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Does the probability of DWI arrest fall following participation in DWI and hybrid drug treatment court programs?

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Abstract

Using North Carolina administrative data, this study examined recidivism following participation in specialty hybrid drug and driving while intoxicated (DWI) court programs. Three court program participation levels were considered—being referred to, enrolling in, and completing a specialty court program. Measures of DWI recidivism were: arrest and total number of arrests for DWI, and being convicted of DWI during follow-up periods of two and, alternatively, four years. Propensity score matching was used to obtain comparable control groups. Using a four-year follow-up, persons convicted of a DWI who completed a specialty court program were associated with a greater reduction in DWI rearrests and re-convictions than did matched individuals who were never referred to a specialty court program. DWI courts were more effective in reducing re-arrests than hybrid drug courts were. Although promising from the vantage point of participants, few persons convicted of a DWI were referred to either court type, thus limiting this strategy's potential effectiveness in reducing DWI.

Keywords

hybrid drug courts; DWI courts; drinking and driving; recidivism

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1. Introduction

Driving while intoxicated (DWI) remains a substantial cause of motor vehicle injury and death in the United States (National Highway Traffic Safety Administration 2013). It is a common criminal offense, with 1.2 million persons arrested on a DWI charge in 2013 (Federal Bureau of Investigation 2013). Despite the high prevalence of drinking and driving, the probability that an intoxicated driver will be arrested is very low, estimated to be 0.1 percent by Beitel *et al.* (2000), and 0.2 percent more recently by Dowling *et al.* (2011). Hence, the vast majority of drinking and driving incidents go undetected and unpunished. Repeat offenses for DWI are common; it is estimated that 11 to 41 percent of individuals arrested for DWI are repeat DWI offenders (National Highway Traffic Safety Administration 2014). Drivers previously convicted of DWI are 62 percent more likely to be involved in a fatal crash (Fell 2014). For many of these offenders, drinking and driving reflects an underlying addiction (Lapham *et al.* 2011).

Adult drug treatment courts have been used to treat the underlying addiction of criminal offenders and thus end the cycle of recidivism. Hybrid drug treatment courts accept both drug and alcohol addicted offenders, although without special consideration for the unique differences between DWI offenders and illicit drug offenders (Bouffard *et al.* 2010).¹ Specialized DWI treatment courts, which generally only accept persons convicted on a DWI charge, have emerged more recently as a policy solution for addressing the unique needs of persons involved in alcohol-related offenses.

This study used administrative data on DWI arrests and from specialty drug treatment courts in North Carolina from 1998–2013. The purpose of this study was to assess whether the probabilities of re-arrest and re-conviction for DWI fall following participation in a treatment court program. We addressed two questions. First, are the probabilities of rearrest and re-conviction on a DWI charge lower following participation in a specialty court program compared to those with a DWI conviction who do not participate in such programs? Second, comparing drug and DWI courts, do the probabilities decrease more for participation in DWI court than in drug court programs?

2. Background and Context

Drug treatment courts have been evolving in the United States for nearly 30 years. The first drug treatment court was established in Miami, Florida in 1989, while the first DWI court, a pilot project, was started in 1995 in Las Cruces, New Mexico (Mays *et al.* 1997). In 2014, there were 1,538 adult drug treatment courts in the U.S. compared to only 242 designated DWI courts (National Drug Court Resource Center 2014).² In some states, the term “hybrid” indicates that the court accepts DWI and drug offenders. In states where both types of courts exist, courts without the hybrid designation may accept DWI offenders occasionally, but their primary focus is on crimes other than DWI.

¹Drug treatment courts vary across jurisdictions in the use of sanctions and rewards, admission criteria, and support services offered to offenders. When DTCs in other jurisdictions accept DWI offenders, these courts are often known as hybrid DTCs.

²The number of adult drug treatment courts does not include family treatment, reentry, federal, veterans, or tribal courts.

In 2012, North Carolina had 20 adult drug treatment and six DWI courts (Transportation 2012, National Association of Drug Court Professionals 2013).³ In North Carolina, all drug courts have admission criteria which include DWI offenders, and function as hybrid courts, although not labeled as such. Participation in both DWI and drug treatment courts is voluntary.

