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Exploring the Impact of Technical Violations on Probation Revocations in the Context of Drug Court

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Abstract

Prior research indicates a large number of drug court participants commit technical violations, subsequently increasing the likelihood of revocation. However, there is limited research investigating the potential heterogeneous effects of technical violations on probation revocation in the context of drug court participation as a condition of probation. The current study provides an initial investigation into the relationship between specific categories of technical violations for offenders court-ordered to participate in a drug court. Results indicate that while the total number of violations predicts revocation and jail sanctions, specific violations have varying effects. Specifically, positive drug tests during court participation significantly predicted probation revocation. Regarding jail sanctions, all categories of violations with the exception of failure to pay and "other" violations were predictive of receiving jail time. Policy implications for probation practice are provided.

Keywords Probation · Community corrections · Technical violations · Revocation

Introduction

Substance abuse/use is a well-established risk factor in criminality (Bennett et al. 2008; Franco 2010; Sinha and Easton 1999). A meta-analysis conducted by Bennett et al.

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(2008) determined that the odds of committing a criminal offense were 3–4 times greater for those who used drugs compared to those who did not, holding true across a variety of criminal activity. Substance use is also more prevalent among probationers than the general population, with an estimated 31% of probationers reporting illegal drug use or alcohol dependence in the past year (Feucht and Gfroerer 2011; Lurigio et al. 2003). As such, a large number of probationers are placed on community supervision for drug-related offenses (Kaeble 2018). In response to the increased number of substance-users coming in contact with the community correctional system, drug courts have become a common alternative to traditional correctional sanctions.

It is estimated there are over 3100 adult drug courts operating across the United States (Bureau of Justice Assistance, National Institute of Justice, & Office of Juvenile Justice and Delinquency Prevention, 2018). Generally, prior research has concluded drug court programs are an effective alternative to traditional court processing for substance using offenders (Mitchell et al. 2012; Wilson et al. 2006). While the extant research is largely supportive of the drug court model, evidence exists that a large number of drug court participants violate program rules and fail to complete these programs due to technical violations (Taxman and Bouffard 2005). Thus, further research is needed to examine the effects that technical violations have on probation revocation among probationers ordered to drug court.

The Use of Drug Courts for Substance Using Probationers

Drug courts provide more comprehensive services than traditional court processing, often combining treatment, drug testing, and judicial monitoring (Belenko 1998). Drug courts aim to reduce drug use and subsequent offending through the integration of risk and needs assessments, judicial interventions, monitoring, and supervision, graduated sanctions and incentives, and treatment services (Bureau of Justice Assistance et al. 2018). Prior research has consistently found that drug courts reduce both substance use and recidivism as compared to traditional case processing (Banks and Gottfredson 2004; Gottfredson and Exum 2002; Gottfredson et al. 2003; Peters and Murrin 2000). Cross-site comparisons have shown participation significantly reduces both the incidence and prevalence of rearrest for up to three years following participation (Cissner et al. 2013).

In addition to independent and multi-site comparisons, several meta-analyses have estimated the overall effectiveness of drug courts on recidivism (Shaffer 2011; Wilson et al. 2006), concluding that participants are less likely to re-offend than offenders who are sentenced to traditional correctional sanctions. In a meta-analytic review of 60 drug court evaluations, Shaffer (2011) posited that drug courts on average reduce recidivism by 9% and are most effective when they exclude violent and non-compliant offenders. Mitchell et al. (2012) analyzed 92 independent evaluations of adult drug courts and found that the vast majority of adult drug court participants have lower recidivism rates than comparison groups. The results estimated that the average effect of drug court participation is equivalent to a 12% drop in recidivism and the effects last for up to three years (Mitchell et al. 2012). In sum, there is strong empirical evidence that drug courts are more effective at reducing recidivism when compared to traditional court processing, such as traditional community supervision.

Predicting Drug Court and Treatment Success

The average completion rate for drug courts is 59%, which demonstrates that a significant number of participants fail to complete programs due to technical or new offense violations (Marlowe et al. 2016). As successful participation in drug court is linked to reductions in recidivism, it is important to understand which factors are related to program retention and completion. In an assessment of drug court graduates, Hartley and Phillips (2001) found employment and having a higher level of education predicted successful completion, while minorities and participants whose drug of choice was cocaine were less likely to be successful. A comparison study of rural and urban drug courts reported that marital status, employment, drug use, and criminal activity predicted graduation amongst urban participants, while age and having a juvenile incarceration were predictive of graduation for rural participants (Mateyoke-Scrivner et al. 2004). Most recently, Shannon et al. (2016) found two factors predicted successful completion, being older and receiving outpatient referrals, while being non-white, married, having a lower level of education, psychological/emotional treatment episodes, positive drug tests, receiving incarceration and warrant sanctions, and prior justice involvement predicted failure. There is evidence that spending more time in treatment is crucial to success and that at least 90 days in treatment is necessary to achieve positive results and longer participation in drug court increases the likelihood of success (Rempel and Destefano Depies 2002; Taxman and Bouffard 2005). As failure to complete drug court is linked to an increased likelihood of recidivism, it is also critical to understand the role violations of drug court rules and subsequent sanctions have on participant outcomes.

Violations and Sanctions in Drug Court

One central feature of drug courts is the use of sanctions in response to violations. Drug court sanctions typically are more therapeutic and treatment-oriented than sanctions administered in traditional court settings (Lindquist et al. 2006). Violations in drug court are commonplace, with one estimate that 71% of participants received at least one sanction (Guastaferro and Daigle 2012). The authors found that on average, participants received 4 sanctions and 77% of participants continued in drug court after being sanctioned. While sanctioning practices vary by jurisdiction, drug courts typically administer sanctions in a progressive manner in which lower-magnitude sanctions are administered for early violations followed by higher-magnitude sanctions for continued or more serious violations (Arabia et al. 2008). For example, Arabia et al. (2008) found that participants who absconded or failed to show to judicial status hearings were more likely to receive more stringent sanctions such as jail time, house arrest, and show-cause hearings.

