Evidence-Based Risk Assessment in a Mental Health Court

A Validation Study of the COMPAS Risk Assessment

By Warren A. Reich, Sarah Picard-Fritsche, Virginia Barber Rioja, and Merrill Rotter

CENTER
FOR
COURT
INNOVATION

Evidence-Based Risk Assessment in a Mental Health Court: A Validation Study of the COMPAS Risk Assessment

By Warren A. Reich, Sarah Picard-Fritsche, Virginia Barber Rioja, and Merrill Rotter

© November 2016

Acknowledgements

Table of Contents

Executive Summary

People with serious mental illness have become increasingly overrepresented in the criminal justice system in the past 50 years. In response, criminal justice and mental health systems have sought to develop alternatives to traditional case processing. Among the most well-known strategies is the mental health court model, which combines community-based treatment with ongoing judicial monitoring. Research has generally supported the conclusion that mental health courts are effective in reducing recidivism, although less is known about the underlying mechanisms that contribute to their success.

One potential mechanism underlying the effectiveness of mental health courts is their capacity to assess and match each program participant to a case management and treatment plan that specifically addresses factors shown to contribute to ongoing criminal behavior, such as antisocial thinking and personality patterns, criminal history, residential instability, and substance abuse.

Most jurisdictions employ actuarial assessment tools to help determine the risk of re-offense posed by individuals in the justice system. One of the most popular tools is the Correctional Officer Management Profiling for Alternative Sanctions (COMPAS). The COMPAS is a statistically validated 116-item assessment tool. Prior studies have shown that this instrument predicts general and violent recidivism with fair to good accuracy (Brennan, Dieterich, and Ehret 2009; Zhang, Roberts, and Farabee 2014). However, the extent to which the COMPAS is specifically valid for use among individuals with serious and persistent mental illness is not presently known. To fill this gap, the present study investigates five research questions:

1. **Risk Profile:** What is the distribution of risk for re-arrest among New York City mental health court participants (e.g., percent classified as low, medium, and high risk)?

2. **Needs Profile:** Which of the COMPAS criminogenic needs domains are most prevalent among New York City mental health court participants?

3. **COMPAS Validation:** Is the COMPAS an accurate predictor of re-arrest among mental health court participants?

4. **Major Predictors of Recidivism:** Which of the COMPAS domain scores are most predictive of re-arrest in the mental health court population?

5. COMPAS v. Static Factor-Only Assessment: Does the COMPAS predict re-arrest beyond a statistical composite score based on static factors alone?

Methods

Two hundred forty-two COMPAS assessments were performed between 2010 and 2013 at three New York City sites: Brooklyn Mental Health Court, Bronx Mental Health Court, and Queens Felony Mental Health Court. COMPAS data were then matched to criminal history and recidivism data provided by the New York State Division of Criminal Justice Services. We performed descriptive, multivariate, and Area Under the Curve (AUC) analyses to assess the validity of the COMPAS for predicting re-arrest over a two-year tracking period.

Findings

Sample Characteristics

Overall, our sample of mental health court participants had an average age of 35 years, were ethnically and racially diverse, and had a significant prior history of criminal activity and drug use. Specifically, most participants (71%) had a prior arrest; nearly 60% were diagnosed with a co-occurring substance abuse disorder; and the most frequent primary diagnoses were bipolar disorder (32%), psychosis (30%), and major depression (26%).

The COMPAS Assessment

The COMPAS General Recidivism risk score is computed based on a range of measures drawn primarily from four domains: prior criminal history, criminal associates, drug involvement, and juvenile delinquency. The COMPAS Violent Recidivism risk score is computed based on measures drawn primarily from prior history of violence, history of non-compliance, vocational/educational problems, age at intake, and age at first arrest. For both risk scores, the precise measures and risk algorithms are proprietary. The COMPAS also contains 17 domain-specific scores (see Appendix A for a list of the 17 domains), which may either reflect static factors (e.g., prior history of violence) or dynamic needs (e.g., social isolation). Each domain-specific score ranges from 1 (lowest) to 10 (highest). These scores are then collapsed into low, medium, and high categories.

Distribution of Risk and Need in the Mental Health Court Sample

- **Risk Distribution:** Overall, 27% of participants were re-arrested at one year, and 42% were re-arrested at two years. The COMPAS classified two-thirds (67%) of the sample as low risk for re-arrest, 20% as medium risk, and relatively few (13%) as high risk. On the violence risk scale, nearly three-quarters (73%) were classified as low risk for violence.

- **Prevalent Need Factors:** In addition to mental health issues, more than half of participants scored in the "high" range on three COMPAS needs scales, criminal personality (55%), criminal thinking (54%), and substance abuse (53%).

- **Less Prevalent Risk and Need Factors:** More than half of participants scored in the "low" range on several other COMPAS risk and need scales, including criminal involvement (89%), socialization failure (78%), family criminality (76%), history of violence (73%), criminal associates (66%), social adjustment problems (62%), residential instability (61%), and current violence (53%).

Predictive Validity of the COMPAS

In general, the COMPAS General Recidivism scale was a good predictor of re-arrest across both the one-year and two-year recidivism tracking timeframes.

- **Re-Arrest Rate by Risk Category:** Rather than a steady increase in the re-arrest rate across the 10-point scale, as would be expected according to the design of COMPAS scoring, there appeared to be a leveling off at the seventh point (i.e., there was little difference and no upward slope in the actual re-arrest rate among individuals with a 7, 8, 9, or 10 on the 10-point scale). When condensing the 10-point scale to the three risk categories, while approximately 30% of the low-risk participants were re-arrested, both medium- and high-risk individuals were re-arrested at a rate of approximately 70%.

- **Predictive Accuracy of the 10-Point Scale:** The predictive accuracy of the 10-point General Recidivism scale, measured by the Area Under the Curve (AUC), was found to exceed the accepted standard for good predictive validity of .70 for re-arrest at both one and two years (AUC = .70 and .73, respectively).

- **Predictive Accuracy of the Risk Categories:** Predictive accuracy when classifying risk into one of the three summary risk categories (low, medium, and high) was lower than that obtained for the 10-point scale but still within the acceptable range (AUC = .65 and .67 for one- and two-year re-arrest, respectively). AUC values of up to .73 were obtained by shifting the cutoff scores for low, medium, and high risk designations from the cutoffs that were recommended by COMPAS developers, raising for consideration the possibility of a revised set of cutoff scores for a mental health court population.

- **Impact of Specific COMPAS Domains:** The history of violence, criminal associates, substance abuse, criminal personality, cognitive behavioral, family criminality, socialization failure, and social environment domain scores were all significantly correlated with both one- and two-year re-arrest. Of these, history of violence and socialization failure remained statistically significant in a multivariate analysis. The socialization failure scale includes measures of family criminality, juvenile delinquency, and school problems.

- **Static Factor Risk Score:** An *ad hoc* static risk score was constructed as a statistical composite of static factors drawn from administrative records (including age, criminal history, and instant case). This score was a good predictor of two-year re-arrest, AUC = .79, clearly superior to the COMPAS. Yet, the COMPAS General Recidivism score and the socialization failure domain score both contributed to the prediction of two-year re-arrest after statistically controlling for actuarial risk. This finding suggests that the COMPAS contains criminogenic information not found in non-interview data. It was nonetheless evident that re-arrest could be efficiently predicted from a small number of static risk factors.

Chapter 1
Introduction

People with serious mental illness have become increasingly overrepresented in the criminal justice system over the past 50 years (Council of State Governments 2002; Lurigio 2012). One recent estimate places the prevalence of serious mental illness at 16 percent of those confined to American jails and prisons, or 350,000 inmates (Castellano & Anderson 2013). In response to this crisis, criminal justice and mental health systems have partnered in the development of alternatives to traditional case processing for offenders with serious mental illness (Fiduccia & Rogers 2012). Among the most well-known of these alternatives is the mental health court model. There are currently more than 300 such courts in the United States (Hughes & Peak 2013). Although their eligibility criteria, treatment protocols, and other policies differ considerably (Edgely 2014), the primary goal of mental health courts is to divert offenders with a mental illness from conventional prosecution to court-supervised mental health treatment (Baillargeon et al., 2009). The treatment model is premised on the assumption that addressing the clinical needs of these offenders will result in reduced justice system involvement in the future.

