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# The Moderating Relationship of Comorbid Psychopathology on Treatment Outcome for Young Adult Offenders in Drug Court

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## Abstract

**Title:** The moderating relationship of comorbid psychopathology on treatment outcome for young adult offenders in drug court.

**Background:** The drug court system is an alternative to incarceration that provides offenders with non-violent, substance motivated crimes with an opportunity to dismiss their charges and undergo a rigorous substance abuse treatment program. It is unknown whether drug court is effective for young adult clients and the role of co-occurring psychopathology within this context.

**Methods:** This study evaluated the overall effectiveness of a drug court system applied to young adult offenders ages 18-26, and additionally explored the moderating relationship of psychiatric symptoms on treatment outcome. Seventy-four clients were assessed at baseline and at 6-month follow-up.

**Findings:** Participants reported reductions in substance use ( $M=35.51$ ,  $SD=29.92$ ;  $M=7.79$ ,  $SD=17.83$ ;  $t(71)=7.00$ ,  $p<0.001$ ) and mental health symptoms ( $M=48.26$ ,  $SD=36.49$ ;  $M=36.40$ ,  $SD=37.99$ ;  $t(71)=2.05$ ,  $p<0.05$ ) at follow-up. Additionally, moderators of outcome were found based on internalizing and externalizing mental health symptoms.

**Conclusions:** Drug court may be an effective alternative to incarceration for young adults and may benefit higher severity clients in particular.

**Keywords:** Substance abuse; internalizing disorder; mental health

incarcerated-approximately 716 people per 100,000 [1,2]. Contrary to expectations, incarceration has been consistently demonstrated as widely ineffective for preventing recidivism [3-5]. In particular, offenders with substance abuse issues have become a growing concern within the criminal justice system. Mandatory minimums on drug offenses, combined with the rigorous conviction of non-violent drug offenders, have fueled an extraordinary amount of incarcerated offenders with addictions [6]; offenders struggling with addictions are about 82% more likely to recidivate than non-addicted offenders upon release [3]. Without adequate substance abuse and mental health services, offenders with addictions are at a higher risk of recidivism upon release into the community.

Adult drug court is a problem-solving court created to divert offenders with substance abuse issues from incarceration by focusing predominately on rehabilitation. The drug court system is a collaborative effort between court personnel (e.g. judges, drug court specialists, state attorneys, and public defenders), treatment providers, independent evaluators, and offenders to eliminate addictions. Eligible drug offenders are given the option to participate in drug court; upon agreement, clients are mandated to complete a rigorous and intensive treatment regimen combined with ongoing random drug testing and scheduled court appearances. Contingent upon their completion of treatment, the drug court will dismiss their charges and oftentimes expunge their criminal record. If an offender fails to complete treatment, commits an additional crime or consistently fails drug tests, the individual is convicted and sentenced thereafter.

While most research literature suggests the effectiveness of drug court [7-10], there is a scarce understanding on whether these findings translate to young adult offenders whose experiences are notably different given their developmental context [11]. Additionally, existing research has yet to identify specific characteristics of individuals that are more or less likely to benefit from drug court. Identifying potential moderators of treatment for this population has large implications for judicial personnel, clinicians, and policy makers. In particular, co-occurring psychopathology is widely prevalent among

## Introduction

Since its inception, the American criminal justice system has focused on punishing offenders to deter and prevent criminal activity. In 2013, about 2 million American citizens were

individuals with substance use disorders (up to 65%) [12]. Clients with co-occurring psychopathology may respond more positively to comprehensive treatment models that factor in underlying disorders.

### Current study

The present study aims to resolve several disparities in existing literature by evaluating the effectiveness of a young adult drug court program in Florida and identifying potential moderators of treatment outcome based on co-occurring psychopathology. The intervention was a combined mental health and substance abuse treatment program housed within an adult drug court that targets non-violent young adult offenders (ages 18-26) with crimes associated with illegal substances.

This study had several objectives and components including to: 1) evaluate the initial six-month effectiveness of a young adult drug court model by measuring clients' overall substance use and mental health symptomatology, and 2) determine if baseline psychopathology moderated the program's effectiveness on outcome. All protocol and procedures were approved by an IRB at the University of South Florida, and informed consent was obtained from each participant before any study activities were initiated.