Both DWI and drug courts are court-based interventions that use a team-based approach involving judges, prosecutors, defense attorneys, probation officers, police, and treatment providers. All parties work collaboratively to deal with the program participants' underlying addiction using a combination of treatment, judicial supervision, mandatory drug testing, incentives, and penalties. In North Carolina, eligibility is restricted to high risk and high need offenders who are chemically dependent (North Carolina Administrative Office of the Courts 2010). A referral to a specialty court can occur pre-plea, post-plea, or post-sentencing; most such courts in North Carolina receive post-plea or post-sentencing referrals (Innovation Research & Training 2005f, a, b, c, d, e, g). Nationally, pre-plea referrals are more common (Mitchell 2011).

Drug court programs generally last 12 to 18 months although some participants take longer to complete a program. In North Carolina, the time to completion for persons who completed a DWI or drug court program was 14.2 months (median) and 15.1 (mean). To graduate, participants must demonstrate continued abstinence from addictive substances, often for 6+ months (Huddleston and Marlowe 2011). Program completers must satisfy treatment and supervision criteria, pay fees and fines, and complete community service requirements (Huddleston and Marlowe 2011). Program completers generally receive a sentence of time served (where their sentence is the time they already spent in jail prior to treatment court) or probation (Mitchell *et al.* 2012). Failure to complete a program is quite common—approximately 25 percent or more fail to complete (U.S. General Accounting Office 1997, Belenko 2001, Mitchell *et al.* 2012).

Despite similarities, the two types of courts differ in how they approach treatment of program participants, reflecting different needs of DWI and drug offenders. For example, transportation may be more of a challenge for DWI offenders as many states have mandatory license suspension for a DWI conviction (Bouffard *et al.* 2010, National Center for DWI Courts). One of *The Ten Guiding Principles of DWI Courts* addresses transportation issues (National Center for DWI Courts).⁴

Another key difference between the participants in the two courts is drug of choice. Alcohol is typically the drug of choice for DWI program participants. Since the body quickly metabolizes alcohol, increased monitoring and supervision is necessary to ensure compliance. As suggested by *The Ten Guiding Principles of DWI Courts*, community supervision is important to program success. Supervision includes random drug tests,

³The number of drug treatment courts in 2012 was lower than the number used in our analysis. One reason is that we only included courts reporting to the state. One court ceased operation between 2010 and 2012. The last year for which our study monitored receipt of treatment was 2011. Data for 2012 and 2013 were used exclusively for the two-year follow-up period. With a four-year follow-up, 2009 was the last year treatment was received in our data. See the next section for additional details.

⁴Possible solutions offered by a DWI court include providing indigent participants with bus passes or connecting them with a bicycle loan program in the community.

frequent judicial review, and home visits (National Center for DWI Courts). In contrast, since hybrid drug courts enroll many types of participants, they are not as tailored to address the unique needs of DWI offenders and may be less effective in treating DWI offenders as DWI courts are (Freeman-Wilson and Huddleston 1999).

Existing research suggests this is so. Bouffard *et al.* (2010) examined whether hybrid drug courts succeeded in treating DWI offenders. Using data from two hybrid drug treatment courts, DWI offenders who participated in a drug court program were compared with DWI offenders who were sentenced to prison followed by a term of parole. No differences between the two groups in the rate of re-arrest were found.

One evaluation of the effect of DWI courts on recidivism rates compared DWI court participants with DWI offenders from the same counties who satisfied DWI court eligibility criteria in the year prior to DWI court implementation (Michigan Supreme Court and NPC Research 2008). DWI court participants were significantly less likely in two out of the three counties to be arrested for any new criminal offense within two years of entry, and significantly less likely to be arrested for a new DWI offense in one of the counties.

Mitchell *et al.* (2012) conducted a meta-analysis of the effects of traditional and non-traditional drug courts on recidivism. The non-traditional court types treated populations other than illicit drug users, the original target group of drugs courts. The non-traditional courts included DWI courts. The authors identified 92 studies of adult drug courts and 28 studies of DWI courts. Three-quarters of these studies of DWI courts had follow-up periods of a year or less. Findings on the effectiveness of DWI courts on recidivism were mixed with methodologically weak evaluations generally finding larger reductions in recidivism than the experimental studies. Among the four experimental studies reviewed, three found that DWI court participation was associated with a small reduction in the odds of recidivism while one study found a small non-statistically significant increase in the odds of recidivism. When the results of the four studies were analyzed as a group, the mean odds ratio was small and not statistically significant.

Sloan *et al.* (2013) analyzed data from eight DWI courts—seven from Michigan and one from North Carolina. A general finding was that higher service intensity (more services provided per participant per time period) was associated with better outcomes such as the probability of participants completing the court program, whether or not educational attainment increased post- versus pre-enrollment, and whether or not the participants employment status improved post- versus pre-enrollment.