As violations and sanctioning are common practice in drug courts, several studies have examined the relationship between sanctioning and court outcomes. Harrell and Roman (2001) compared a court program utilizing structured sanctions in combination with judicial monitoring and drug testing to a docket without structured sanctions. The authors found that participants assigned to the sanctioning docket were significantly less likely to use illegal drugs prior to

sentencing and recidivate in the year following court participation. In an evaluation of judicial status hearings in drug court, Marlowe et al. (2005) reported that individuals who expected to receive sanctions or incentives based on their behavior while in drug court were more likely to abstain from drug use. However, nearly half of the participants reported using drug or alcohol use and between 10 and 15% resumed criminal activity within one year from court admission. McRee and Drapela (2009) considered the timing and number of sanctions on court completion, concluding that the number of sanctions received in drug court significantly predicted the likelihood of successful completion. Some critics posit that drug court participants remain in the program due to the threat of legal sanctions including jail time. Hepburn and Harvey (2007) investigated this claim finding that the threat of jail sanctions had no effect on the length of time in drug court nor completion. In an examination of the impact of jail sanctions during drug court participation, Brown et al. (2011) found that early sanctioning increased the likelihood of treatment failure, but a later first sanction predicted court retention.

One popular sanctioning model is the Hawaii Opportunity Probation with Enforcement (HOPE) community-supervision strategy. The HOPE model is primarily focused on intensive monitoring and swift and certain sanctions for every violation (Hawken and Kleiman 2009). The initial evaluation of HOPE found that more than half of probationers in the program never violated program rules and participation reduced drug use, recidivism, and subsequent incarceration (Hawken and Kleiman 2009). Although HOPE was found to be an effective program in Hawaii, subsequent evaluations of courts following similar sanctioning models provide mixed results (Hamilton et al. 2016; O'Connell et al. 2016). Although prior research has investigated the impact of sanctioning mechanisms on drug court outcomes, little attention has been given to how technical violations predict the use of jail sanctions during program participation. More research is needed to investigate the relationship between technical violations and the use of jail sanctions during court participation.

Current Study

The current study utilizes data from a post-adjudication felony drug court in a large metropolitan area in the Southwest United States in order to examine the effects of technical violations on probation revocation. Prior research has identified an association between technical violations, sanctions, and revocation but has failed to investigate which types of violations are associated with revocation. The current study adds to the literature by considering the individual effect of specific violations (e.g. failure to pay, failure to report, positive drug tests, etc.) on revocations during court participation. Further, the current study investigates whether specific violations are associated with receiving a jail sanction in drug court. Specifically, the current study aims to answer the following research questions:

RQ1: Does the overall number of technical violations predict revocation?
RQ2: Do specific categories of technical violations predict revocation?
RQ3: Does the overall number of technical violations predict jail sanctions?
RQ4: Do specific categories of technical violations predict jail sanctions?

Methods

Data

The current study relies on secondary drug court data provided by a large Community Supervision and Corrections Department (CSCD) in an urban, southwestern county. Data was obtained from the probation department's electronic case management system for 123 felony drug court participants who were enrolled in the program between October, 2015 to October, 2017, the first two years the program was under the supervision of the probation department. This study serves as a baseline for court evaluation under new oversight and supervision, thus the population size is small, but also provides information about technical violations of probation in the context of a drug court. Prior to October, 2015 the drug court was administered by the county, but oversight was then transferred to the adult probation department in October, 2015. This time period was selected so that participants would have had sufficient time to complete the court program at time of data collection. Sixty-one (61) variables were collected both by computer query extraction and reading individual case notes called "chronologicals" for each offender in the study.

The felony drug court program targets offenders with serious substance abuse issues who have either had previous substance related offense(s) and prior contact with the criminal justice system or who are first-time offenders but display a high level of treatment need. Offenders are referred to the program in one of three ways: (1) as direct placements upon sentencing to probation; (2) currently on probation but have a pending motion to revoke supervision; or (3) have been dismissed from other court ordered programs and need substance abuse treatment. To be eligible for placement in the program offenders must be at least 17 years of age, be on probation with at least 24 months or more remaining on their community sentence for a felony offense originating in the jurisdiction and not be on probation in another county, and reside in the court's jurisdiction. They must not have any prior sex offenses, major mental impairments, or be in a gang. Additionally, offenders must have a substance abuse evaluation and be assessed as chemically dependent. Probationers must not have a persistent/serious physical illness that would prevent participation in drug court requirements (specifically interfering with adequate drug tests and drug use monitoring).

The probation department's case management system includes a vast amount of data in order to provide a complete record of compliance with court-ordered community supervision conditions, as well as information related to education, employment, behavioral issues, social and family history, criminal history, assessment information, court actions, sanctions imposed, and court-ordered treatment programming. Data collected for this study consists of all demographic data and supervision related data, such as the instant offense, level and degree of offense, risk level, types of violations of supervision conditions and frequency of violations, including drug testing results, and sanctions applied in response to non-compliance. Criminal history information was obtained from the state crime records repository and examined for re-arrest either while in the drug court.

