

Validating a Screening Instrument for Co-Occurring Disorders in a Sample of Jail Inmates

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Abstract

Research indicates that prisoner reentry is among the pressing issues facing the criminal justice system. Research also shows that successful reentry is greatly diminished by the presence of co-occurring substance abuse and mental health disorders (COD). Individuals with CODs have long criminal histories and may be under the influence of the disorders at the time of the crime. Effective screening of CODs is necessary for both institutional treatment and community-based services during reentry. This research tests the construct validity of the Comprehensive Addictions and Psychological Evaluation (CAAPE) instrument using a pre-test, post-test experimental design with 170 inmates from a county jail who participated in a reentry program. Multiple criminal history measures served as the dependent variables and analyses consisted of Poisson and logistic regression models. The results showed that the subscales of the CAAPE are valid screening tools for identifying CODs and that these disorders were significantly related to prior criminal history and recidivism after reentry.

Keywords: Substance abuse, Mental health disorders, Co-occurring disorders, Criminal behavior.

Introduction

One of the most significant problems facing the criminal justice system is the reentry of inmates back into the community. There is increasing research interest and policy concern with respect to reentry. The sheer size of the reentry population warrants such attention. In 2010, 708,677 inmates were released (Guerino, Harrison, & Sabol, 2010), and in 2011, 688,384 offenders, approximately 1,885 individuals per day, were released from custody (Carson & Sobel, 2012). Hughes and Wilson (2002) have indicated that at least 95% of state inmates will ultimately be released. When one includes the approximately nine million offenders released from jails annually (Beck, 2006), offender reentry involves a significant order of magnitude. Simply, policymakers, and the general public alike, now expect corrections to “do a better job” by developing evidenced-based practices to facilitate reentry and prevent recidivism.

Inmates face the usual deficits in areas like education, employment, vocational skills, etc., that affect propensity to commit crime, but successful reentry is further compromised by the substantial proportions of offenders who have substance abuse or mental health issues, and even worse, co-occurring disorders. There is growing evidence that these risk factors affect sizable proportions of offenders.

Substance Abuse

The National Center on Addiction and Substance Abuse (CASA) published two relevant studies. CASA reported that 80% of 1.7 million inmates were substance involved in 1996 (1998). In 2006, of 2.3 million inmates, 1.9 million were substance involved and 64.5% met the criteria for alcohol or other drug use disorders. Another 20% (458,000) did not meet DSM-IV criteria, but were nevertheless substance involved—under the influence of alcohol or other drugs at the time of their offense, stole money to buy drugs, are substance abusers, violated alcohol or drug laws, or a combination of these characteristics (CASA, 2010).

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CASA (2010) also indicated that the substance abuse problem cuts across venues: 84.8% of all inmates were substance involved, including 86.2% of federal, 84.6% of state, and 84.7% of jail inmates. Research has also shown that substance abuse was proximate to the commitment offense. Karberg and James (2005) found that one-half of all jail inmates were under the influence of drugs or alcohol. Similarly, Mumola and Karberg (2006) found that one-third of state and one-quarter of federal prisoners committed crimes under the influence of drugs. Begum, Early, and Hodge (2016) found that significant percentages of state and federal prisoners had committed crimes while under the influence of drugs. At the time of arrest, 63-83% tested positive (marijuana and cocaine being the most common). They also reported that, between 2000-2013, the percentage of arrestees with opiates in their system increased.

