 1 (n = 226)		Study 2 (n = 337)	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
<i>Official Arrest</i>				
Criminal Thinking	0.40 (0.47)	1.49 (0.59-3.75)	0.45 (0.34)	1.57 (0.80-3.07)
SUD Severity	0.02 (0.07)	1.02 (0.89-1.17)	0.24 (0.08)**	1.27 (1.09-1.47)
CT × SUD	-0.26 (0.17)	0.77 (0.55-1.08)	-0.37 (0.23)	0.69 (0.44-1.07)
Constant	-1.47 (0.19)**	0.23	-0.46 (0.12)**	0.63
<i>Self-Reported Arrest</i>				
Criminal Thinking	0.28 (0.41)	1.32 (0.59-2.97)	0.99 (0.36)**	2.69 (1.34-5.42)
SUD Severity	0.01 (0.06)	1.01 (0.90-1.15)	0.26 (0.08)**	1.29 (1.11-1.51)
CT × SUD	-0.17 (0.15)	0.85 (0.63-1.14)	-0.55 (0.23)*	0.58 (0.37-0.91)
Constant	-1.44 (0.17)**	0.24	-0.55 (0.12)**	0.58
<i>Self-Reported Offense</i>				
Criminal Thinking	0.28 (0.37)	1.32 (0.64-2.75)	0.86 (0.34)*	2.37 (1.21-4.63)
SUD Severity	0.13 (0.06)*	1.14 (1.02-1.28)	0.36 (0.08)**	1.44 (1.24-1.68)
CT × SUD	-0.03 (0.14)	0.98 (0.74-1.28)	0.02 (0.23)	1.02 (0.65-1.60)
Constant	-1.03 (0.16)**	0.36	-0.36 (0.12)**	0.70

Note.

CT = Criminal thinking; SUD = Substance use disorder; Results presented represent simultaneous rather than step-wise regression – step-wise models were estimated and the pattern of results were consistent

*
p < .05,

**
p < .01;