Measures

Technical Violations

The primary independent variable of interest in the study is whether a participant committed technical violations during drug court. The number of technical violations was measured as the *total number of violations* each participant had during the drug court program. Approximately 96% of participants ($n = 118$) had at least one program violation and with an average of 12.9 technical violations during the court program (Range = 0–67; $SD = 10.07$). Next, technical violations were categorized into five different categories based on program rules (and violations most commonly committed/observed): failure to pay, failure to report, treatment absences, positive drug tests, and other. *Failure to pay* was measured as the number of months each participant failed to pay either supervision, court fees, and/or court costs. Eighty-two (82)% of participants had at least one failure to pay violation and the average number of months participants failed to pay was 5.5 ($SD = 5.07$). The next category of technical violations was *failure to report* which was measured as a continuous variable. Failure to report included any instance when a participant failed to report as directed to any appointment that the probation officer directs them to report for (e.g. office visit, assessment, violation hearing, warning hearing). Forty-six (46) % of participants had at least one failure to report violation and the average number of failure to report violations in these data was 1 ($SD = 1.70$). Technical violations for court-ordered *treatment absences* were measured as the total number of absences to mandated sessions. Among court participants, 43% had at least one treatment absence and the average number of treatment absences was 1.2 ($SD = 2.02$). *Positive drug tests* were measured as the total number of positive drug tests (e.g. urine tests, hair tests, and saliva tests), including admissions of use where a participant was not given a test but admitted to illegal use of drugs or alcohol. In this jurisdiction when drug court participants admit to using drugs and/or alcohol, which is a violation of their conditions of probation, this is considered the same as a positive drug test by the drug court judge and the probation department. Forty-five (45)% of participants had at least one positive drug test and the average number of positive drug tests for court participants was 1 ($SD = 1.48$). Last, a measure of *other violations* included all other categories of technical violations for conditions of probation including: community service violations, failure to notify an officer of an address change, failure to remain in the county without permission to leave, failure to call the daily drug testing line (each day the participant fails to call the drug testing line is counted as a violation), and failure to avoid people/places of disreputable or harmful character. Sixty-six (66)% of participants had at least one "other" violation and the average number of "other" violations was 3.03 ($SD = 4.15$).

Outcome Variables

An outcome variable labeled *revocation* was included to indicate whether probationers were revoked during the drug court program, defined as having his/her probation revoked and being sentenced to incarceration (1 = revocation, 0 = successful completion). Revocations in these data represent probationers who failed to complete the program due to either technical violations and/or those revoked for

a new offense. The decision to revoke a drug court participant is a decision made by the drug court team. Weekly staffings are held with the judge and probation officers prior to the drug court docket, where the judge reviews the case, prior sanctioning efforts, and interventions. This provides consistency and reduction in variance of revocation requests by officers. Moreover, the drug court program utilizes progressive sanctions guidelines to promote consistency in sanctioning while also offering incentives for compliance and interventions to address criminogenic needs. Guidance is provided for when to complete a report of violation, however, there is no set number of violations at which point a motion to adjudicate or revoke is filed because each participant's individual circumstances are taken into consideration. However, court guidelines do require a motion to adjudicate/revoke be filed when an offender is arrested for a new offense charge above a Class C misdemeanor (only punishable by a fine). The officer is to complete the paperwork within three days of notification of the new arrest. Revocation types were collapsed into one measure as new offense revocations were not frequently observed in these data ($n = 5$). Of the entire sample, 24% of court participants were revoked during participation ($n = 30$).

A second outcome variable labeled *jail sanction* was considered in order to examine the relationship between technical violations and receiving jail time during court participation. This measure was calculated as the number of days in jail as a condition of probation due to violations while in the court program. Court participants spent an average of 8.3 days in jail for program violations ($SD = 11.97$).

Demographic and Probation Variables

Several demographic and supervision-related variables found to be related to drug court completion were included in the analyses (see Gray and Saum 2005; Jaffe et al. 2012; Listwan et al. 2002; Miller and Schutt 2001; Peters and Murrin 2000; Sechrest and Shicor 2001; Taxman 1999). A continuous measure of *age* (measured in years) was included as a potential control variable (Jaffe et al. 2012; Peters and Murrin 2000). *Gender* is also linked to drug court outcomes and a dichotomous measure was considered as a control variable (0 = Male, 1 = Female; Gray and Saum 2005; Listwan et al. 2002; Taxman 1999). Prior research demonstrates that race and ethnicity may be associated with drug court success (Sechrest and Shicor 2001). Race was coded in these data as a series of three dichotomous variables, *White* (1 = White, 0 = Non-White), *Black* (1 = Black, 0 = Non-Black), and *Hispanic* (1 = Hispanic, 0 = Non-Hispanic).[1] *Marital status* was included as dichotomous measure (0 = Not Married, 1 = Married).

Additionally, both education and employment are correlated with drug court outcomes, whereas being employed and having a higher level of education is associated with an increased likelihood of court completion (Butzin et al. 2002; Gray and Saum 2005; Mateyoke-Scrivner et al. 2004; Roll et al. 2009). A dichotomous measure of *Employment* at time of court enrollment was included (1 = Employed, 0 = Unemployed). *Highest level of education* was measured as a categorical variable (1 = 6th

[1] An "Other" Race category was created to include the one court participant that was Asian. However, as there was only one observation this individual was included in the White reference category.

grade or below, 2 = 7th to 11th grade, 3 = HS/GED or above, 4 = Some College or above).[2]