Mental Health

Research further shows that mental health deficits can affect reentry by posing increased risks of recidivism. In one Bureau of Justice Statistics (BJS) study, Ditton (1999) reported important findings. First, 16% of state, 7% of Federal, and 16% of jail inmates reported a mental condition or an overnight stay in a mental hospital. Second, state prison inmates with a mental condition differed from other inmates: (1) more likely to have a violent offense (53% versus 46%); (2) more likely to be under the influence of alcohol or drugs (59% versus 51%); and (3) more than twice as likely to have been homeless in the 12 months prior to arrest (20% versus 9%). Third, the mental illness and crime connection is longstanding—three-quarters had been sentenced to time in prison or jail or on probation at least once prior to the current sentence. In a second BJS study, James and Glaze (2006) found that half of all prison and jail inmates had a mental health problem, including 705,600 in state prisons, 78,800 in federal prisons, and 479,900 in local jails. These cases represented 56% of state prisoners, 45% of federal prisoners, and 64% of jail inmates. Steadman, Osher, Robbins, Case, and Samuels, (2009) reported that 16.9% of people admitted to jail have serious mental illnesses with rates three times higher for men and six times higher for women than the general population. Likewise, CASA (2010) reported a much higher percentage of mental illness—one-third (32.9%) of the 2.3 million prison and jail inmates.

Co-Occurring Disorders

The research on substance abuse and mental health disorders among offenders indicates that substance abusers also had a significant prevalence of mental illness and vice versa, thus suggesting the co-morbidity of these factors. If significant co-morbidity exists, there would be need for increased attention to these offenders while incarcerated and as factors also during reentry. In order to determine if the prevalence of co-occurring disorders among offenders exceeds that in the general population, the baseline must be established. SAMHSA has provided such data. The 2014 National Survey on Drug Use and Health (SAMHSA, 2015) indicated that an estimated 7.9 million adults aged 18 or older (3.3%) had both mental illness and substance use disorder in the past year, and an estimated 2.3 million had a serious mental illness and substance use disorder (1.0 %). According to SAMHSA, these prevalence data are virtually the same from 2008 through 2014.

Given the emerging importance of the topic of co-occurring disorders among offenders, one would expect that numerous studies would provide estimates of the extent of co-morbidity. To the contrary, the majority of studies merely indicate that co-morbidity is highly important and that the prevalence among offenders “far exceeds that of the general population,” but few estimates of the extent of co-morbidity are provided (Baillargeon, Binswanger, Penn, Williams, & Murray, 2009a; Osher, Steadman, & Barr, 2003; Osher, 2013, Peters, Bartoi, & Sherman, 2008; Peters, Wexler, & Lurigio, 2015). It is more problematic when published studies provide a so-called estimate of co-morbidity (percent of substance abuse among offenders with mental health disorders) but fail to provide the underlying percentage of the latter. For example, Peters, Bartoi, and Sherman observed that, “Studies indicate that 72–87% of justice-involved individuals with severe mental disorders have co-occurring substance use disorders” (2008: 2). The so-called 72-87% co-morbidity statistic is not at all helpful because we are not given the underlying percentage of the mental health disorders. If these mental disorder inmates constitute only 10 percent of justice-involved people, then co-morbidity represents only from 7.2-8.7%. If however, 40% of the justice-involved individuals have diagnosed mental health disorders, then co-morbidity affects from 28.8-34.8%.

Simply, much prior research has failed to provide meaningful data concerning co-morbidity prevalence (Abram & Teplin, 1991; Abram, Teplin, & McClelland, 2003; Chiles, Cleve, Jemelka, & Trupin, 1990). Fortunately, there are a few studies that provide estimates of co-morbidity. Cote and Hodgins (1990) investigated co-occurring disorders among 650 inmates in Quebec, Canada.

The sample constituted 21.9 percent of the male penitentiary population in April 1988. Disorders were based on results from DSM-III criteria. A variety of statistical results are reported for co-morbidity based on mental illness disorders and then drug abuse concurrence, or drug abuse diagnosis and then the co-occurrence of various mental health disorders. For our purposes, we will focus on the latter. Among inmates with a substance abuse diagnosis, the co-morbidity results for mental disorders were: (1) schizophrenic, 10.8%; (2) bipolar, 5.4%; (3) atypical bipolar, 5.4%; (4) major depression, 17.4%; (5) antisocial personality, 74.7%; and (5) alcohol abuse, 74.7%. For each co-morbidity category, the prevalence is far greater than in the general population.