## Method

### Participants

Inclusion criteria for participating in the program include male and female young adult offenders with drug-motivated non-violent felony charges. Sex offenders and violent/noncompliant offenders are excluded from participating in the court. The present study investigated client progress over a six-month period of time since beginning substance abuse treatment. Clients were mandated to undergo intensive treatment in three stages: (1) three months at three times a week, then (2) three months at two times a week, and finally (3) three to six months of aftercare with individual therapy, support groups, and drug tests. Of the participants enrolled in the program, 98 completed baseline assessments, and 74 completed both baseline and six-month follow-up measures at the time of analysis. As can be seen in **Table 1**, about 64% were female, the average age was about 22.5 years old, and approximately 84% were Caucasians. More than half (58%) did not complete high school, with 42% completing high school or GED. 85% of the sample were single.

Those that completed both baseline and follow-up measures did not differ in most demographic variables (all  $p$ 's > 0.05), however those that completed treatment were more likely to have completed high school ( $p < 0.05$ ). Those who completed follow-up assessments endorsed more symptoms of psychopathology at baseline than those who did not ( $p < 0.01$ ). In contrast, participants who did not complete follow-up measures had higher reported cocaine use ( $p < 0.001$ ).

**Table 1:** Demographics characteristics (n=98).

Characteristic	n	% or Mean (SD)
<b>Gender</b>		
Male	35	36.6
Female	63	64.3
Age (years)	98	22.5 (2.21)
<b>Race/Ethnicity</b>		
Caucasian	82	83.7
African-American	1	2.9
Hispanic/Latino	1	1
Mixed	12	12.2
Other	1	1
<b>Education (years)</b>		
Less than high school diploma	57	58.2
High school diploma/GED	41	41.8
Associate's degree	3	2.5
Bachelor's degree	1	1
Vocational/trade certificate	14	14.3
<b>Sexual Orientation</b>		
Heterosexual	88	85.4
Homosexual, gay or lesbian	4	3.8
Bisexual	4	3.8
Non-sexual or asexual	2	1.9
<b>Marital status</b>		
Married	1	1
Living with someone as married	1	1
Married but living apart	5	4.8
Divorced	1	1
Legally separated	2	1.9
Single	88	85.4
Pregnant	4	3.9
Note: Percentages represent valid % due to limited missing data.		

### Measures

This study conducted an evaluation using data obtained from the measures described below. Data were collected from each participant at baseline upon entering drug court treatment and subsequently six months later.

**The global appraisal of individual needs-Q3:** MI assessment (GAIN-Q3) The GAIN assessment is a brief comprehensive evaluation tool administered via a 20-40-minute structured clinical interview by a trained clinical research assistant [13]. The interview is divided into several components assessing school problems, work problems, physical health, sources of stress, risk behaviours for infectious diseases, mental health, substance use,

and crime and violence. These analyses focused on substance use measured by the GAIN-Q3. Cronbach's alpha internal consistency reliability scores were fair,  $\alpha=0.66$  at baseline and  $\alpha=0.65$  at follow-up.

**Brief symptom inventory (BSI):** The BSI is a 53 item self-report measure that assesses overall mental health functioning [14]. The BSI is divided into nine subscales that measure symptoms of (1) somatization, (2) obsessive compulsion, (3) interpersonal sensitivity, (4) depression, (5) anxiety, (6) hostility, (7) phobic anxiety, (8) paranoid ideation, and (9) psychoticism. Internal consistency reliability scores were very strong, Cronbach's  $\alpha=0.96$  at baseline and follow-up.

## Analyses

Descriptive statistics were used to characterize the sample. To answer questions associated with treatment effectiveness paired samples t-tests were conducted on several variables associated with substance use and mental health symptomatology using SPSS 22 software. To investigate moderators of treatment outcome via presenting psychopathology, participants were categorized into two groups: lower severity (by reporting internalizing disorder symptoms for less than 45 out of 90 days at baseline) and higher severity (by reporting internalizing disorder symptoms for 45 days or more out of 90 days at baseline). Internalizing disorder symptoms included depressive symptoms (i.e., low mood, hopelessness), insomnia, anxiety (i.e., nervousness, panic symptoms), post-traumatic stress symptoms, suicidality, and auditory/visual hallucinations.