Mental health courts have generally been embraced by overburdened criminal justice systems nationwide (Castellano & Anderson 2013). The preponderance of evidence supports the conclusion that mental health courts reduce recidivism (Sarteschi, Vaughn, & Kim 2011; see also Rossman et al. 2012 for a case-control study), although it is not clear how the underlying processes and mechanisms contribute to their impact (Edgely 2014). Evidence to date has failed to demonstrate that treating symptomatic serious mental illness by itself reduces criminogenic risk—challenging a basic premise of the mental health court model (e.g., Lurigio 2011). Nor is serious mental illness a reliable predictor of subsequent justice system involvement, directly accounting for only a small minority of crimes (Bonta, Law, & Hanson 1998; Peterson et al. 2014; Rezansoff et al. 2013; Skeem et al. 2014).

Moreover, it has become clear in recent years that the factors known to contribute to criminal justice involvement among the seriously mentally ill are typically the same as those for the criminally involved population generally (Moore & Hiday 2006; Steadman et al. 2011). Accordingly, heightened criminal justice involvement among those with serious mental illness can be accounted for by their higher levels of prior justice system involvement and the

clinical and socioeconomic factors linked to this involvement, such as substance abuse, antisocial thinking and personality patterns, and residential instability (Morgan et al. 2010; Skeem, Manchak, & Peterson 2011; Skeem, Winter, & Kennealy 2014; Wilson et al. 2011).

It follows, then, that a mental health court is best-positioned to reduce future criminal involvement to the extent it accurately screens for and effectively addresses known criminogenic risk or need factors. The use of a statistically validated risk and needs assessment tool would greatly facilitate a court's capacity to provide intensive intervention appropriate to each offender's level of risk, and its ability to individualize treatment plans that respond to the specific clinical needs, capacities, and learning styles of offenders with mental illness.

The Present Study

The Correctional Officer Management Profiling for Alternative Sanctions (COMPAS) is a 116-item actuarial assessment tool, widely used by correctional agencies nationwide. The current study, a collaboration between the Center for Court Innovation and EAC Network, is the first validation of the tool focused on offenders with serious mental illness. The purpose of this study was to establish the accuracy of the tool specifically for identifying criminogenic risk and needs among offenders suffering from serious mental illness.

The COMPAS Risk and Needs Assessment

The COMPAS is a "fourth-generation" approach to risk and need assessment created and maintained by Northpointe, Inc. The advance over prior generation instruments stems from its sophistication in statistical prediction methods and extensive coverage of dynamic criminogenic needs in addition to static factors such as criminal history (Brennan, Dieterich, & Ehret 2009). These include criminogenic risks and needs such as criminal history, antisocial attitudes, antisocial personality pattern, criminal social networks, school or work deficits, family dysfunction, lack of prosocial leisure activities, and substance abuse.

A brief description of COMPAS domains, which appears in the Appendix of this report, suggests that many of the COMPAS subscales defy neat categorization as a static risk factor or a "criminogenic need" as laid out by the traditional RNR model (e.g., the cognitive behavioral scale contains both static and dynamic content). It should further be noted that because the COMPAS is a proprietary tool, the specific formula the instrument uses for assigning risk was not available to the authors of this report.

The COMPAS has been statistically validated in several samples. In an early study, COMPAS creators Brennan, Dieterich, and Ehret (2009) found that the general and domain-specific risk/need scales predicted time to arrest for a new felony offense in a large sample of probationers. Moreover, the predictive accuracy of the COMPAS was rated fair, with an Area Under the Curve (AUC) of 0.68[1] for important probation subgroups (e.g. male, female, African-American, and white probationers). Lansing (2012) confirmed and extended these findings in a multisite sample of probationers in New York State, with results indicating good accuracy of the COMPAS (AUC = 0.71). Zhang and colleagues likewise demonstrated the predictive accuracy of the tool (AUC = 0.70 for general recidivism; AUC = 0.65 for violent recidivism), with the COMPAS outperforming standard demographic factors (age, gender, number of prior arrests) in predicting re-arrest at two years across a large sample of parolees (Zhang, Roberts, & Farabee 2014). A single study found that the COMPAS did *not* significantly predict one-year re-arrest (Fass et al. 2008) and that the tool's estimates of criminogenic risk varied by race and gender groups. It should be noted that these results were obtained from a much smaller sample (N = 276, 15% of whom were re-arrested) and are therefore less reliable than those based on larger samples.

The COMPAS produces two summary risk scores: General Recidivism and Violent Recidivism. The COMPAS General Recidivism risk score is computed from multiple measures involving prior criminal history, criminal associates, drug involvement, and juvenile delinquency. The COMPAS Violent Recidivism risk score is computed from multiple measures involving history of violence, history of non-compliance, vocational/educational problems, age at intake, and age at first arrest (Northpointe 2011). The COMPAS also assigns scores to a number of specific domains that provide detailed information in support of individualized treatment plans (see Appendix for a description of these domains).

At the time the current study was conceptualized, the COMPAS had already been adopted by EAC Network, the agency that provides clinical case management for two of the three mental health courts participating in this study (Bronx and Queens).

---

1 In general, an area under the curve (AUC) statistic of 0.70 or higher is considered good; AUC of 0.50 is no better than chance.

Prior research confirming the comparability of risk for criminal justice involvement among mentally ill and other criminal justice-involved populations suggests that this assessment tool should perform well for mental health court participants. However, this thesis has yet to be empirically examined. Accordingly, the present study investigates the following research questions:

1. **Risk Profile:** What is the distribution of risk for re-arrest among New York City mental health court participants (e.g., percent classified as low, medium, and high risk)?

2. **Needs Profile:** Which of the COMPAS criminogenic needs domains are most prevalent among New York City mental health court participants?

3. **COMPAS Validation:** Is the COMPAS an accurate predictor of re-arrest among mental health court participants?

4. **Major Predictors of Recidivism:** Which of the COMPAS domain scores are most predictive of re-arrest in the mental health court population?

5. **COMPAS v. Static Factor-Only Assessment:** Does the COMPAS predict re-arrest beyond a statistical composite score based on static factors alone?

Findings with regard to the research questions are detailed in Chapter 3, following a description of the study methodology (Chapter 2). The report concludes with discussion and policy implications (Chapter 4).

Chapter 2
Methods

Three New York City mental health courts participated in the study. Two were EAC Network sites—Bronx Mental Health Court and Queens Felony Mental Health Court. The third was the Brooklyn Mental Health Court, which is a demonstration project of the Center for Court Innovation. All three serve adults deemed competent to stand trial, and who have a (formerly Axis I) diagnosis such as schizophrenia, bipolar disorder, major depression, or schizoaffective disorder (other disorders are considered on a case-by-case basis). All three courts serve defendants with access to community-based healthcare (undocumented defendants with no private or public health insurance are usually excluded). The three participating courts accept defendants with a diverse range of current charges, including those facing misdemeanor, felony, and violent felony charges. Participation in each of the courts requires defendants to undergo a mental health evaluation, enter a plea of guilty, and agree to participate in community-based supervision and appear regularly in court for a period that typically lasts 12-18 months. Successful compliance with all court program requirements results in a dismissal or reduction of charges.