Three supervision-related variables were included as control variables. A categorical variable measuring *risk level* was included in order to consider the probationer's level of risk during court participation (1 = Low or Low/Moderate, 2 = Moderate or Medium, 3 = High or Very High). The jurisdiction implemented the Texas Risk Assessment System (TRAS) in late 2015, a statewide risk assessment tool that was modeled after the validated statewide Ohio Risk Assessment System (ORAS) (Latessa et al. 2010),[3] but many participants in the program were probated prior to this date and thus were assessed using the Wisconsin Risk/Needs Assessment. A measure indicating the severity of the offense labeled *Offense Level* (1 = 1st Degree Felony, 2 = 2nd Degree Felony, 3 = 3rd Degree Felony, 4 = State Jail Felony)[4] was considered. Last, a measure labeled as *time in court program* was included and measured as the number of months that the participant was in the drug court program. Prior research reports that longer times in drug court is correlated with successful completion (Banks and Gottfredson 2004; Belenko 1998; Goldkamp et al. 2001; Peters et al. 2001). However, it is important to point out that a measure of time in treatment does not necessarily account for the quality of treatment services received (Bouffard and Taxman 2004).

Analytical Plan

Data were first analyzed using a series of logistic regression models in order to assess the relationship between technical violations and drug court outcomes. Prior to conducting the analyses, bivariate correlations were calculated to assure that multicollinearity was not an issue in these data (Mean VIF = 1.29). Further, non-normally distributed variables were transformed to meet the assumptions for univariate normality.[5] The first series of models were estimated to examine the relationship between the total number of technical violations and drug court revocation. Next, several models assessing the relationship between specific violation categories and revocation were estimated. Last, negative binomial regression models were conducted to assess the relationship between technical violations and jail sanctions.

[2] The state oversight agency requires all probation departments to report certain data using the exact same variable attributes, and provides the attributes for level of education. Moreover, state guidelines require offenders with a 6th grade level of education or below to be referred to adult literacy classes, those with less than a high school diploma (7th to 11th grade) are to be referred to General Equivalency Diploma classes, thus the categorization of education levels in this study.

[3] While there are no known validation studies published using the TRAS, the instrument it was based on, the ORAS was used on a diverse sample from Texas and was found to be predictive of reoffending. Thus, modifying the ORAS for Texas-specific legal factors resulted in the adopted TRAS instrument (Lovins et al. 2018).

[4] 1st degree felony carries a punishment of 5–99 years in prison; 2nd degree felony carries a punishment of 2–20 years in prison; 3rd degree felony carries a punishment of 2–10 years in prison; and, a state jail felony carries a punishment of 6 months to 24 months in a state jail facility, which is a facility for the less serious felonies designed to separate these lower level felonies from the more serious felonies in the standard state penitentiary.

[5] The variable Age was log transformed to meet normality assumptions. The variables Total Violations and Jail Sanctions were transformed using the square root to meet normality assumptions.

Results

Descriptive and Bivariate Statistics

Table 1 provides the descriptive statistics for court participants in the sample ($n = 123$). Approximately 24% of the sample were revoked during the court program. Participants had an average of 12.85 technical violations. The average length of program participation was 11.32 months. The average number of days participants were sanctioned to jail was 8.3. The most common technical violation was Failure to Pay, with 82% of participants failing to pay at least once. Prevalence of any technical violation were as follows: "Other" violations (66%), Failure to Report (46%), Positive Drug Tests (45%), and Treatment Absences (43%).

Next, differences between revoked participants and those who successfully completed the program were assessed. Table 2 presents the mean differences based on court outcome. Participants who were revoked received significantly more days in jail ($t = -3.08$, $p < .05$), had a higher number of failures to report ($t = -2.41$, $p < .05$), and have more positive drug tests ($t = -4.03$, $p < .01$). Additionally, revoked participants were significantly less likely than completers to be employed ($x^2 = 23.81$, $p < .001$), married ($x^2 = 23.81$, $p < .001$), spend less time in the program ($t = 5.60$, $p < .001$), and have fewer failure to pay violations ($t = 2.11$, $p < .05$). It is interesting to note that there were no significant differences found regarding supervision characteristics.

Table 1 Descriptive Statistics for Drug Court Participants ($n = 123$)

Variable	Mean	S. D.	Minimum	Maximum
Revocation	0.24	0.43	0	1
Jail Sanctions	8.33	11.97	0	63
Age	37.08	9.06	21	61
Gender	0.50	0.5	0	1
White	0.81	0.39	0	1
Black	0.18	0.38	0	1
Hispanic	0.11	0.32	0	1
Married	0.11	0.31	0	1
Highest Level of Education	2.72	0.79	1	4
Employed	0.74	0.44	0	1
Risk Level	1.80	0.83	1	3
Time in Court Program	11.32	7.43	0	25
Total # of Violations	12.85	10.07	0	67
Average # of Technical Violations Per Month	1.48	1.54	0	9.67
Failure to Pay	5.51	5.07	0	22
Failure to Report	0.99	1.70	0	12
Treatment Absences	1.16	2.02	0	11
Positive Drug Tests	1.00	1.48	0	6
Other Violations	2.95	4.15	0	28

Table 2 Sample Means for Participants by Court Outcome ($n = 123$)

Sample Characteristics	Revoked ($n = 30$)	Successfully Completed ($n = 93$)	Difference test statistic (t, x^2)
Jail Sanctions	14.00	6.51	$t = -3.08$*
Age	36.20	37.37	$t = 0.61$
Gender	0.47	0.51	$x^2 = 0.13$
White	0.73	0.84	$x^2 = 1.66$
Black	0.23	0.16	$x^2 = 0.80$
Hispanic	0.07	0.13	$x^2 = 0.87$
Highest Level of Education	2.50	2.79	$x^2 = 4.07$
Employed	0.40	0.85	$x^2 = 23.81$***
Married	0.10	0.49	$x^2 = 8.00$**
Risk Level	2.10	1.70	$x^2 = 5.77$
Time in Court Program	5.40	13.22	$t = 5.60$***
Total # of Violations	14.07	12.46	$t = -0.76$
Failure to Pay	3.83	6.05	$t = 2.11$*
Failure to Report	1.63	0.78	$t = -2.41$*
Treatment Absences	1.23	1.13	$t = -0.22$
Positive Drug Tests	1.90	0.71	$t = -4.03$**
Other Violations	3.53	2.76	$t = -0.88$

*$p < .05$, **$p < .01$, ***$p < .001$

Multivariate Analyses

RQ1: Does the Overall Number of Technical Violations Predict Revocation?