Symptoms included in analyses were further characterized as impairing and distressing; impairment and distress were respectively defined as symptoms that prevent the client from fulfilling daily responsibilities, and symptoms that create a significant subjective disturbance. Second, a series of between subjects repeated measures analyses of variance (ANOVAs) were performed to determine if various outcomes were moderated as reflected by significant group by time interactions; third, when significant predictors were identified, additional paired samples t-tests were used as follow-up tests to help further understand the nature of the moderating relationships.

## Results

### Substance use

Clients reported the total number of days they used any alcohol or drugs within the last 90 days at baseline and 6-month follow-up. Clients reported reductions in overall substance use ( $M=35.51$ ,  $SD=29.92$ ;  $M=7.79$ ,  $SD=17.83$ ;  $t(71)=7.00$ ,  $p<0.001$ ). Similarly, clients reported decreases in alcohol use ( $M=14.67$ ,  $SD=21.93$ ;  $M=1.96$ ,  $SD=7.83$ ;  $t(72)=4.64$ ,  $p<0.001$ ), heroin, methadone, and opioid use ( $M=13.51$ ,  $SD=21.67$ ;  $M=3.30$ ,  $SD=11.68$ ;  $t(72)=3.78$ ,  $p<0.001$ ), and a variable representing other drug use ( $M=7.19$ ,  $SD=17.41$ ;  $M=1.27$ ,  $SD=7.11$ ;  $t(72)=2.85$ ,  $p<0.01$ ) (**Table 2**).

**Table 2:** Client substance use outcomes within the past 90 Days at baseline and 6 months after program enrollment (n=74).

	Participants				
	Baseline		6 months after program enrollment		Significance
	n	M (SD)	n	M (SD)	
Overall Substance Use***	72	35.51 (29.92)	72	7.79 (17.83)	$t=7.00$ (df=71) $p<.001$
Alcohol***	73	14.67 (21.93)	73	1.96 (7.83)	$t=4.64$ (df=72) $p<.001$
Heroin, Methadone, or Opioid***	73	13.51 (21.67)	72	3.30 (11.68)	$t=3.78$ (df=72) $p<.001$
Other drug use**	73	7.19 (17.41)	73	1.27 (7.11)	$t=2.85$ (df=72) $p<.01$
Cocaine/Crack	72	3.65 (11.56)	72	1.28 (8.42)	$t=1.45$ (df=71) $p=.153$
* $p<0.05$ ; ** $p<0.01$ ; *** $p<0.001$					

### Mental health symptomatology

In addition to reductions in substance use, clients reported overall reductions in internalizing disorder symptoms ( $M=48.26$ ,  $SD=36.49$ ;  $M=36.40$ ,  $SD=37.99$ ;  $t(71)=2.05$ ,  $p<0.05$ ) within 90 days of their assessment. Participants also reported decreases in symptoms on the BSI assessment's global severity index ( $M=0.59$ ,  $SD=0.71$ ;  $M=0.44$ ,  $SD=0.56$ ;  $t(73)=2.45$ ,  $p<0.01$ ).

Additional BSI subscale reductions were found in somatization ( $M=0.52$ ,  $SD=0.75$ ;  $M=0.29$ ,  $SD=0.44$ ;  $t(73)=3.55$ ,  $p<0.001$ ), anxiety ( $M=0.62$ ,  $SD=0.84$ ;  $M=0.42$ ,  $SD=0.65$ ;  $t(73)=2.47$ ,  $p<0.01$ ), psychoticism ( $M=0.52$ ,  $SD=0.73$ ;  $M=0.36$ ,  $SD=0.58$ ;  $t(73)=2.25$ ,  $p<0.05$ ), as well as phobic anxiety ( $M=0.35$ ,  $SD=0.69$ ;  $M=0.22$ ,  $SD=0.49$ ;  $t(73)=1.98$ ,  $p=0.05$ ) (**Table 3**).