Data Collection

A total of 242 COMPAS assessments (specifically, COMPAS Core Community assessments) were performed at the three sites between 2010 and 2013. In the Bronx and Queens sites we retrieved archived COMPAS data which were collected as part of routine risk/need screening at program intake. In addition, COMPAS interviews were conducted for the purpose of this study with participants at the Brooklyn Mental Health Court (N=56) between 2012 and 2013. Official instant case and criminal history records were used to complete the corresponding COMPAS items (e.g., number of prior felony assault arrests). It should be noted that items involving juvenile justice involvement (e.g., number of times arrested as a juvenile) were in many cases not answered as they do not appear in an adult's official criminal history in New York State. COMPAS assessment data was then matched to criminal history, instant case, and recidivism data through the New York State Division of Criminal Justice Services (DCJS). As is the typical practice of DCJS, all individual

identifiers were removed from the complete criminal history data records prior to transmission of data files back to the researchers.

Plan of Analysis

Our analysis begins with a summary of the sample demographic and criminal history characteristics, as well as one- and two-year re-arrest statistics. We then report the distribution of cases, both across deciles and at each risk level (low, medium, high), indicated by the COMPAS general risk and domain-specific need scales. Next we report on the ability of the COMPAS decile score and COMPAS general risk level categories to accurately predict re-arrest. That is, we examine whether those mental health court participants categorized as high-risk are, indeed, significantly more likely to be re-arrested within a two-year period than those classified as low- or medium-risk. Next is a finer-grained analysis of both the summary and the domain scales in order to evaluate which of the scales, if any, are best able to predict re-arrest. Our analyses also explore whether psychiatric diagnosis is predictive of subsequent re-arrest, and if so, whether it mitigates the predictive ability of the COMPAS, which does not account for such clinical factors. Finally, we examine the extent to which COMPAS scores are capable of predicting re-arrest after statistically controlling for an *ad hoc* risk score based on purely static factors from administrative data (e.g., criminal history, age). Such static factors have been shown to be reliably predict recidivism in a general criminal justice population (Bonta, Law, & Hanson 1998; Caudy, Durso, & Taxman 2013). If the COMPAS predicts recidivism after controlling for information drawn from official records, we will have demonstrated that it contains additional useful information not captured by these records.

Findings

Baseline Sample Characteristics

Table 3.1 shows demographic, criminal history, and diagnostic characteristics for the full sample. The majority of the sample were male and born in the United States. More than a third (38%) were black. Psychiatric diagnoses were roughly evenly split between psychosis (35%), major depression (30%), and bipolar disorder (26%), with anxiety and other diagnoses accounting for the remainder. More than half (59%) of participants had a co-occurring substance abuse disorder. The majority of participants had prior arrests (71%); more than half (57%) were previously arrested on a felony charge. Instant case characteristics reflect mental health court policy, with more participants entering on a felony charge (61%) than on a misdemeanor (38%). Nearly two-thirds of participants entered the mental health court on either a property (33%) or violent (30%) charge; an additional 21% entered the court on drug charges. Overall, the picture of mental health court participants presented in Table 3.1 is one of a relatively young, racially diverse population with a history of criminal activity and drug use.

Re-Arrest Rates in the Study Sample

Re-arrest, the primary outcome of interest, was tracked over one and two years from the time of program entry for the entire sample. Table 3.2 shows the rates of general, felony, and violent felony re-arrest for both tracking periods. Due to the low incidence of violent felony re-arrest (6% at two years), this measure was not included as an outcome in our final analyses. The average time to any re-arrest (for those who were re-arrested) was slightly longer than one year, and the average time to any felony re-arrest (for those with a felony re-arrest) was approximately one and a half years.

Table 3.1. Study Sample Characteristics

Total Sample Size[1]	242
Demographics	
Average Age	35.26
Male	76%
Race	
Black	38%
White	31%
Hispanic	23%
Other	8%
Born in the USA	84%
Diagnosis	
Psychosis	35%
Major Depression	30%
Bipolar	26%
Anxiety	5%
Other	4%
Co-Occurring Substance Abuse	59%
Criminal History	
Any Prior Arrest	71%
Misdemeanor Arrest	63%
Felony Arrest	57%
Violent Felony Arrest	35%
Drug Arrest	46%
Weapons Arrest	31%
Any Prior Conviction	44%
Misdemeanor Conviction	40%
Felony Conviction	23%
Violent Felony Conviction	9%
Drug Conviction	24%
Weapons Conviction	8%
Instant Case	
Arrest Severity	
Misdemeanor	38%
Felony	61%
Violent Felony	25%
Arrest Charge Type	
Property	33%
Drug	21%
Any Violent	30%
Other	16%

[1] One participant was missing demographic information (N=241); a total of seven participants were missing criminal history and charge information on the instant case (N=235).

Table 3.2. Study Sample Re-Arrest

Total Sample Size	242
Re-Arrest at 1 Year	
Any New Arrest	27%
New Felony Arrest	13%
New Violent Felony Arrest	4%
Re-Arrest at 2 Years	
Any New Arrest	42%
New Felony Arrest	22%
New Violent Felony Arrest	6%
Average Time to Re-Arrest	
Any New Arrest (N = 126)	423 days (1.16 years)
New Felony Arrest (N = 75)	543 days (1.49 years)
New Violent Felony Arrest (N = 24)	325 days (0.89 years)

COMPAS Scales

Research Question 1: What is the distribution of risk for re-arrest among New York City mental health court participants?

Responses to COMPAS interview questions are entered directly into the proprietary software maintained by Northpointe, Inc. The software statistically combines groups of questions to produce two summary risk scales—a general recidivism score and a violent recidivism score—and 17 domain-specific subscales. Individual scores are calculated for each scale; the summary risk scales take multiple domains into account using Northpointe's proprietary algorithm. By design, all scores range from 1 to 10, locating the offender in a decile; that is, a General Recidivism score of 1 places the offender in the lowest 10% of the reference population in terms of likelihood of re-arrest, an offender with a score of 2 falls in the tenth to twentieth percentile, and so on. Scores are then converted to low, medium, and high categories. For example, on the Criminal Associates domain, scores of 1 to 4 are "low," scores of 5 to 7 "medium," and scores of 8 to 10 "high."

Figure 3.1. COMPAS General and Violent Risk Score Deciles
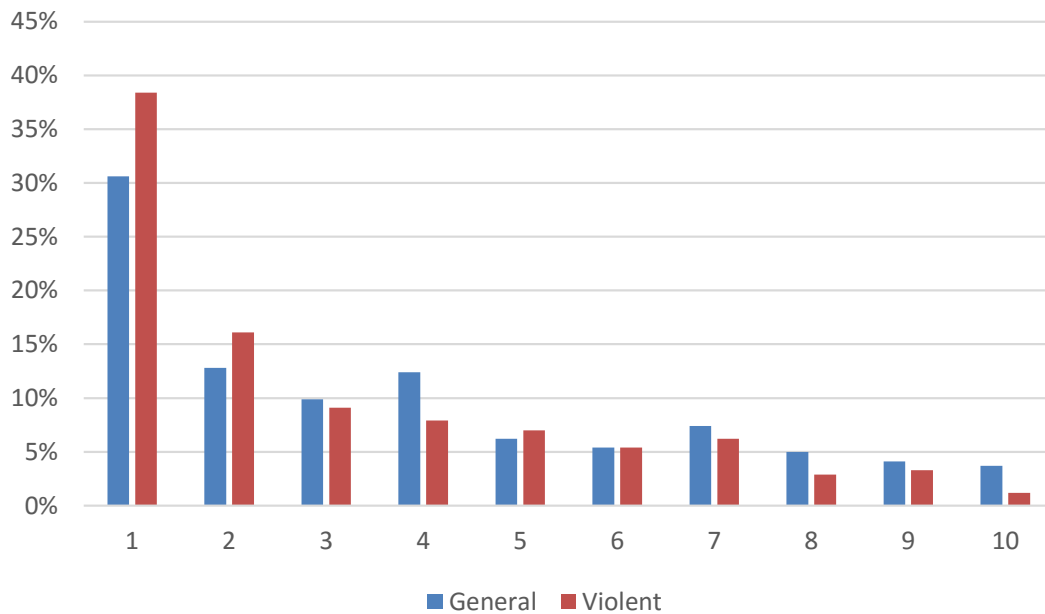
COMPAS General Risk Scores and Categories: Figure 3.1 illustrates the distribution of COMPAS General and Violent Recidivism risk scores in the sample by decile. As noted earlier, the COMPAS General Recidivism risk score is computed from prior criminal history, criminal associates, drug involvement, and juvenile delinquency; and the COMPAS Violent Recidivism risk score is computed from history of violence, history of non-compliance, vocational/educational problems, age at intake, and age at first arrest (Northpointe 2011). As noted earlier, given the proprietary nature of the COMPAS assessment system, the exact contribution of each factor to either risk score cannot be ascertained at this time.