James and Glaze (2006) analyzed the data from two BJS surveys: (1) *Inmates in State and Federal Correctional Facilities, 2004*; and (2) *Inmates in Local Jails, 2002*. BJS has conducted the surveys every 5-6 years since 1972, and are the only national source of detailed information on criminal offenders, particularly special populations such as drug and alcohol users and offenders who have mental health problems (James & Glaze, 2006:11). They compared drug-involved inmates with and without mental health issues and found that mental disorders affected 56.2% of state inmates, 44.8% of federal inmates, and 64.2% of jail prisoners. They also found that impaired inmates had abused drugs, 18% state, 16.1% federal, and 17.3% jails. When we combine these percentages to reflect co-morbidity, we see that mental health disorders occur with substance abuse issues for 10% of all state inmates, 7% of all federal inmates, and 11% of all prisoners in local jails. These data are far in excess of the general population.

Blandford and Osher (2013) have provided recent co-morbidity data. They have estimated mental illness and drug abuse co-morbidity from a variety of sources. Their estimated prevalence of serious mental disorders are as follows: 5.4% for the general public, 16% for state prisons, 17% for jails, and 7–9% for probation and parole. The prevalence of substance abuse across and a serious mental health condition are as follows: 25% for the general public, 59% for state prisons, 72% for jails, and 49% for probation and parole cases. The correct co-morbidity prevalence is determined by multiplying the two percentages across the four categories. Thus, the estimated co-morbidity of a serious mental illness combined with substance abuse is: 1.4% for the general public, 9.4% for state prisons, 12.2% for jails, and 3.9% percent for probation and parole cases. Confidence in these estimates is enhanced because the general public co-morbidity figure of 1.4 percent is very close to the 1.0 percent reported in the SAMHSA (2015) study. The Blandford and Osher study showed that compared to the general public, co-morbidity was 6.7 times higher among state prisoners, 8.7 times higher for jail prisoners, and 2.8 times higher for people on probation or parole.

In summary, prior research on criminogenic risk factors has established the following. First, substantial proportions of offenders have diagnosed substance abuse issues. Further, many criminals used drugs proximal to the time of their offenses, or were under the influence of drugs at the time they were arrested. Second, prisoners show a much greater percentage of mental conditions than does the general public. Third, the co-morbidity of substance abuse and mental health disorders far exceeds that in the general public. These co-occurring disorders may have influenced the onset of criminality, and more important, pose serious risks for continued criminality when they are returned to society. A recent special issue of *Psychiatric Rehabilitation Journal* confirms that co-occurring disorders has reached the forefront of research (see Peters, Wexler, & Lurigio, 2015; Hunt, Peters, & Kremling, 2015; Ogloff, Talevski, Lemphers, Wood, & Simmons, 2015; Houser & Belenko, (2015).

Screening

Given the strength of the relationship between co-occurring disorders and crime, it is obvious that effective screening should be a routine practice in correctional settings. There are numerous screening instruments available (Peters, Bartoi, & Sherman, 2008; Braude and Miller, 2011). However, there are numerous barriers to effective screening and assessment of co-occurring disorders. In a comprehensive monograph on screening and assessment, Peters, Bartoi, & Sherman, (2008) have identified major barriers to effective screening. The first barrier concerns the screening process itself. There may be a failure to examine one or more components of the co-occurring disorders. Sometimes this is due to ineffective screening instruments, or inadequate staff training or, because there is a bifurcated mental health and substance abuse service systems that feature separate screening and assessment processes (Peters, Bartoi, & Sherman, 2008). A second factor concerns the difficulty in determining whether psychiatric symptoms are caused by recent substance abuse or reflect the presence of a mental disorder (Peters, Bartoi, & Sherman, 2008: v). Regardless of the basis for ineffective screening, there is a pervasive failure to screen for co-occurring disorders in the justice system (Chandler, Peters, Field, & Juliano-Bult, 2004).

A major consequence of this failure is that offenders with co-occurring disorders are not accorded treatment or they are placed in inappropriate treatment (e.g., in less intensive services than are needed), resulting in high rates of criminal recidivism following release (Peters, Bartoi, & Sherman, 2008). Peters, et al., have concluded, therefore, the justice system is generally ill equipped to address the multiple needs of this population, and few specialized treatment programs exist in jails, prisons, or court or community corrections settings that provide integrated mental health and substance abuse services (2004).