**Table 3:** Client mental health outcomes at baseline and 6 months after program enrollment (n=74).

	Participants					Significance
	Baseline		6 months after program enrollment			
	n	M (SD)	n	M (SD)		
Internalizing Disorder Symptoms <sup>1*</sup>	72	48.26 (36.50)	72	36.40 (37.99)	t=2.05 (df=71) p=0.04	
Brief Symptom Inventory Somatization <sup>***</sup>	74	0.52 (0.75)	74	29 (0.44)	t= 3.55 (df=73) p=0.001	
Anxiety <sup>**</sup>	74	0.62 (0.84)	74	0.42 (0.65)	t=2.47 (df=73) p=0.01	
Phobic Anxiety <sup>*</sup>	74	0.35 (0.69)	74	0.22 (0.49)	t=1.98 (df=73) p=0.05	
Psychoticism <sup>*</sup>	74	0.52 (0.73)	74	0.36 (0.58)	t=2.25 (df=73) p=0.02	
Global Severity Index <sup>**</sup>	74	0.59 (0.71)	74	0.44 (0.56)	t=2.45 (df=73) p=0.01	

Symptoms were assessed within the last 90 days of assessment. <sup>\*</sup>p<0.05; <sup>\*\*</sup>p<0.01; <sup>\*\*\*</sup>p<0.001

**Table 4:** Client predictors of mental health outcomes at baseline and 6 months after program enrollment (n=74).

	Low Internalizing Disorder Symptoms		High Internalizing Disorder Symptoms		Between Subjects Repeated Measures ANOVAs		Follow-up paired samples t-tests	
	Baseline	6 Months	Baseline	6 Months	time	Time x group	Low Internal	High Internal
	M (SD)	M (SD)	M (SD)	M (SD)	F-value (p-value)	F-value (p-value)	t-value (p-value)	t-value (p-value)
Brief Symptom Inventory Global Severity Index	0.2 (0.28)	0.35 (0.44)	0.91 (0.79)	0.5 (0.63)	5.15 (0.026)	24.96 (0.000)	-2.68 (0.012)	4.56 (0.000)
Somatization	0.18 (0.35)	0.22 (0.36)	0.78 (0.87)	0.34 (0.49)	11.87 (0.001)	16.92 (0.000)	-1.00 (0.325)	4.42 (0.000)
Obsessive-Compulsive	0.21 (0.38)	0.47 (0.6)	1.28 (1.05)	0.76 (0.99)	1.99 (0.163)	17.40 (0.000)	-3.18 (0.003)	3.38 (0.002)
Interpersonal Sensitivity	0.15 (0.3)	0.32 (0.53)	0.9 (1.08)	0.49 (0.79)	1.96 (0.17)	11.64 (0.001)	-2.01 (0.053)	3.00 (0.005)
Depression	0.19 (0.33)	0.36 (0.56)	0.96 (0.97)	0.59 (0.89)	1.48 (0.228)	11.04 (0.001)	-1.83 (0.077)	2.96 (0.005)
Anxiety	0.24 (0.40)	0.35 (0.53)	0.92 (0.98)	0.48 (0.74)	5.10 (0.027)	14.25 (0.000)	-1.81 (0.08)	3.63 (0.001)
Hostility	0.21 (0.36)	0.50 (0.78)	0.68 (0.75)	0.37 (0.50)	0.030 (0.86)	16.13 (0.000)	-2.32 (0.027)	3.48 (0.001)
Phobic Anxiety	0.04 (0.13)	0.12 (0.36)	0.60 (0.85)	0.31 (0.55)	3.06 (0.085)	8.60 (0.005)	-1.48 (0.148)	2.8 (0.008)
Paranoid Ideation	0.22 (0.36)	0.41 (0.52)	0.94 (0.91)	0.54 (0.74)	1.69 (0.199)	14.62 (0.000)	-2.71 (0.011)	3.14 (0.003)
Psychoticism	0.15 (0.37)	0.27 (0.49)	0.82 (0.81)	0.44 (0.64)	4.07 (0.047)	14.39 (0.000)	-1.45 (0.157)	3.88 (0.000)
Overall Substance Use	32.48 (30.26)	7.33 (18.63)	38.08 (29.79)	8.18 (17.37)	47.54 (0.000)	0.35 (0.554)		
Alcohol	14.55 (21.35)	2.42 (10.44)	14.77 (22.67)	1.58 (4.82)	20.85 (0.000)	0.04 (0.846)		
Crack/Cocaine	5.30 (15.75)	0.48 (2.61)	2.26 (6.03)	1.95 (11.21)	2.45 (0.122)	1.90 (0.173)		
Heroin, Methadone or Opioid	17.03 (25.29)	3.15 (11.20)	10.60 (17.96)	3.43 (12.21)	15.24 (0.000)	1.55 (0.218)		
Other Drug Use	4.03 (13.25)	1.94 (10.28)	9.8 (20.00)	0.72 (2.44)	7.37 (0.008)	2.88 (0.094)		