It can be seen in the Figure 3.1 that for both indices the greatest proportion of participants fell in the first (lowest-risk) decile—31% and 39%, respectively. This is striking in light of the fact that COMPAS deciles were originally designed so that each would capture a roughly equal proportion of the offender population (i.e., approximately ten percent per decile).

For the purposes of simple categorization, the designers of the COMPAS then collapsed risk deciles into three risk categories: low risk, medium risk, and high risk. The upper portion of Table 3.3 shows the distribution of COMPAS summary risk and domain-specific need *categories* for the study sample. As shown, about two-thirds of mental health court participants were classified as low risk for both any re-arrest (N = 159; 67%) and re-arrest for a violent offense (N = 173; 73%). There were fewer participants classified at medium-risk

(General: N = 46, 19%; Violent: N = 45, 19%) or high-risk (General: N = 31, 13%; Violent: N = 18, 8%). Clearly, the distribution of risk scores in the current sample fell into a distribution that is notably different from that of the COMPAS reference population.

Table 3.3. COMPAS Risk Categories for the Mental Health Court Participant Sample

Scale	Risk Category		
Summary Scales	**Low Risk**	**Medium Risk**	**High Risk**
General Recidivism	67%	20%	13%
Violent Recidivism	73%	19%	8%
Domain Scales			
Criminal Involvement	89%	9%	2%
History of Violence	73%	19%	8%
Current Violence	53%	1%	46%
Criminal Associates	66%	15%	19%
Leisure and Recreation	47%	12%	41%
Social Isolation	29%	24%	47%
Substance Abuse	33%	15%	53%
Criminal Personality	21%	23%	55%
Criminal Thinking	23%	23%	54%
Cognitive Behavioral	43%	30%	27%
Family Criminality	76%	13%	11%
Socialization Failure	78%	10%	12%
Financial	45%	19%	37%
Vocational/Education	34%	17%	49%
Social Environment	47%	12%	41%
Residential Instability	61%	17%	22%
Social Adjustment Problems	62%	14%	24%

Research Question 2: Which of the COMPAS risk domains are most prevalent among New York City mental health court participants?

COMPAS Domain Score Categories: The lower portion of Table 3.3 shows that a substantial portion of mental health court participants scored in the high range on specific risk and need domains, including current violence (46%), social isolation (47%), substance abuse (53%), criminal personality (55%), criminal thinking (54%), and vocational/education (49%) domain scores (see Appendix for a brief description of these scales). This pattern of findings suggests that the risk and need patterns among defendants served by the mental

health courts in this study mirror risks and needs seen in the general offender population in some important respects. In contrast, the relatively limited criminal and violent histories, absence of familial and social criminal influences, and relative environmental stability reflected in other sub-domain scales (Criminal Involvement, History of Violence, Current Violence[2] Criminal Associates, Family Criminality, Socialization Failure, Residential Instability, and Social Adjustment Problems) were reflected in the relatively high proportions of low scores on these scales.

In reference to our initial research questions—what is the distribution of risk of re-arrest among mental health court participants, and what are their most prevalent risk domains— these findings suggest that, according to the COMPAS risk scores, New York City mental health court participants are at low risk of re-arrest generally and low risk for a new violent offense. They are also particularly vulnerable in the domains of substance abuse, criminal personality, and criminal thinking.

Predictive Validity of the COMPAS

Research Question 3: Is the COMPAS an accurate predictor of re-arrest among mental health court participants?

Re-Arrest Rates by General Risk Scores and Categories: The third research question seeks to determine whether the COMPAS General Recidivism risk score accurately predicts re-arrest in the current sample of mental health court participants. Two-year re-arrest is plotted by decile in Figure 3.2, which shows what appears to be a jump beyond a 30% re-arrest rate from the second to the third decile. Re-arrest rates for subsequent deciles are hard to interpret due to relatively low frequencies.

The corresponding plot by COMPAS risk *categories* is shown in Figure 3.3 (blue bars). Contrary to what has been reported in other COMPAS evaluation study results (e.g., Brennan, Dieterich, & Ehret 2009), the relationship between risk category and re-arrest was not linear in the present sample. Re-arrest at two years was significantly higher for medium- and high-risk than for low-risk participants ($p < .05$), but re-arrest rates did not differ

---

2 Scores on the Current Violence scale were, interestingly, split between low- and high-risk participants, with very few (1%) participants falling in the medium-risk category.

significantly between medium- and high-risk participants (a parallel pattern, not shown, was found for re-arrest at one year). As further shown in Figure 3.3, an "ad-hoc" revision of cut-off scores resulted in a linear pattern.

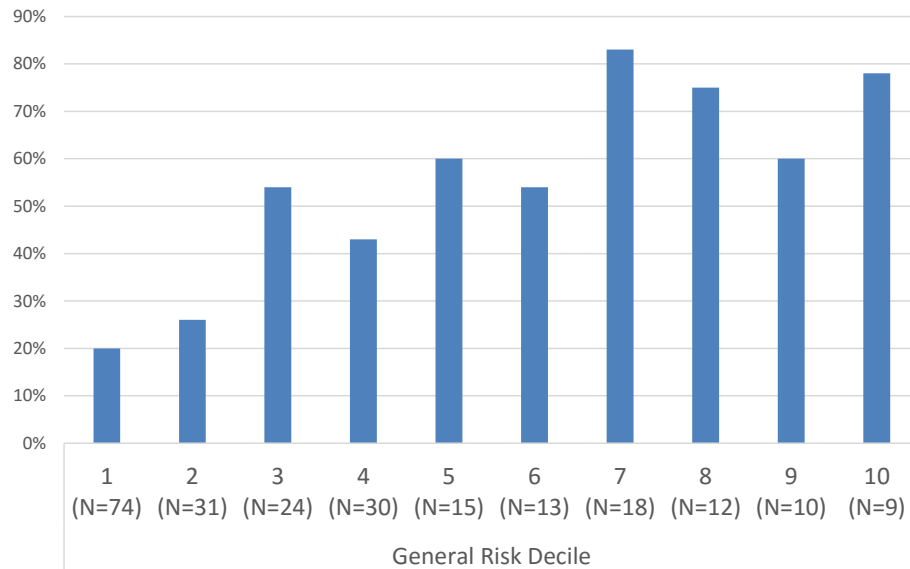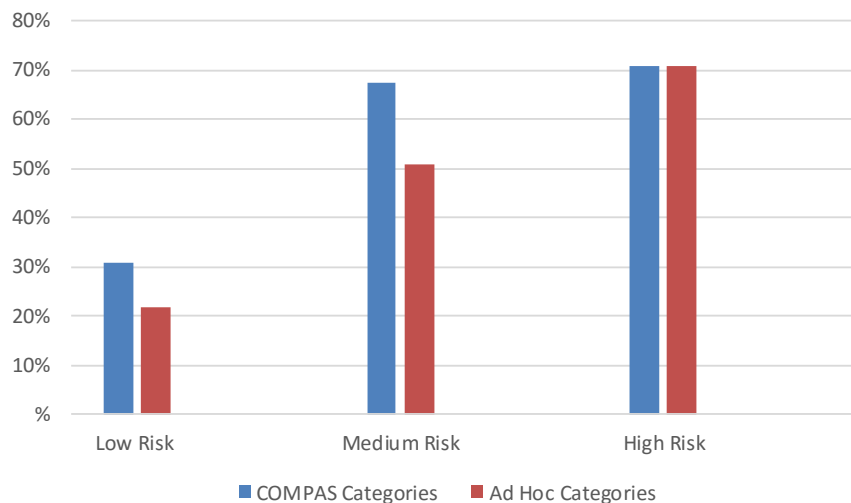**Figure 3.2. Re-Arrest at Two Years by COMPAS General Risk Score Deciles**

Figure 3.3. Re-Arrest at Two Years by COMPAS General Risk Categories

Overall Predictive Accuracy of General Risk Scores and Categories: In order to gauge the overall predictive accuracy of the COMPAS scores, we calculated the AUC for the General Recidivism scale—a scale that places individuals into one of ten risk categories—with respect to all four re-arrest outcomes. It can be seen in Table 3.4 that in each case, AUC exceeded the conventional standard of 0.70. The COMPAS General Recidivism score, then, proved to be an adequate predictor of re-arrest—literally, a randomly selected participant who was re-arrested had a 70% chance of scoring higher than one who was not re-arrested (McFall & Treat 1999).