Braude and Miller (2011) have also raised important issues about cross-discipline screening. They noted the historic territorial issues and disagreements among disciplines about which disorder is primary, or more serious, or whether one precipitated the other. When clients are caught in the middle of different or incomplete systems of care, they do not get effective help for their full range of needs (2011: 4). Moreover, the failure to resolve disciplinary differences precludes the implementation of integrated treatment–specialized interventions that work concurrently for both substance use and mental health recovery (Braude and Miller, 2011).

Present Study

This study arises from an evaluation of a Bureau of Justice Assistance, Second Chance Act, prisoner reentry program for adult, male inmates with co-occurring disorders in a county jail in Massachusetts. The subjects were randomly selected for participation. Inmates were screened for co-occurring disorders. If a co-occurring diagnosis was achieved, the inmate was eligible for the program. There were 184 eligible cases who were then randomly assigned to the experimental (n=92) or control (n=92) groups. The final sample size was 170 inmates because 14 treatment group cases ultimately were not released as originally scheduled owing to unresolved infractions. Because their release was delayed, they would have had much shorter periods at risk for recidivism after reentry. We required a minimum of six months post release for participation in the study to ensure reliable measurement of recidivism.

The opportunity arose to investigate the construct validity of the Comprehensive Addictions and Psychological Evaluation (CAAPE). The CAAPE is a screening instrument specifically designed to assess persons with co-occurring disorders (Hoffmann, 2000). The CAAPE provides detailed indications for abuse for nine substances (alcohol, marijuana, cocaine, heroin, stimulants, sedatives, hallucinogens, inhalants, and a category for mixed substance abuse). The CAAPE also covers six Axis I and six Axis II DSM-IV conditions—the more prevalent mental health conditions likely to impact recovery from substance use disorders. The CAAPE has been applied to adjudicated adolescents in secure facilities (Abrantes, Hoffmann, & Anton, 2005) and in a comparative analysis of the relative prevalence of substance use disorders among prison inmates in the United Kingdom and the United States (Jones & Hoffman, 2006).

We are not aware of any rigorous, peer-reviewed validation studies of the CAAPE except for the following comparative analysis. In an evaluation of an integrated day treatment program for co-occurring disorders, subjects were given the structured clinical interview for DSM-IV (SCID) and the CAAPE (Gallagher, Penn, Brooks, & Feldman, 2006). This study, published in this journal, found that the concordance between SCID and CAAPE on substance use disorders was very high (95%), but for mental health disorders, the concordance between SCID and CAAPE was much lower (40%, 8 out of 20 cases). Overall, the study concluded as follows. First, the CAAPE provides accurate and complete data for arriving at substance abuse diagnoses. Second, the CAAPE is less burdensome in terms of administration and interviewer training time. Third, the CAAPE needs further specification in the mental health modules in order to generate enough data to establish DSM diagnoses rather than just screen for them. However, the addition of a psychotic disorders module in a revised version addressed this shortcoming. Fourth, the attraction of the CAAPE is that it is relatively brief, and its format leaves less room for interpretation and clinical judgment, which might lead to more reliable diagnoses.

The present study extends the work of Gallagher, Penn, Brooks, & Feldman (2006) and examines the CAAPE's construct validity among a sample of jail inmates. In common psychometric usage, validity is traditionally defined as "the degree to which a test measures what it claims, or purports, to be measuring" (Brown, 1996, p. 231). Traditionally, validity is subdivided into three categories: content, criterion, and construct (Brown 1996, pp. 231-249). Content validity includes any assessment that focuses on the content of the measure and evaluates whether the measurement reflects a representative sample of whatever the concept should include. Criterion (or concrete validity) is the extent to which a measure is related to an outcome of interest.