In North Carolina, the participant selection process differs between DWI and hybrid drug treatment courts. DWI courts focus on persons convicted of serious DWI offenses, who were sentenced to supervised probation, with a court finding of at least one of the following aggravating factors: (1) driving while license revoked following conviction for DWI; (2) causing serious injury to another person as a result of DWI; or (3) a DWI conviction involving a child under age 16 in the vehicle (North Carolina Administrative Office of the Courts 2011). DWI courts focus on the highest risk and highest need repeat offenders; so first time offenders are rarely admitted (Parker and Smith 2011). Drug treatment courts focus

on a myriad of criminal offense types as well as drug addictions.⁵ Admission policies of drug treatment courts vary among courts, but state guidelines specify that such courts may accept substance-addicted individuals with a felony conviction or a sentence of community punishment that are at risk of revocation of their sentence; such courts are used as a form of intermediate punishment (Parker and Smith 2011).

Hispanic men in the state were arrested at a rate almost double their share of the population, whereas the share of black drivers arrested for drunk driving matched their representation in the population, around 20 percent (Griffin *et al.* 2013). Prosecution rates for DWI in the state also differed by race and gender. Hispanic men are 58 percent more likely than non-Hispanic whites to have their charges dropped (Griffin *et al.* 2013).

3. Data

Data came from two statewide databases from the state's Administrative Office of the Courts (AOC). The Automated Criminal Infraction System (ACIS) provided data on all arrests and convictions. The Drug Treatment Court Management Information System (DTC-MIS) database tracked individuals' participation in treatment court programs. Duke University's Institutional Review Board approved our data collection and analysis plan.

In the analysis with a two-year follow-up, our study used ACIS records of DWI convictions from 2002–2011 to identify persons potentially eligible for special court programs and for the four-year follow-up period if the conviction occurred in 2009 or earlier. Records from 2012 and 2013 were used exclusively for the follow-up period in the analysis with a two-year follow-up period. In the analysis with a four-year follow-up, ACIS records from 2010–2013 were exclusively used for the follow-up period. ACIS data, which recorded arrests and convictions, were merged with DTC-MIS records, which provided information of referrals to, enrollment in, and completion of specialty court programs, including relevant dates on which these events occurred. North Carolina has a mandatory one year license suspension following the first conviction for DWI.⁶ A second offense requires a minimum two year license suspension. So at least the first year after a conviction the individual would have had their license suspended.

4. Methods

4.1. Treatment groups

There were four treatment groups—persons convicted on a DWI charge who were: (1) referred to a drug or DWI court program and enrolled; (2) persons who enrolled and completed such programs; (3) referred to a DWI court only and enrolled; and (4) persons enrolled and completed a DWI court programs. To determine whether or not an individual was referred, we used the merged records from DTC-MIS and ACIS.

⁵However, alcohol is a prevalent addiction among participants in these court programs. In 2002, alcohol was the first drug of choice for 26 percent of drug treatment court participants, the second choice for 32 percent, and the third choice for 36 percent of participants. Marijuana was slightly more common as a first choice than alcohol (27%) among drug treatment court participants, but less popular as a second and third choice Craddock, A., 2002. Nc drug treatment court evaluation. US Department of Justice.

⁶N.C. Gen. Stat. §§ 20.17, 20.19.

The DTC-MIS data had fields with criminal court docket numbers and arrest dates, but these fields were often blank or there were several docket numbers and arrest dates on a DTC-MIS record; there was no field to indicate the exact docket that led to a referral. To obtain treatment groups, we first merged individuals using first and last name, birthdate, and gender. Second, we identified all of an individual's criminal dockets in ACIS that could possibly have caused a given referral. A criminal docket in ACIS was considered a potential match with DTC-MIS if it satisfied at least one of these conditions: (1) the docket number or arrest date was recorded in DTC-MIS; (2) a DWI arrest on the docket was disposed of (dismissed by prosecutor or conviction) within 60 days before the referral; (3) for pre-plea referrals for which the disposition date does not precede referral, the DWI arrest date was the sum of 60 days and the median time between arrest and disposition for DWI arrests in the county. The 60-day period was selected as a logical time span, weighing likely administrative delays in case processing against the risk that the referral stemmed from another DWI conviction that did not lead to a referral. Third, we selected the docket closest to the referral from matched criteria from satisfying condition two. The result was a one-to-one match of DTC-MIS and ACIS records. We limited the treatment groups to one referral to a specialty court/calendar year.⁷

4.2. Control groups

The control groups for all comparisons consisted of persons who were convicted of DWI but never referred to a specialty court in the time span covered by our administrative data. In such cases, there was a record of a DWI conviction in ACIS but no corresponding record in DTC-MIS. If there was more than one conviction in a calendar year, we selected the first conviction as the control.⁸ The exception is the analysis comparing DWI and hybrid drug courts. In this instance, the control group consisted of individuals enrolled in a hybrid court.