The COMPAS General Recidivism categories—i.e., the classification of individuals into low, medium and high risk categories—demonstrated lower AUC than did the full 10-point scale. This is due in part to the lack of differentiation between the medium- and high-risk categories in predicting re-arrest (see Figure 3.3). In an exploratory analysis we calculated AUC for a number of alternative cut points differentiating the three risk categories. The optimal AUC was .69 for one-year and .73 for two-year re-arrest where the first and second deciles were "low" (N = 105), third through fifth "medium" (N = 69), and sixth and above "high" (N = 62; see Figure 3.3, red bars, and the third row in Table 3.4). These AUCs were nearly equal to the performance of the more granular ten-point decile scale, raising for consideration the possibility that the COMPAS norms for assigning risk level might be recalibrated for a mental health court population. We intend this only as a demonstration that higher AUC values for a mental health court population are possible with alternative cut points; determining what these points should be would require a new and larger sample.

Table 3.4. Area Under the Curve (AUC) for COMPAS General Recidivism Risk Deciles and Categories

Predictor	Re-Arrest at 1 Year		Re-Arrest at 2 Years	
	Any Re-Arrest	Felony Re-Arrest	Any Re-Arrest	Felony Re-Arrest
Risk Deciles	.70	.74	.73	.71
Risk Categories: Original	.65	.71	.67	.68
Risk Categories: Ad Hoc	.69	.72	.73	.69

Relationship of Risk and Need to Re-Arrest

> **Research Question 4:** Which of the COMPAS domain scores are most predictive of re-arrest in the mental health court population?

We now seek to determine whether the COMPAS summary or domain-specific scores predict re-arrest in the study population. The upper portion of Table 3.5 shows simple correlations between re-arrest and both general and violent recidivism risk scores. Both of the COMPAS summary risk scores significantly predicted re-arrest across all measures. That is, mental health court participants with higher summary risk scores were significantly more likely to have a new arrest. Among the domain scores, history of violence and socialization failure produced the strongest correlations with re-arrest at 1 and 2 years, though not as strong as those obtained from the summary risk scores. The current violence, leisure and recreation, social isolation, criminal thinking, financial, and residential instability domains were least strongly associated with re-arrest. More detail regarding the constituent factors that make up each domain in the COMPAS can be found in the Appendix.

The results shown in Table 3.5 identify the significant bivariate correlations between COMPAS scores and re-arrest, which point to potential intervention targets for the reduction of risk for future justice system involvement in the mental health court population. A separate, multivariate analysis that considers the scores simultaneously is necessary to identify which are superior to others (and hence most useful) in the prediction of re-arrest. To this end we performed a series of regression analyses to determine which of the COMPAS general and domain scores were the most powerful predictors of re-arrest. Only those domain scores previously found to have a significant correlation to the outcome of interest were included in the regression models. The upper portion of Table 3.6 (Model 1) shows the regression analyses that included only the General and Violent Recidivism Risk scores. The General Recidivism score was a slightly better predictor than Violent Recidivism of a new felony arrest at both one and two years, and of any re-arrest at two years. The significant odds ratios shown in this section of the table range between 1.22 and 1.31, indicating that a one-point increase on the COMPAS General Recidivism summary risk score was associated with a 20% to 30% increase in the odds of a participant's re-arrest at one year (felony) or two years.

Table 3.5. Correlations Between Re-Arrest and COMPAS Scores

Predictor	Re-Arrest at 1 Year		Re-Arrest at 2 Years	
	Any Re-Arrest	Felony Re-Arrest	Any Re-Arrest	Felony Re-Arrest
Number (%) Re-Arrested	66 (27%)	31 (13%)	102 (42%)	53 (22%)
COMPAS Summary Scores				
General Recidivism	0.32**	0.29**	0.40**	0.32**
Violent Recidivism	0.37**	0.22**	0.36**	0.29**
COMPAS Domain Scores				
Criminal Involvement	0.14+	0.13*	0.22**	0.16*
History of Violence	0.33**	0.31**	0.33**	0.31**
Current Violence	*ns*	*ns*	*ns*	*ns*
Criminal Associates	0.20**	*ns*	0.21**	0.12+
Leisure and Recreation	0.11+	*ns*	*ns*	*ns*
Social Isolation	*ns*	*ns*	*ns*	*ns*
Substance Abuse	0.13*	0.16*	0.22**	*ns*
Criminal Personality	0.14*	*ns*	0.13**	*ns*
Criminal Thinking	*ns*	*ns*	*ns*	*ns*
Cognitive Behavioral	0.22**	*ns*	0.24**	0.11+
Family Criminality	0.13*	*ns*	0.20*	0.14*
Socialization Failure	0.22**	*ns*	0.29**	0.14*
Financial	0.11+	*ns*	*ns*	*ns*
Vocational/Education	0.12+	*ns*	0.14*	*ns*
Social Environment	0.18**	*ns*	0.19**	0.12+
Residential Instability	*ns*	*ns*	*ns*	*ns*
Social Adjustment Problems	0.17**	*ns*	0.18**	*ns*

Note: + $p < .10$. * $p < .05$. ** $p < .01$.

Note: Violent felony re-arrest not included due to low frequency (4% at 1 year; 6% at 2 years).

The lower portion of Table 3.6 (Model 2) shows the regression analyses that only included those COMPAS domain scores with a significant correlation with re-arrest (see Table 3.5). The History of Violence domain—a summary of items reflecting adult and juvenile violent offenses—was the only domain scale to emerge as a significant predictor of all four re-arrest outcomes after statistically controlling for the other subdomains. Socialization Failure, a static factor derived from a composite scale consisting of parents' arrest and substance use history; educational under-achievement; conduct problems in school; and early delinquency

(Northpointe Institute for Public Management 2009), also significantly predicted re-arrest at two years. For both domains, a one-point increase in the scale score predicts roughly a 20% increase in the odds of re-arrest at two years. Overall, then, we conclude that the COMPAS General Recidivism Risk summary score (Model 1) is a good predictor of re-arrest for the mental health court population. Two domains—History of Violence and Socialization Failure—were also uniquely predictive of re-arrest. A follow-up analysis (not shown) demonstrated that, in fact, History of Violence and Socialization Failure *independently* predicted re-arrest at two years controlling for General Recidivism Risk. These two domains, then, appear to have added to the predictive value of the general summary score.