Criterion validity can be specified as either concurrent or predictive. Concurrent validity refers to a comparison between the measure in question and a criterion variable assessed at the same time, while predictive validity is the degree of association between the scores and some other measure that the scores are designed to predict at a later point in time. Last, construct validity is defined as the empirical demonstration that a test or scale is actually capturing the construct it claims to be measuring.

The concept of validity is well established. In the behavioral and social sciences all three types of validity discussed above are now taken to represent different facets of a single unified form of construct validity (Messick, 1989). In social and behavioral research a construct can be a psychometric attribute, proficiency, ability, or skill that happens in the human brain and is defined by established theories. A construct can also be a social phenomenon that arises in the social structure and affects people in empirically observable ways. Examples of social constructs could be strain, culture of poverty, concentrated disadvantage, culture of violence and so on. In the present study, since the CAAPE purports to measure the co-morbidity of two related constructs: mental health disorders and substance abuse, we adopt the unified view of validity and specify our inquiry as follows. If co-occurring disorders are related to criminal behavior as suggested by a growing body of research, then there should be two empirical linkages. First, analogous to concurrent validity, each component of the CAAPE scores should be associated with prior criminal history. Second, the CAAPE should also have predictive validity—the extent to which the scores are associated with post-release recidivism.

Independent Variables

CAAPE Drug Abuse

- CAAPE screens drug abuse with four abuse levels: None, Mild, Moderate, and Severe scored from 0-3 for nine drugs (Alcohol, Marijuana, Cocaine, Stimulants, Sedatives, Heroin, Hallucinogens, Inhalants, and Mixed). The scores are summed to produce a Total Drug Abuse Score (range = 1-27). The minimum score is “1” because all cases must have a COD diagnosis.

CAAPE Mental Health

- CAAPE screens nine mental health disorders (Major Depressive, Manic, Panic, Post Traumatic Stress, Anxiety, Obsessive/Compulsive, Psychosis, Anti-Social Personality, and Personality Disorder) and are scored absent / present. The items are then evaluated to produce an overall Mental Health Score (range = 1-3; Mild, Moderate, and Severe).

Dependent Variables

Prior Criminal History

- Count of arrests prior to the current offense.
- Count of the total number of charges for which the subject was convicted prior to the current jail commitment.

Reentry Recidivism

- Recidivism status is any post-release infraction (i.e., technical violation, arrest, or conviction).
- Count of arrests post-release.
- Count of convictions post-release.

Demographic Factors

- Race: coded as Other vs. White.
- Years of school completed.
- Marital Status: Single vs. ever married.
- Age in years at intake.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Dev.
Demographic					
Race Dummy	170	0	1	0.49	0.501
Highest Grade	170	4	17	11.35	2.076
Marital Dummy	170	0	1	0.18	0.387
Age at Intake	170	19.5	66.1	33.16	10.069
CAAPE					
Substance Abuse Score	170	1	21	7.44	4.847
MH Score	170	1	3	2.01	0.754
Criminal History					
Prior Arrest Count	170	0	65	15.26	13.519
Prior Conviction Count	170	0	72	15.29	14.424
Post Recidivist Status	170	0	1	0.53	0.501
Post Arrest Count	170	0	6	0.78	1.243
Post Conviction Count	170	0	37	1.95	4.82

Table 1 provides descriptive data for the variables. These data suggest that there is sufficient variation across the measures so that multivariate analyses will not be hindered by a situation in which the cases are too homogenous to analyze effects—especially the predictive efficiency of the CAAPE measures. In terms of background factors, the sample is 49 percent White, has less than a high school education on average (11.39 years of schooling), is predominantly never married (82%), and ranges in age from 19.5 to 66.1 years old with an average of 33.16. The data for the two prime CAAPE measures of interest here, the substance abuse and mental health scores, show that the subjects vary in the extent of their co-occurring disorders. The scores range from a low of one to a maximum of 21 on the substance abuse scale with a mean of 7.44, which indicates moderate substance abuse on average. The mental health scores range from a low of one (low disorders) to a maximum of 3 (severe disorders) and an average score of 2.01 which signifies moderate mental health problems.