Analyses were then conducted on mental health symptomatology to identify moderators of treatment outcome. As seen in **Table 4**, between subjects repeated measures ANOVAs suggested that clients with higher levels of internalizing disorder complaints reported overall more success at reducing psychopathology during substance abuse treatment determined by the BSI. These results were significant on all nine subscales of the measure. Follow-up paired samples t-tests demonstrated that clients with low internalizing disorder symptoms reported statistically significant increases in psychopathology after six months across five BSI subscales. Similar analyses on substance use did not yield significant results, suggesting that clients are reducing substance use at comparable rates regardless of their baseline level of internalizing disorder symptoms.

## Discussion

This study found that after completing drug court, young adult participants reported reductions in frequency of overall substance use, and internalizing disorder symptoms at six-month follow-up. These findings complement previous literature on drug court effectiveness [7-10].

More unique to this study is the focus on young adult offenders ages 18-26. Whereas a disparity in drug court literature includes an independent examination of the young adult population, this study evaluated young adults exclusively and found significant effects. Specifically, our clients expressed reductions in overall substance use, alcohol, heroin, opioid, methadone, and other drug use.

This study investigated the effect of drug court on mental health symptomatology and found that clients reported reductions on internalizing disorder symptoms from baseline to six-month follow-up. This finding was also reflected at significant levels within subscales of the Brief Symptom Inventory—specifically somatization, anxiety, phobic anxiety, psychoticism, and the global severity index. Additionally, our sample's average score at baseline on the Brief Symptom Inventory's global severity index is 0.59. Compared to adult non-patients, our sample scored at or above 82% of this population, suggesting that our sample presented greater symptoms of psychopathology than a normative sample [14].

The results of this study also suggest potential moderators of treatment outcome dependent upon baseline mental health characteristics. The evidence above suggests that clients with more impairing and distressing internalizing disorder symptoms at baseline were more successful in reducing psychopathology over the course of six months in treatment compared to clients with less severe symptoms. Further, this study found those with less severe symptoms at intake reported greater levels of psychopathology over the course of treatment. These moderation findings may have emerged for several reasons; first, clinicians may recognize a greater need to assist individuals with more severe symptoms at baseline and therefore direct more of their resources to this group of clients. Second, drug courts were designed to serve high risk offenders; according to the criminological construct called the "risk principle," intensive court monitoring would be expected to achieve the greatest

benefits for high-risk offenders with more severe mental health and drug use histories, but may be unnecessary or even contraindicated for low-risk offenders [15,16]. It is possible that participants classified in the low distress group were lower risk individuals who would have been better served in an alternate diversion program with less requirements than a drug court. Consistent with this possibility, Lowenkamp, Latessa, and Hostlinger reviewed several studies investigating the risk principle and found that intensive programs that included a large percentage of low-risk offenders were more likely to have poorer outcomes than those that were populated by a greater proportion of high-risk offenders [17]. It should be noted that while differences between these groups were found in internalizing disorder symptoms, no differences were found in other areas (i.e., substance use, criminal justice involvement).

The limitations of this study warrant mention and should be utilized as a foundation for improving future research on drug courts. Of importance, the results of this study are subject to a certain degree of bias as all responses are based on self-report measures. This is especially important to consider in a context such as drug court where responses may be compromised by external influences. Unfortunately, it was beyond the scope of this study to include results from mandated drug tests, thus to compound this study, future evaluations should include these measures. The results from this study cannot assume causation and can only infer associations due to a lack of control group. Future studies may consider using a waiting-list control group, or a comparison group representing incarcerated drug offenders to compare the effects of drug court to incarceration. These limitations notwithstanding, these findings complement other results in this area of research, and further highlight the importance of comorbid psychopathology in drug courts.

The implications of this study are relevant for drug court professionals, and policy makers. The results of this evaluation strengthen previous research on drug court effectiveness and provide additional findings on young adult offenders and comorbid psychopathology. This research suggests that alternatives to incarceration can be effective for at-risk and underserved populations—especially among substance abusers with drug-motivated criminal histories. Policy makers interested in criminal justice reform may take an interest in the results of this study, particularly in regard to the moderation findings which may reflect the Risk-Needs-Responsivity (RNR) nature of drug court systems.

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