Table 3.6. Logistic Regressions Predicting Re-Arrest Using COMPAS Scores

Predictor	Re-Arrest at 1 Year		Re-Arrest at 2 Years	
	Any Re-Arrest	Felony Re-Arrest	Any Re-Arrest	Felony Re-Arrest
Number (%) Re-Arrested	66 (27%)	31 (13%)	102 (42%)	53 (22%)
Model 1: COMPAS Summary Scores				
General Recidivism	1.01	1.31**	1.26**	1.22*
Violent Recidivism	1.28**	1.03	1.14	1.12
Model 2: COMPAS Domain Scores				
Criminal Involvement	0.95	0.98	1.03	1.01
History of Violence	1.20**	1.22**	1.20**	1.22**
Current Violence				
Criminal Associates	1.10		1.08	1.08
Leisure and Recreation	1.03			
Social Isolation				
Substance Abuse	0.97	1.10	1.03	
Criminal Personality	1.03		1.01	
Criminal Thinking				
Cognitive Behavioral	0.97		0.94	0.89
Family Criminality	1.01		1.05	1.06
Socialization Failure	1.12		1.18*	1.07
Financial	1.03			
Vocational/Education	0.97		0.97	
Social Environment	1.06		1.05	1.06
Residential Instability				
Social Adjustment Problems	0.98		0.99	

Note: + p < .10. * p < .05. ** p < .01.

Note: Odds ratios presented.

Mental Health Diagnosis and Re-Arrest We found no significant influence of any of the diagnostic categories (major depression, bipolar, psychosis, anxiety/other) on any of the four re-arrest outcomes ($p > .22$). The same was true for co-occurring substance use disorder on three of the four outcomes. The exception was that 47% of those with this diagnosis (vs. 35% of those without this diagnosis) were re-arrested at two years; a marginally significant difference ($p < .10$) which suggests that mental health court participants with substance use problems were somewhat more likely than those without co-occurring disorders to be re-arrested. Including co-occurring substance use disorder in the regression analyses shown in Table 3.5 did not substantially change the results—General Recidivism Risk, History of Violence, and Socialization Failure all remained significant (results not shown). In general, then, information on psychiatric diagnosis neither adds to nor subtracts from the predictive efficacy of the COMPAS.

> **Research Question 5:** Does the COMPAS predict re-arrest beyond a statistical composite score based on static factors alone?

As noted above, the COMPAS identifies a number of criminogenic needs apart from those that can be derived from administrative records alone. To investigate whether the COMPAS has predictive power beyond administrative records, we first created our own *ad hoc* risk score based on static criminal history factors. Based on prior research demonstrating that scores based on objective static factors (e.g., criminal history, demographics) outperform those using subjective judgments or "clinical" factors (e.g., substance abuse, antisocial patterns) in predicting re-arrest (Mamalian 2011), we began by selecting the 21 demographic, criminal history, and instant case variables that were significantly correlated with re-arrest at two years. We then used regression modeling to create a parsimonious set of static factors that, when combined and scored as deciles (in line with COMPAS scoring), yielded the best possible prediction of re-arrest. This new static factor risk score was, indeed, strongly correlated with re-arrest at two years (correlation coefficient: 0.50, p < .001; AUC = 0.79).[3] This AUC is substantially higher than that obtained for the COMPAS general risk scales.

---

3 The static risk score was derived through a regression analysis performed on half the sample and then applied to the other half. It was a weighted combination of five factors: younger age, any prior drug arrest, any prior weapons arrest, number of prior vehicle/traffic arrests, and misdemeanor (vs. felony) instant case arraignment charge.

Does the COMPAS contribute any useful information beyond a static risk score in the prediction of re-arrest? Table 3.7, Model 1 shows that the COMPAS General Recidivism score was a near-significant (p < .10) predictor of re-arrest at two years after statistically controlling for static risk based on our ad hoc scale. That it emerged as a predictor in the regression analysis suggests that this COMPAS index contains useful information not captured by a score based solely on static factors drawn from non-interview records. Had the COMPAS General Recidivism score not contained any information on criminogenic risk that was not already accounted for in the actuarial risk score, it would not have been flagged as statistically significant (or very nearly so) in this multivariate analysis.

Table 3.7. Predicting 24-Month Re-Arrest Using COMPAS and Actuarial Risk Scores

Predictor	Model 1	Model 2
Number (%) Re-Arrested	102 (43%)	
Summary Risk Scores		
Actuarial Risk	1.43**	1.49**
COMPAS General Recidivism	1.13+	
COMPAS Domain Scores		
Criminal Involvement		1.00
History of Violence		1.11
Criminal Associates		1.05
Substance Abuse		0.98
Criminal Personality		0.98
Cognitive Behavioral		0.84
Family Criminality		1.06
Socialization Failure		1.25**
Vocational/Education		0.96
Social Environment		1.07
Social Adjustment Problems		1.00

Note: + p < .10. * p < .05. ** p < .01.

Note: Odds ratios presented.

The second model presented in Table 3.7 shows that, of the 11 COMPAS domain scores included in the model, only the socialization failure domain improved the model's ability to predict re-arrest beyond actuarial risk (illustrated by a *p*-value of < .01). Again, this domain includes the static factors of parents' criminality, as well as participants' own early delinquency and problems in school. While these findings suggest that an actuarial risk score computed from administrative records alone may be insufficient for predicting risk in such

populations, the results of Model 2 further suggest that it is static factors that most efficiently predict re-arrest (i.e., the static factor tool contains fewer item and produces a lower error rate when compared with the COMPAS assessment). Particularly in light of both funding and time constraints in many court settings, these findings may suggest future directions for developing alternative, abbreviated risk assessment tools.

Chapter 4
Conclusion and Implications

The present study sought to determine whether a widely used risk and needs assessment tool, the COMPAS, performs well in a court-involved population who suffer from serious mental illness. Results indicate that the COMPAS is a good risk assessment instrument by conventional standards: It significantly predicted four re-arrest outcomes and demonstrated area under the curve statistics (~ .70) comparable to those reported by other investigators studying non-mental health court populations (Brennan et al. 2009; Herrschaft 2015; Lansing 2012). The low-risk category was significantly less likely than the others to be re-arrested, but medium- and high-risk groups were not statistically different in the current sample. This is somewhat discrepant from prior research on the COMPAS that has found larger distinctions between medium- and high-risk respondents. This pattern of results might reflect the fact that our sample was generally low-risk according to the COMPAS General Recidivism scale *as it is currently scored*. Had there been a greater proportion of high-risk participants, we might have detected an increased rate of re-arrest over those classified medium-risk.[4] The potential relationship of the COMPAS risk distribution to mental health status or eligibility for an alternative to incarceration is an important topic for future research, particularly given that our sample was re-arrested at a non-negligible rate of 40% over two years.

Our sample displayed a variety of risks and needs. Half or more scored on the high end of the substance abuse, criminal personality, and criminal thinking domain scales—and nearly as many on several other COMPAS domains. This is consistent with prior research suggesting that the propensity to re-arrest among offenders with serious mental illness can be traced to their elevated levels of criminogenic needs, and not to the presence or specific form of mental illness itself (e.g., Morgan et al. 2010; Skeem et al. 2014). The COMPAS scores reflecting the criminogenic need domains of substance abuse, criminal personality,

---

4 The mean General Recidivism and Violent Recidivism Risk scores in our sample were 3.74 and 3.13, respectively (on a 10-point scale). By comparison, the mean scores in Zhang et al.'s (2014) sample of parolees were much higher: 6.16 (general) and 6.31 (violent).

vocational/education, and cognitive behavioral were correlated with two-year re-arrest, though not as strongly as the scores reflecting static factors.

Our multivariate analyses revealed that the most robust predictor among the COMPAS domain scores was socialization failure, which remained statistically significant beyond a powerful static risk score drawn from administrative records and computed especially for the present sample. This score, which was computed from five variables representing purely static factors—age, criminal history, and instant case characteristics—out-performed the COMPAS in predicting re-arrest (though it had the advantage of being computed from and tested on participants from the same sites). Yet, socialization failure appeared to tap into a set of static criminogenic factors not reflected in a purely actuarial estimate of risk. Specifically, this COMPAS score identifies those who experienced a set of risk-enhancing influences stemming from family and school problems. We note, however, that while these developmental factors are certainly capable of driving criminogenic risk among mental health court participants, we cannot know whether their mental illness was a cause, a consequence, and/or a correlate of these life history events.