In order to address the first research question, whether the total number of technical violations predict drug court revocation, a logistic regression model was estimated. Fit statistics are reported and include pseudo R^2 and the area under the curve (AUC), suggesting a good model fit. Table 3 reports the model findings using odds ratios (OR). In the model, the total number of violations significantly increased the odds of revocation for program participants ($OR = 1.11$, $p < .01$). Further, the analysis identified three factors that decreased the odds of revocation including: having a higher level of education ($OR = 0.33$, $p < .05$), being employed ($OR = 0.16$, $p < .01$), and spending a longer time in the court program ($OR = 0.70$, $p <. 01$).

RQ2: Do Specific Categories of Technical Violations Predict Revocation?

Next, a series of logistic regression models were estimated to examine whether specific categories of technical violations predicted drug court revocation. In order to assess the impact of specific violations, each category was assessed in a separate model. After estimating the individual models, a final model was run that included all categories. Table 4 reports the results of both the individual category models and the combined

Table 3 Logistic Regression of Total Violations and Revocation

Variable	Odds Ratio	Std. Err.	$P > z$	Confidence Interval
Total # of Technical Violations	1.11**	0.04	0.00	1.04–1.19
Age	1.01	0.04	0.85	0.93–1.09
Gender	0.65	0.44	0.52	0.17–2.46
Black	0.55	0.46	0.47	0.10–2.81
Hispanic	1.26	1.40	0.83	0.14–11.09
Highest Level of Education	0.33*	0.16	0.02	0.13–0.84
Married	0.64	0.51	0.58	0.13–3.10
Employed	0.16**	0.11	0.01	0.04–0.62
Offense Level	1.90	0.79	0.13	0.84–4.29
Risk Level	0.66	0.28	0.34	0.29–1.53
Time in Court Program	0.70**	0.07	0.00	0.57–0.86

*$p <$ .05, **$p <$ .01, ***$p <$ .001

$n = 123$

Log likelihood = −36.73

Pseudo $R^2 = 0.46$

AUC = 0.92

final model. In the individual analyses there were several categories that were found to significantly increase the odds of revocation including: failure to report ($OR = 2.21$, $p < .05$), positive drug tests ($OR = 2.45$, $p < .001$), and other violations ($OR = 1.18$, $p < .05$). Categories that did not significantly impact revocation included failure to pay and treatment absences. Among all of the individual models, highest level of education, employment, and months spent in the drug court program significantly decreased the odds of revocation. Interestingly, no other factors were significantly associated with increased odds of revocation. In the final model considering all categories of technical violations, only positive drug tests increased the odds of revocation ($OR = 2.45$, $p < .01$). Further, education level ($OR = 0.29$, $p < .05$), employment ($OR = 0.14$, $p <$. 05), and time in the program ($OR = 0.68$, $p < .01$) all remained significant factors.

Supplemental analyses were conducted for the predictors that were significant in the preliminary analysis, total number of violations and positive drug tests. The number of total technical violations were dichotomized above/below the median (11) and mean (12.85). The results of these analyses were substantively the same as the first group of analyses. The authors found that those who had more than the median (11) and mean (12.85) number of technical violations were significantly more likely to be revoked than those who had below this threshold. The authors ran another analysis dichotomizing total violations above Quartile 1 (5) and found the same effects.[6]

[6] As the results were substantively the same these Tables were not provided in the manuscript. The results of the supplemental analyses are available upon request.

Table 4 Logistic Regression for Specific Technical Violations and Revocation ($n = 123$)

	Failure to Pay		Failure to Report		Treatment Absences		Positive Drug Tests		Other Violations		All Violations	
Variable	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Age	0.97	0.04	0.99	0.04	0.97	0.03	0.98	0.04	0.99	0.04	1.01	0.05
Gender	0.66	0.42	0.85	0.53	0.75	0.48	0.55	0.41	0.68	0.44	0.67	0.54
Black	0.95	0.77	1	0.78	0.86	0.71	0.19	0.19	0.81	0.66	0.18	0.18
Hispanic	0.85	0.84	1.48	1.51	1.11	1.11	1.18	1.47	0.88	0.95	1.95	2.61
Highest Level of Education	0.37*	0.16	0.32*	0.15	0.41*	0.17	0.29*	0.15	0.33*	0.15	0.29*	0.16
Married	0.62	0.45	0.61	0.46	0.63	0.47	0.39	0.37	0.58	0.46	0.45	0.44
Employed	0.11**	0.07	0.16**	0.11	0.11**	0.07	0.11**	0.08	0.14**	0.09	0.14*	0.11
Offense Level	1.99	0.78	1.84	0.74	2.04	0.81	2.17	1.03	2.09	0.85	1.7	0.81
Risk Level	0.67	0.27	0.65	0.27	0.77	0.32	0.62	0.28	0.58	0.25	0.64	0.34
Time in Court Program	0.78**	0.06	0.79**	0.06	0.81**	0.05	0.74**	0.07	0.74**	0.07	0.68**	0.09
Failure to Pay	1.1	0.1									1.04	0.11
Failure to Report			2.21*	0.86							1.45	0.63
Treatment Absences					1.16	0.18					1.27	0.23
Positive Drug Tests							2.45***	0.61			2.35**	0.63
Other Violations									1.18*		1.06	0.11
Pseudo R^2	0.4		0.42		0.39		0.52		0.43		0.55	
AUC	0.9		0.92		0.9		0.94		0.91		0.95	
Log Likelihood	−41.25		−39.67		−41.44		−32.63		−39.23		−30.74	

*$p < .05$, **$p < .01$, ***$p < .001$

RQ3: Does the Overall Number of Technical Violations Predict Jail Sanctions?