The data for the five dependent variables also reflect sufficient variation so that analyses will not be hampered by limited scores reflective of minimum variation on the criterion measures. The number of prior arrests ranges from no prior crimes to a maximum of 65, with an average of 15.26 and a standard deviation of 13.519. Similarly, the number of criminal charges for which the sample was convicted previously ranges from no prior convictions to a maximum of 72 with a mean of 15.29 and a standard deviation of 14.4. The three post-release recidivism measures also show sufficient variation. Fifty three percent of the sample recidivated after release. The number of post-release arrests ranged from none to six with an average of .74. Those arrested were convicted of an average of 1.95 criminal charges with a maximum of 37.

Analysis Strategy

The present investigation is a validation study which focuses on the construct validity of the CAAPE. This is a methodological inquiry and requires a particular type of statistical analysis. First, four of the dependent variables are count measures. The appropriate statistical analysis for such data is generalized linear models (Long, 1997; Cameron & Trivedi, 1998). We examined both Poisson regression and negative binomial models. As noted by Walters (2007), Poisson models are often the best fit for these data and this was the case here. The fifth dependent variable was a binary measure which necessitated the use of logistic regression. Second, for all five dependent variables we tested mixed models which included both main effects and a continuous by continuous interaction effect of substance abuse score by mental health score. Because we are trying to validate the two dimensions of co-morbidity reflected in the CAAPE measures, the interaction effect facilitates the investigation by examining the joint effects of these two prime measures (Allison, 1977; Allison, 1999). We are not hypothesizing that either of these measures act as mediators or moderators for one another (see Baron and Kenny, 1986).

Instead, we are interested in the separate main effects of each of the CAAPE measures and whether they interact with one another to produce more than just additive effects when the measures co-vary. Third, in all models we investigate the CAAPE summary scores after controlling for demographic factors (i.e., race, education, marital status, and age) which are generally associated with criminal behavior in their own right.

Findings

Prior Criminal Behavior

The Poisson regression results for the criminal history of the subjects prior to the current incarceration are reported in Tables 2 and 3.

Table 2. Poisson Regression: Count of Prior Arrests

Parameter	<i>B</i>	S.E.	Wald		
			Chi-Square	df	Sig.
Intercept	1.3	0.1782	53.231	1	0.001
Race: White	-0.161	0.0429	14.158	1	0.001
Marital: Ever Married	0.041	0.058	0.505	1	0.477
Highest Grade	0.025	0.0098	6.649	1	0.010
Age at Intake	0.021	0.0023	86.46	1	0.001
Substance Abuse Score	0.044	0.0115	14.348	1	0.001
MH Score	0.200	0.0484	17.025	1	0.001
Substance Abuse Score * MH Score Interaction	0.017	0.0054	10.357	1	0.001

Table 3. Poisson Regression: Count of Prior Convictions

Parameter	<i>B</i>	S.E.	Wald		
			Chi-Square	df	Sig.
Intercept	0.874	0.1822	22.984	1	0.000
Race: White	0.082	0.0436	3.529	1	0.060
Marital: Ever Married	0.072	0.0574	1.579	1	0.209
Highest Grade	0.010	0.0099	0.002	1	0.966
Age at Intake	0.029	0.0022	163.426	1	0.000
Substance Abuse Score	0.057	0.0112	25.879	1	0.000
MH Score	0.236	0.0489	23.32	1	0.000
Substance Abuse Score * MH Score Interaction	0.010	0.005	4.067	1	0.044

Table 2 provides the results concerning the count of prior arrests. All of the coefficients are significant with the exception of marital status. Whites have significantly fewer prior arrests; as education increases the count of arrests increases; and likewise, as age increases so too does the count of prior arrests. Marital status is unrelated to prior arrest count. Given these effects, it is important to control for these variables to investigate properly our prime interest in the CAAPE summary measures. The main effects of substance abuse and mental health scores are significant and positive, while the interaction effect is also significant and positive. This result is very interesting and comports with the concept of co-morbidity. The significant and positive interaction effect is referred to as a reinforcing or synergistic interaction (Afshartous & Preston, 2011). The effect of an increasing mental health score is more pronounced when the substance abuse score also increases and vice versa. Once the interaction effect is examined, we turn to the main effects of the two variables included in the interaction. These are known as conditional main effects (Afshartous & Preston, 2011). We see that the mental disorders coefficient (0.200) is much higher than substance abuse (0.044). This signifies that the count of arrests increases more for increases in the mental health score than it does for increases in the substance abuse scale score.