Noteworthy as well are the domain scores *not* found to predict re-arrest: current violence, criminal thinking, social isolation, and residential instability. These presumably criminogenic needs (according to the COMPAS; Brennan et al. 2009) did not function as such in our mental health court sample, though a disproportionate share scored at the high end on all but Residential Instability. One possibility that could not be tested in the present study is that these domain scores were not predictive of re-arrest precisely because features of the mental health court treatment protocol—such as locating stable housing, addressing criminal thinking and social isolation, and engaging face-to-face interactions with the judge—were successful in mitigating their criminogenic impact. In any event, our findings suggest that in a mental health court setting these domains may be useful in informing treatment planning and case management.

Implications

Our results lead us to conclude that the COMPAS functions adequately as a predictor of future criminal justice involvement. Worth considering, however, is a possible recalibration of the norms for identifying low-, medium-, and high-risk offenders with a serious mental illness. A related possibility worthy of investigation is the development of a shorter version of the COMPAS for the purpose of risk prediction that includes only those domain scores

directly linked to re-arrest—which in our sample represented the static factors of history of violence and socialization failure (e.g., early school problems, delinquency). Research on these questions would clearly call for larger replication samples and a prospective design involving multiple COMPAS tests over time.

Nonetheless, the general risk categories of the COMPAS appear to provide a basis for the development of service plans by flagging participants' needs and presenting conditions, regardless of the nature of their link to re-arrest. Table 3.5 suggests that, for example, those domain scores correlated with re-arrest—Criminal Associates, Substance Abuse, Criminal Personality, Cognitive Behavioral, and Vocation/Education—support the use of evidence-based interventions (e.g., Cognitive-Behavioral Therapy) targeted toward these needs.

This is not to minimize the importance of the mental health treatment component fundamental to the mental health court model. While the literature has shown that serious mental illness does not appear to independently predict criminal behavior, it might nonetheless increase risk in subtle and indirect ways, for example by magnifying the number, level, or impact of other risk factors (Reich et al. 2015; Skeem et al. 2011). Moreover, untreated symptoms might restrict a participant's ability to benefit from treatments, such as cognitive-behavioral therapy, aimed at reducing risk (Lamb & Weinberger 2013; Rotter & Carr 2013). Integrating psychiatric care into the treatment mandate is in line with the Responsivity Principle's dictum that evidence-based treatments should be matched to the person's presenting conditions—in a mental health court setting, the most salient of which include psychiatric diagnosis and symptoms. Indeed, emerging evidence suggests that mental health treatment stabilizes offenders' symptoms and improves their behavioral functioning and access to mental health services (Comartin et al. 2015; Manchak et al. 2014; Martin et al. 2012; Morgan et al. 2012). Coordinating psychiatric and case management activity would help to realize the full potential of the mental health court as a collaborative, therapeutic, problem-solving approach to criminal justice.

References

Baillergeon, Jacques, Ingrid A. Binswanger, Joseph V. Penn, Brie A. Williams, and Owen J. Murray (2009). "Psychiatric Disorders and Repeat Offenders: The Revolving Prison Door." *American Journal of Psychiatry* 166 (1):103 – 09.

Bonta, James, Moira Law, and Karl Hanson. 1998. "The Prediction of Violent Recidivism Among Mentally Disordered Offenders: A Meta-Analysis." *Psychological Bulletin* 123(2):123 – 42.

Brennan, Tim, William Dieterich, and Beate Ehret. 2009. "Evaluating the Predictive Validity of the COMPAS Risk and Needs Assessment System." *Criminal Justice and Behavior* 36(1): 21 – 40. doi: 10.1177/0093854808326545

Burns, Padraic J., Virginia Aldigé Hiday, and Bradley Ray. 2013. "Effectiveness 2 Years Postexit of a Recently Established Mental Health Court." *American Behavioral Scientist* 57:189 – 208. doi: 10.1177/0002764212465416

Castellano, Ursula, and Leon Anderson. 2013. "Mental Health Courts in America: Promises and Challenges." *American Behavioral Scientist* 57(2):163 – 73. doi: 10.1177/0002764212465616

Caudy, Michael S., Joseph M. Durso, and Faye S. Taxman. 2013. "How Well Do Dynamic Needs Predict Recidivism? Implications for Risk Assessment and Risk Reduction." *Journal of Criminal Justice* 41:458 – 66. doi: 10.1016/j.crimjus.2013.08.004

Comartin, Erin, Sheryl Pimlott Kubiak, Bradley Ray, Elizabeth Tillander, and Julie Hanna. 2015. "Short- and Long-Term Outcomes of Mental Health Court Participants by Psychiatric Diagnosis." *Psychiatric Services* 66(9):923 – 29.

Council of State Governments. 2002. *Criminal Justice/Mental Health Consensus Project*. New York: Council of State Governments. Available at: https://csgjusticecenter.org/wp-content/uploads/2013/03/consensus-project-full-report.pdf

Edgely, Michelle. 2014. "Why Do Mental Health Courts Work? A Confluence of Treatment, Support & Adroit Judicial Supervision." *International Journal of Law and Psychiatry* 37(3):572 – 80. doi: 10.1016/j.ijlp.2014.02.031

Fass, Tracy L., Kirk Heilbrun, David DeMatteo, D., and Ralph Fretz. 2008. "The LSI-R and the COMPAS: Validation Data on Two Risk-Needs Tools." *Criminal Justice and Behavior* 35(9):1095 – 108. doi: 10.1177/009385480824097

Fiduccia, Chelsea, and Richard Rogers. 2012. "Final-Stage Diversion: A Safety Net for Offenders With Mental Disorders." *Criminal Justice and Behavior* 39(4):571 – 83. doi: 10.1177/0093854811432527

Gutierrez, Leticia, & Guy Bourgon. 2009. *Drug Treatment Courts: A Quantitative Review of Study and Treatment Quality*. Ottawa, ON: Public Safety Canada.

Hahn, Josephine. 2015. New York State Mental Health Courts Policy Study. Presented at the Center for Court Innovation, December, New York, NY.

Herrschaft, Bryn A. 2015. Evaluating the Reliability and Validity of the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) Tool: Implications for Community Corrections Policy. Presented at the Center for Court Innovation, January, New York, NY.

Hughes, Shannon, and Terry Peak. 2013. "Evaluating Mental Health Courts as an Ideal Mental Health Innovation." *Best Practices in Mental Health* 8(2):20 – 37.

Lamb, H. Richard, and Linda E. Weinberger. 2013. "Some Perspectives on Criminalization." *Journal of the American Academy of Psychiatry and Law* 41(2):287 – 93.

Lansing, Sharon. 2012, September. *New York State COMPAS-Probation Risk and Need Assessment Study: Examining the Recidivism Scale's Effectiveness and Predictive Accuracy.* Criminal Justice Research Report submitted to the New York State Division of Criminal Justice Services.

Lurigio, Arthur J. 2011. "People With Serious Mental Illness in the Criminal Justice System: Causes, Consequences, and Correctives." *The Prison Journal* 91(3):66S – 86S.

Lurigio, Arthur J. 2012. "Responding to the Needs of People With Mental Illness in the Criminal Justice System: An Area Ripe for Research and Community Partnerships." *Journal of Crime and Criminal Justice* 35(1):1-12.

Mamalian, Cynthia A. 2011, March. *State of the Science in Pretrial Assessment.* Washington, DC: Bureau of Justice Assistance, Pretrial Justice Institute.

Manchak, Sarah M., Jennifer L. Skeem, Patrick J. Kennealy, and Jennifer Eno Louden. 2014. "High-Fidelity Specialty Mental Health Probation Improves Officer Practices, Treatment Access, and Rule Compliance." *Law and Human Behavior* 38:450 – 61. doi: 10.1037/lhb0000076

Martin, Michael S., Shannon K. Dorken, Ashley D. Wamboldt, and Sarah E. Wootten. 2012. "Stopping the Revolving Door: A Meta-Analysis on the Effectiveness of Interventions for Criminally Involved Individuals With Major Mental Disorders." *Law and Human Behavior* 36(1):1 – 12. doi: 10.1037/h0093963

McFall, Richard M., and Teresa A. Treat. 1999. "Quantifying the Information Value of Clinical Assessments With Signal Detection Theory." *Annual Review of Psychology* 50:215 – 241.