In order to answer the third research question, a negative binomial regression was estimated to examine the relationship between technical violations and jail sanctions. Negative binomial regression was chosen as a large number of participants received zero days in jail as a result of a technical violation (43%), thus the outcome variable was over dispersed in these data. Further, the model was chosen after comparing fit statistics (AIC and BIC) to ensure the best fitting model for these data. Table 5 provides the results of the negative binomial regression estimating the effects of the total number of violations on jail sanctions. The first column reports the regression coefficient (*b*) along with the standard error (*SE*). The second column provides the factor change in the expected count of jail sanction days (*Exp*(*b*)). The last column, and the primary focus, is the percentage change in the expected count of jail sanction days for a 1 unit increase of the independent variable, holding all other factors constant (% *Exp* (b)). In the

Table 5 Negative Binomial Regression of Total Violations and Jail Sanctions

Variable	*b (SE)*	*Exp (b)*	*% Exp(b)*
Total # of Technical Violations	0.09 (0.19)	1.09	138.6***
Age	−0.02 (0.02)	0.98	−20.1
Gender	0.14 (0.31)	1.15	7.0
Black	−0.05 (0.39)	0.95	−2.0
Hispanic	−0.72 (0.54)	0.49	−20.5
Highest Level of Education	−0.17 (0.19)	0.85	−12.5
Married	−0.82 (0.33)	0.43	−56.1*
Employed	−0.72(0.37)	0.49	−27.1
Offense Level	−0.10 (0.19)	0.90	−8.8
Risk Level	0.07 (0.20)	1.07	5.7
Time in Court Program	−0.01 (0.02)	0.99	−5.5

*$p < .05$, **$p < .01$, ***$p < .001$

$n = 123$

AIC = 696.961

BIC = 727.895

model, only the key independent variable, total violations, had a significant effect on jail sanction days among drug court participants. Having a higher number of total violations significantly increased the expected count of jail sanction days by 138.6% ($p < .05$).

RQ4: Do Specific Categories of Technical Violations Predict Jail Sanctions?

Last, a series of negative binomial regressions were estimated to investigate whether the effects of violations on jail sanctions varied by violation category.[7] Table 6 reports the results of the negative binomial regression models estimating the effects of the specific categories of violations on the count of jail sanctions.[8] In the individual models examining categories of violations, all categories significantly increased the expected count of jail sanctions with the exception of failure to pay. Failure to report significantly increased the expected count of jail sanctions by 97.2% ($p < .01$), treatment absences significantly increased the expected count of jail sanctions by 29.6% ($p < .05$), positive drug tests increased the expected count of jail sanctions by 67.6% ($p < .001$), and "other" violations increased the expected count of jail sanctions by 16.5% ($p < .01$). In the model including all categories of violations, failure to report increased the expected count of jail sanctions by 62.4% ($p < .01$), treatment absences increased the expected count of jail sanctions by 26.7% ($p < .01$), and positive drug tests increased the expected count of jail sanctions by 57.8% ($p < .001$). Further, in the final model, being married significantly decreased the expected count of jail sanctions by 56.8% ($p < .05$) and being employed decreased the expected count of jail sanctions by 52.8% ($p < .05$).

[7] AIC and BIC fit statistics were assessed to ensure the best-fitting models.

[8] Due to space constraints, the results for the Failure to Pay model are not reported in the Table as they were non-significant. These results are available upon request.

Table 6 Negative Binomial Regression for Specific Technical Violations and Jail Sanctions ($n = 123$)

	Failure to Report		Treatment Absences		Positive Drug Tests		Other Violations		All Violations	
Variable	*b (SE)*	*% Exp(b)*	*b (SE)*	*% Exp(b)*	*b (SE)*	*% Exp(b)*	*b (SE)*	*% Exp(b)*	*b (SE)*	*% Exp(b)*
Age	−0.03 (0.02)	−2.7	−0.02 (0.02)	−2.1	−0.04 (0.02)	−3.9	−0.04 (0.05)	−3.6*	−0.01 (0.02)	−1.4
Gender	−0.03 (0.35)	−3.3	0.20 (0.35)	22.1	−0.06 (0.32)	−5.8	0.02 (0.34)	2.0	0.05 (0.29)	4.8
Black	0.26 (0.41)	29.7	0.32 (0.42)	37.0	−0.36 (0.42)	−30.2	0.31 (0.41)	36.3	−0.51 (0.35)	−40.1
Hispanic	−0.60 (0.55)	−45.2	−0.98 (0.56)	−62.6	−0.68 (0.53)	−49.1	−0.77 (0.58)	−53.4	−0.69 (0.49)	−50.2
Highest Level of Education	−0.16 (0.44)	−14.5	−0.03 (0.21)	−2.9	−0.08 (0.18)	−7.7	−0.03 (0.20)	−3.1	−0.11 (0.18)	−10.6
Married	−0.82 (0.01)	−56.1*	−0.79 (0.04)	−54.8*	−0.73 (0.02)	−52.0*	−0.97 (0.01)	−62.5*	−0.84 (0.01)	−56.8*
Employed	−0.80 (0.40)	−55.3*	1.09 (0.41)	−66.4**	−0.95 (0.39)	−61.4*	−0.67 (0.41)	−48.8	−0.75 (0.34)	−52.8*
Offense Level	−0.11 (0.20)	−10.8	0.12 (0.19)	12.2	−0.09 (0.18)	−8.1	0.035 (0.19)	3.7	−0.18 (0.17)	−16.4
Risk Level	0.04 (0.22)	4.4	0.21 (0.22)	23.7	−0.17 (0.20)	−16.0	0.082 (0.22)	8.5	−0.10 (0.20)	−9.2
Time in Court Program	0.04 (0.02)	4.2	0.04 (0.03)	4.1	0.04 (0.02)	3.9	0.02 (0.02)	2.0	0.03 (0.03)	3.0
Failure to Report	0.68 (0.21)	97.2**							0.49 (0.18)	62.4**
Treatment Absences			0.26 (0.11)	29.6*					0.24 (0.08)	26.7**
Positive Drug Tests					0.52 (0.12)	67.6***			0.46 (0.11)	57.8***
Other Violations							0.15 (0.05)	16.5**	0.05 (0.04)	5.0