Table 3 presents the Poisson regression results for the count of prior conviction charges. It is important to examine this variable because it captures the extent of prior criminality perhaps better than the arrest measure. That is, an offender could be arrested five times and be convicted of five charges, while another offender may also have five prior arrests but was convicted of ten or more charges. Clearly, these two criminal histories do not reflect the same degree of criminality.

The Table 3 results are perhaps more definitive than those in Table 2. Table 3 indicates that only one demographic variable, age at intake, it significantly related to the total number of charges for which the offender had been convicted prior to his present incarceration. Age at intake can be a proxy for criminal career length and this result makes substantive sense. Like in Table 2, there is a significant reinforcing interaction effect of the mental health and substance abuse scores. And again, the conditional main effect of mental health is stronger (0.236) as opposed to substance abuse (0.057).

Analogous to the concept of criterion validity, the CAAPE identifies two dimensions of co-occurring disorders: a mental health disorders score and substance abuse score. At the time of the entry of the subjects into the county jail, these dimensions were significantly related to two different measures of prior criminal history.

Post Release Recidivism

This research is also interested in the extent to which the CAAPE validly identifies the components of co-occurring disorders so that the scores can be used to predict or explain the criminal behavior of the subjects upon release back into society. The present subjects served on average about six months incarceration prior to release. Since co-occurring disorders are significant criminogenic factors, and since these disorders are likely a chronic condition, and since only focused, therapeutic intervention is likely to remediate the disorders, then higher scores on the mental disorders and substance abuse dimensions should be related to post release recidivism—hence, the predictive validity of the CAAPE. We have three recidivism measures available. As above, we have the count of both arrests and conviction charges. But, we also have a dichotomous measure of recidivism or not. Moreover, in the following analyses we can also control for the extent of prior criminality as a competing variable to the CAAPE scores. Prior criminal behavior is usually the strongest predictor of recidivism, so it will be instructive to see how well the CAAPE measures compete with this variable.

Table 4. Logistic Regression of Recidivism Status

Parameter	B	S.E.	Wald	df	Sig.	Exp(B)
Race: White	-0.325	0.349	0.864	1	0.353	0.723
Highest Grade	0.025	0.086	0.084	1	0.772	1.025
Marital: Ever Married	0.550	0.512	1.156	1	0.282	1.733
Age at Intake	-0.054	0.021	6.486	1	0.011	0.948
Prior Arrests	0.012	0.013	0.841	1	0.359	1.012
Substance Abuse Score	0.226	0.102	4.969	1	0.026	1.254
MH Score	1.087	0.416	6.824	1	0.009	2.964
MH Score * Substance Abuse Score Interaction	0.102	0.046	4.845	1	0.028	0.903
Constant	0.782	1.461	0.287	1	0.592	0.457

Table 4 provides the logistic regression results for recidivism status—whether the subject had any arrests or not after release into the community. The only demographic factor that is significant is age at intake. The older an inmate is, the less likely he is to be a recidivist. Interestingly, the extent of prior criminality is not a significant predictor of recidivism status. However, the CAAPE measures are significant as found previously. The mental health scores substance abuse scores have a significant reinforcing interaction. Likewise, the conditional main effects are also significant and indicate that the strongest predictor of recidivism status is mental health score (1.087) as compared to substance abuse (0.226). Logistic regression also provides the odds associated with a given predictor. These odds confirm these effects as well. A high mental health score produces 2.964 greater likelihood of becoming a recidivist as compared to substance abuse for which the odds are 1.254.