McNiel, Dale E., Renee L. Binder, and Jo C. Robinson. 2014. "Incarceration Associated With Homelessness, Mental Disorder, and Co-Occurring Substance Abuse." *Psychiatric Services* 56(7):840-46.

Moore, Marlee E., and Virgina Aldige Hiday. 2006. "Mental Health Court Outcomes: A Comparison of Re-Arrest and Re-Arrest Severity Between Mental Health and Traditional Court Participants." *Law and Human Behavior* 30:659 – 74. doi 10.1007/s10979-006-9061-9

Morgan, Robert D., William H. Fisher, Naihua Duan, Jon T. Mandracchia, and Danielle Murray. 2010. "Prevalence of Criminal Thinking Among State Prison Inmates With Serious Mental Illness." *Law and Human Behavior* 34(4):324 – 36. doi: 10.1007/s10979-009-9182-z

Morgan, Robert D., David B. Flora, Daryl G. Kroner, Jeremy F. Mills, Femina Varghese, and Jarrod S. Steffan. 2012. "Treating Offenders With Mental Illness: A Research Synthesis." *Law and Human Behavior* 36(1):37 – 50. doi: 10.1037/h0093964

Northpointe, Inc. 2011. *Practitioner Guide to COMPAS (August 17, 2012).* Traverse City, MI: Northpointe Institute for Public Management, Inc.

Northpointe Institute for Public Management. 2009. *Measurement & Treatment Implications of COMPAS Core Scales.* Traverse City, MI: Northpointe Institute for Public Management, Inc.

Peterson, Jillian K., Jennifer Skeem, Patrick Kennealy, Beth Bray, and Andraa Zvonkovic. 2014. "How Often and How Consistently Do Symptoms Directly Precede Criminal Behavior Among Offenders With Mental Illness?" *Law and Human Behavior* 38(5):439 – 49. doi: 10.1037/lhb0000075

Reich, Warren A., Sarah Picard-Fritsche, Lenore Cerniglia, and Josephine W. Hahn. 2015. "Predictors of Mental Health Court Program Compliance and Re-Arrest in Brooklyn, New York." *Journal of Offender Rehabilitation* 54(6):391 – 405. doi: 10.1080/10509674.2015.1055035

Rezansoff, Stefanie N., Akm Moniruzzaman, Carmen Gress, and Julian M. Somers. 2013. "Psychiatric Diagnoses and Multiyear Criminal Recidivism in a Canadian Provincial Offender Population." *Psychology, Pubic Policy, and Law* 19(4):443 – 53. doi: 10.1037/a0033907

Rossman, Shelli B., Janeen Buck Willison, Kamala Mallik-Kane, KiDeuk Kim, Sara Debus-Sherrill, and P. Mitchell Downey. 2012, February. *Criminal Justice Interventions for*

Offenders With Mental Illness: Evaluation of Mental Health Courts in Bronx and Brooklyn, New York. Final Report. Retrieved July 15, 2013 from http://www.urban.org/publications/412603.html.

Rotter, Merrill, and W. Amory Carr. 2013, October. *Reducing Criminal Recidivism for Justice-Involved Persons with Mental Illness: Risk/Needs/Responsivity and Cognitive-Behavioral Intervention.* Rockville, MD: SAHMSA's GAINS Center for Behavioral Health and Justice Transformation.

Sarteschi, Christine M., Michael G. Vaughan, and Kevin Kim. 2011. "Assessing the Effectiveness of Mental Health Courts: A Quantitative Review." *Journal of Criminal Justice* 39:12 – 20. doi: 10.1016/j.jcrimjus.2010.11.003

Skeem, Jennifer L., Sarah Manchak, and Jillian K. Peterson. 2011. "Correctional Policy for Offenders With Mental Illness: Creating a New Paradigm for Recidivism Reduction." *Law & Human Behavior* 35:110 – 26. doi: 10.1007/s10979-010-9223-7

Skeem, Jennifer L., and John Monahan. 2011. "Current Directions in Violence Risk Assessment." *Current Directions in Psychological Science* 20(1): 38 – 42. doi: 10.1177/0963721410397271

Skeem, Jennifer L., Eliza Winter, Patrick J. Kennealy, Jennifer Eno Louden, and Joseph R. Tatar II. 2014. "Offenders With Mental Illness Have Criminogenic Needs, Too: Toward Recidivism Reduction." *Law and Human Behavior* 38(2):212 – 24. doi: 10.1037/lhb0000054

Steadman, Henry J., Allison Redlich, Lisa Callahan, Pamela Clark Robbins, and Roumen Vesselinov. 2011. "Effect of Mental Health Courts on Arrests and Jail Days: A Multisite Study." *Archives of General Psychiatry* 68(2): 167 – 72.

Wilson, Amy Blank, Jeffrey Draine, Trevor Hadley, Steve Metraux, and Arthur Evans. 2010. Examining the Impact of Mental Illness and Substance Use on Recidivism in a County Jail." *International Journal of Law and Psychiatry* 34:264 – 68. doi:10.1016/j.ijlp.2011.07.004

Zhang, Sheldon X., Robert E. L. Roberts, and David Farabee. 2014. "An Analysis of Prisoner Reentry and Parole Risk Using COMPAS and Traditional Criminal History Measures." *Crime & Delinquency* 60:167 – 92. doi: 10.1177/0011128711426544

Appendix:
COMPAS Scales and Domains

Scale	Description	Sample Content
Summary Scales		
General Recidivism Risk	Criminal history, criminal associates, drug involvement, juvenile delinquency	Criminal history; criminal associates; drug involvement; juvenile delinquency
Violent Recidivism	History of juvenile violence, current violence, probation/parole failure, criminal associates	Age; age at first arrest; history of violence; history of noncompliance; vocational/education
Domain Scales		
Cognitive Behavioral	Higher-order scale	Crim. associates; crim. thinking; socialization failure; social adjustment problems scales
Criminal Associates	Association with peers who engage in illegal activity	Friends/acquaintances spent time in jail; ever been a gang member
Criminal Involvement	Extent of contact with the criminal justice system	# of times sentenced to jail for 30+ days; # of times sentenced to probation
Criminal Personality	Impulsivity, no guilt, violent temper, selfishness	I am seen by others as cold and unfeeling; I have a short temper and can get angry quickly
Criminal Thinking	Cognitions that justify and support criminal behavior	Some people must be treated roughly… to send a message; the law doesn't help average people
Current Violence	Degree of violence in the present offense	Family violence; violent felony offense
Family Criminality	Degree to which family members have been involved in criminal activity, drugs, or alcohol abuse	Brothers or sisters ever arrested? Raised by both natural parents?
Financial	Degree to which person experiences poverty and financial problems	Trouble paying bills? Worry about financial survival?
History of Violence	Seriousness of violence in person's criminal history	Prior juvenile violent felony arrests; prior family violence arrests
Leisure and Recreation	Boredom, restlessness, inability to maintain interest	How often did you feel bored? How often do you feel you have nothing to do?
Residential Instability	Degree to which person has long-term ties to the community	# of moves in the last 12 months; live alone
Social Adjustment Problems	Higher-order scale	Ever fail/repeat a grade level; ever fired from a job
Social Environment	Crime, disorder, victimization potential of person's neighborhood	Is there much crime in your neighborhood? Is it easy to get drugs in your neighborhood?
Social Isolation	Degree to which the person has a supportive social network	I feel lonely; I often feel left out of things
Socialization Failure	Higher-order scale: Family drug and criminal history, school problems, early delinquency	High school graduate; # of juvenile felony arrests
Substance Abuse	General indicator of substance abuse problems	Using drugs when arrested for current offense; currently in SA treatment
Vocational/Education	Success or failure in work and education	Typical grades in high school; employment