*$p < .05$, **$p < .01$, ***$p < .001$

Discussion and Conclusion

While it has been established that drug courts can reduce recidivism in substance using populations (Mitchell et al. 2012), it is important to note that a large number of court participants commit technical violations that can jeopardize their success in such programs (Guastaferro and Daigle 2012). The current study's results support prior research on the frequency of violations, finding that 96% of the sample had at least one violation and the average number of violations was 12.85. The current research explored the role that technical violations play in probation revocation and examined how specific categories of violations may be more predictive of both failure and receiving jail sanctions while in drug court. Overall, the results suggest court administrators may benefit by considering specific types of violations as potential risk factors for revocation.

Regarding the total number of violations, the analyses found support that higher number of violations increases both the likelihood of probation revocation and receiving jail sanctions. This supports prior findings that participants with frequent violations are more likely to be revoked or receive stringent sanctioning such as jail time (Arabia et al. 2008; McRee and Drapela 2009). The drug court examined in the current study holds weekly dockets and staffings are held with the judge prior to the docket to discuss recent violations and formulate a plan to address them. The team considers any prior violations and progressive sanctions and interventions imposed when deciding how to address current or recent violations, so as to follow the court's progressive sanctions policy. Utilizing a team approach and involving the judge provides consistency in decision-making and reduces potential differences amongst probation officers' decisions to file reports of violations to the court. Officers learn the philosophy and expectations of the judge, become very versed in the drug court policy and progressive sanctions model. For instance, if a participant tests positive on a drug test, they are contacted immediately after receiving the results and are told to report to their probation officer to discuss the relapse. While it is beyond the scope of this paper, prior research has found that the relationship between technical violations and program success might be further understood by considering the timing of such sanctions (Hawken and Kleiman 2009).

The central purpose of the study was to examine the potential heterogeneous effects of technical violations on probation revocation. The results demonstrate that different types of violations are more influential in predicting revocation in the jurisdiction examined, which is an important distinction to make. The "not paying fees" technical violation failed to significantly predict both revocation and receiving jail sanctions. Our findings reveal the court did not punish offenders for their inability to pay, which is contrary to what many critics of probation believe (Sobol 2015). A possible explanation for this is that sanctioning and revocation is typically reserved for more severe violations (Arabia et al. 2008). When considered individually the following violations significantly increased the odds of revocation: failure to report, positive drug tests, and other violations.

However, once all categories of sanctions were included in a final model, only positive drug test violations remained significant. This finding is similar to the results of Shannon et al.' (2016) examination of factors associated with court outcomes, which found that positive drug tests were significantly related to failure. These results suggest

it may be important for drug court practitioners, such as probation officers and judges, to consider positive drug tests during drug court as an early indicator that someone may be susceptible to program failure. As a response to such violations, it may be necessary to consider more intensive treatment options in order to reduce future substance use. Additionally, the results of the analyses found that spending a longer time in the program reduced the likelihood of revocation. These results are in line with prior research (see Rempel and Destefano Depies 2002; Taxman and Bouffard 2005) and highlight the importance of program retention.

The current study also assessed the role that specific technical violations had on a central component of many court programs, jail sanctions. Individual models found that all categories of violations, with the exception of failure to pay, significantly increased the number of jail sanctions. After controlling for all categories of technical violations, other violations were no longer significant. These findings highlight that specific categories of violations are more predictive of sanctions rather than overall failure. While failure to report was not a significant predictor of revocation, it had the strongest effect on the number of jail sanctions received. This may be explained by the fact that failure to report may serve as an early "red-flag" for absconding, a type of technical violation considered to be a public safety risk because offenders stop checking in with the probation officer for a lengthy period of time, stop complying with other conditions of supervision, and are thereby unmonitored in community or have left the jurisdiction altogether. Thus, judges and drug court officers may be more likely to utilize jail sanctions in response to such violations. Further research, especially qualitative in nature, is needed to understand the exact sanctioning mechanisms that may put these findings in context.

Based on our findings, there are several salient implications for practitioners. First, the jurisdiction under study is considered more politically conservative in comparison to other large urban jurisdictions in the state which may reflect in their decisions to revoke. Prior research has supported that those with more conservative sociopolitical attitudes may believe drug treatment is not adequately punitive because drug use is equated with criminality, the more appropriate response would be incarceration or other penalties, or the drug treatment service is provided to "undeserving" recipients (Timberlake et al. 2001).