Table 5. Poisson Regression: Count of Recidivism Arrests

Parameter	<i>B</i>	S.E.	Wald		
			Chi-Square	df	Sig.
Intercept	-0.529	0.8475	0.39	1	0.532
Race: White	-0.314	0.1857	2.859	1	0.091
Marital: Ever Married	-0.394	0.2918	1.825	1	0.177
Highest Grade	-0.030	0.0502	0.368	1	0.544
Age at Intake	-0.043	0.0128	11.328	1	0.001
Prior Arrests	0.021	0.0058	12.736	1	0.000
Substance Abuse Score	0.140	0.0534	6.832	1	0.009
MH Score	0.831	0.2451	11.501	1	0.001
Substance Abuse Score * MH Score Interaction	0.061	0.0245	6.251	1	0.012

Table 5 reports the Poisson regression model for the count of arrests after release. These results are very similar to Table 4. Age at intake is significant and negatively associated with the number of arrests after release. Prior criminal history is significant and positively associated with the number of recidivist arrests. The measures of prime interest, the CAAPE scores, mirror the findings from all previous analyses. Mental health disorders and substance abuse show a reinforcing interaction such that high scores on each dimension is significantly associated with the count of arrests. Likewise, the contingent effects reveal that mental health disorders has a stronger effect (0.831) as compared to substance abuse (0.140).

Table 6. Poisson Regression: Count of Recidivism Convictions

Parameter	<i>B</i>	S.E.	Wald		
			Chi-Square	df	Sig.
Intercept	2.199	0.5397	16.601	1	0.000
Race: White	-0.423	0.1235	11.736	1	0.001
Marital: Ever Married	-1.051	0.1782	34.771	1	0.000
Highest Grade	-0.147	0.032	21.008	1	0.000
Age at Intake	-0.083	0.0089	86.3	1	0.000
Prior Arrests	0.02	0.0038	27.274	1	0.000
Substance Abuse Score	0.207	0.0386	28.703	1	0.000
MH Score	1.387	0.1708	65.961	1	0.000
Substance Abuse Score * MH Score Interaction	0.097	0.0171	32.109	1	0.000

The most interesting findings are contained in Table 6 concerning the extent of the charges for which the subject was convicted upon release into the community. First, all demographic factors are significant and in the expected direction: Whites have fewer charges; subjects that were ever married have fewer charges; the higher the education the fewer recidivism charges; the older a subject is the fewer the charges; and the higher the number of prior arrests the greater the number of post release convictions. The findings for the CAAPE measures are identical to those reported above. The two dimensions of co-morbidity, mental health disorders and substance abuse show a significant reinforcing interaction. The conditional main effects indicate that the mental health disorders factor (1.387) is stronger than substance abuse (0.207).

Conclusion

The goal of this study was to add to a growing body of research concerning the relationship between co-occurring disorders and criminal behavior by investigating the construct validity of the CAAPE. The results of rigorous multivariate models indicated that the CAAPE appears to have construct validity because it captured two principal components of co-morbidity: mental health disorders and substance abuse.

The findings with respect to five different criminal history measures were definitive. First, the CAAPE measures were significant, mutually reinforcing factors of criminal behavior. Second, the mental disorders component was stronger than the effect of substance abuse. Third, the CAAPE measures remained significant after controlling for many other variables that are usually related to criminal behavior.

This study indicates that further research is warranted to provide additional validation data for the CAAPE. Such research should cross-validate the CAAPE with justice involved persons with other co-occurring disorder screening instruments.

However, the results also suggest a pressing need to screen offenders upon entry to correctional facilities and then again before release. The CAAPE measures were significantly related to prior criminal record and it is likely that co-morbidity was an important criminogenic factor. Moreover, because co-morbidity was also related to post release recidivism, it is also likely that co-morbidity represents a chronic condition continuing to drive criminality even after incarceration ends if it is not properly treated. Thus, clinicians would be wise to screen all inmates with tools such as the CAAPE so that co-occurring disorders can be identified and focused treatment undertaken. This is particularly the case when the mental health issues are primary, because both institutional adjustment and future recidivism upon community reentry seem clearly connected causally.

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