Despite the fact the drug court team, which includes the judge, holds weekly staffings prior to docket to discuss the participant's current violations in the context of past violations, interventions and sanctions, participants had on average 1.2 positive drug tests when revoked. The extant literature is replete with evidence supporting the fact that relapse is part of recovery and is not uncommon for those who are in treatment or seeking treatment (Alemi et al. 2004; Leukefeld and Tims 1989; McKeganey 2000; Porter 2000). Technical revocations while in a drug court program can be reduced by practitioners knowing that drug court participants may very well use drugs even after undergoing treatment—that these relapses can be used as teaching moments to help offenders understand relapse triggers and the recovery process. The number of positive drug tests, which was most predictive of drug court failure were not particularly high in the current study. More research is needed to better understand whether a threshold or "tipping point" exists that leads to revocation decisions for technical violations such as continued drug use.

The jurisdiction under study individualizes justice for drug court participants, taking into consideration violations, prior sanctions, interventions, failed attempts for various types of treatment interventions, instead of setting a specific threshold for revocation of probation that should indicate that the participant is to be revoked. Perhaps drawing upon the literature related to how correctional orientations of probation officers, judges, and other criminal justice actors influence decision making (Ricks and Eno Louden 2015; Steiner et al. 2011; Whitehead and Lindquist 1989), future qualitative research would improve understanding the context of the revocation decision by the treatment team.

Our results support prior research that employment during drug court participation operates as a protective factor (Butzin et al. 2002; Hartley and Phillips 2001; Roll et al. 2009). Studies have shown that stable employment is associated with reduced instances of substance use and the severity of relapse, as well as improved community reintegration (Comerford 1999; Leukefeld et al. 2004; Vaillant 1988; Zanis et al. 1994). Furthermore, stable employment serves to interrupt addiction patterns and unemployment has proven to be a stronger predictor of relapse than the severity of a client's addiction (Vaillant 1988). Thus, investing more in assisting drug court participants in finding employment may help reduce revocation rates among drug court participants (Staton et al. 2001). Programs with more proactive policies regarding offender employment assistance may see better results in program outcomes. Qualitative research illustrates that participants in drug court report feeling conflict between meeting treatment requirements makes it difficult to maintain employment during participation (Wolfer 2006). More research is needed in this area to examine the relationship between employment and revocation decisions in drug court.

While courts cannot ignore violations of community supervision, especially continued drug use by a felon on supervision for a drug-related crime, taking a more therapeutic approach to violations of this nature and recognizing them as part of the disease can help to reduce technical revocations in drug court programs. Beginning in the 1970s, policy shifts in probation resulted in a more surveillance and enforcement focus rather than a rehabilitative one (Cullen and Gendreau 2000; Rhine 1997). However, more recently policies and fiscal constraints have led probation departments to move away from a strict law enforcement and surveillance approach to an evidence-based and treatment-oriented framework (Cullen and Jonson 2012; Grattet et al. 2018). Thus, it will take a continued paradigm shift in the way courts and probation officers view their roles in the context of supervision of offenders with drug and alcohol addiction to reduce the overreliance of revocation for technical violators.

While the current study provides an initial exploration into the heterogeneous effects of technical violations on drug court outcomes, it is not without its limitations. First, the results of the analyses reflect one drug court in an urban county in the southwestern United States. As such, these findings are not generalizable beyond this sample of court participants in the jurisdiction examined. However, this research provides a framework for similar assessments of technical violations in other drug court programs.

Another limitation of these data is that information on the quality of interventions or the increasing levels of treatment received was not available. This is important to highlight as prior research has found that both treatment intensity and quality is linked to probationer success (Bouffard and Taxman 2004; Friedmann et al. 2007). The court matches participants with the appropriate level of treatment intervention utilizing the least restrictive environment to address the substance abuse issue. The treatment

continuum includes detoxification, supportive outpatient, intensive outpatient, short term residential treatment, individual counseling and support group meetings. The court does recognize relapse as part of recovery and routinely refers clients to higher levels of treatment where warranted. Residential treatment programs utilized by this court range from 30-day programs up to 90-day programs. It may be that clients participating in this program actually require lengthier treatment programs and are thus being inappropriately placed. Court participants can also be unsuccessfully discharged from the program, returned to their original court of jurisdiction and court-ordered to a state-operated substance abuse facility for residential treatment lasting up to 9 months. It would be important to investigate how many offenders were referred to higher levels of treatment after relapsing and how many times this occurred before being unsuccessfully discharged and subsequently revoked from community supervision.

Another limitation of these data is that "other" violations were collapsed in one category, thus there was no way to parse out the specific violation counts for other conditions of probation. Future research is necessary to understand the context surrounding the revocation decision and may benefit from the use of qualitative methods in order to identify which specific factors lead to the revocation decision. Finally, it is necessary to clarify that the current investigation is not a process evaluation of the drug court program. As such, questions of adherence to the National Association of Drug Court Professionals list of Best Practices (2018) are unable to be assessed using the current data.

Overall, the impact that different types of technical violations have on probation revocation has largely been neglected. The current study finds support that technical violations in drug court have heterogeneous effects on the likelihood of revocation. Collectively, the results demonstrate that violations associated with continued drug use during court participation are more predictive of revocation and jail sanctioning than other types of violations. Therefore, these findings suggest the need for drug court personnel to identify and address continued drug use during court participation early on in order to reduce revocations. More research is warranted in order to substantiate these findings.

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Compliance with Ethical Standards

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