4.3. Dependent variables

There were three dependent variables for outcomes during follow-up: (1) a binary variable for one or more arrests for DWI; (2) a binary variable for one or more convictions for DWI; and (3) a continuous variable indicating the total number of DWI arrests. The follow-up period most often began with the DWI conviction date, but if a person's DWI charge was dismissed after program completion, we used the disposition date. Much of the two-year follow-up included time in the specialty court program for the treatment group. The advantage of a four-year follow-up period is that it allowed for most post-program time in which arrests and convictions could occur. Similarly, in the four-year follow-up, most individuals will have had their licenses reinstated. However, disadvantages of the longer follow-up period were loss of observations and a greater possibility for intervening events occurring, e.g., conviction on a non-DWI charge leading to incarceration and hence a period of incapacitation during follow-up, a period during which the person was not at risk of arrest.

⁷Twelve percent of referrals did not merge to a DWI conviction because they were pre-plea referrals who completed a specialty court program and their DWI charges were dismissed for this reason.

⁸1.5 percent of individuals referred to a specialty court were referred more than once during 2002–2010.

4.4. Propensity score matching

We used propensity score matching (PSM) to obtain control groups with characteristics comparable to the treatment groups.⁹ We matched on variables describing individual characteristics and arrest history: (1) other charges on the day of the arrest for DWI--drug felony, drug misdemeanor, other felony, other misdemeanor, or no other charge (omitted reference group); (2) demographic characteristics--age, gender, and race/ethnicity (black, Hispanic, other race, and omitted reference group, white); (3) arrest history--binary variables for prior DWI felony, DWI misdemeanor, drug felony, drug misdemeanor; other felony, other misdemeanor, and a continuous variable for the number of DWI convictions in the preceding four years; and (4) year and county fixed effects. Average treatment effects on the treated (ATT) measured differences in recidivism rates between treatment and control groups during follow-up.

Matching was based on predicted probabilities: enrolling versus never referred during the observational period; or completing versus never referred; or conditional on enrolling, enrolling in a DWI program versus enrolling in a drug court program and similarly for completing a program. Nearest neighbor one-to-one matching with a caliper of 0.01 was used.

To compare closeness of the match, we assessed standardized differences between treatment and control groups. A standardized difference compares mean differences in units based on the pooled (treatment plus comparison) standard deviation (Austin 2009). The standardized difference for binary variables is:

$$Stdif = \frac{(\hat{p}_{grp1} - \hat{p}_{grp2})}{\sqrt{\frac{\hat{p}_{grp1}(1 - \hat{p}_{grp1}) + \hat{p}_{grp2}(1 - \hat{p}_{grp2})}{2}}}$$

where $\hat{p}_{grp1}$ and $\hat{p}_{grp2}$ indicate the prevalence of the dichotomous variable in group 1 (treatment group) and group 2 (comparison group), respectively. The quality of the match in PSM was assessed by examining whether there was less than a 10 percent standardized difference between the two groups for each covariate after matching (Rosenbaum and Rubin 1985, Austin 2009). Matching was done in Stata SE version 14 using psmatch2 (Leuven and Sianesi 2003).

5. Results

5.1. Descriptive statistics

Among persons in the never referred group of persons convicted of a DWI, only 0.21 percent were charged with a DWI felony (Index DWI Charge Felony, Table 1, row 1, col. 1).

Twenty-two percent had a concurrent charge of a misdemeanor other than a drug charge

⁹We considered using an instrumental variables (IV) approach instead of or in addition to using PSM. One possibility would have been to use the proportion of DWI convictions in the judicial district that resulted in a referral to a specialty court. However, there are 44 judicial districts in North Carolina, and the total number of persons convicted of DWI referred to a specialty court was insufficient to support a breakdown of referrals into 44 groups.

(row 6). Charges concurrent with the arrest for DWI other than for other misdemeanor were quite rare. At the time of arrest, 20.5 percent of persons never referred to a specialty court had an arrest for DWI in the past four years (row 9). The mean age at the time of arrest was 32 years (row 16). Almost two-thirds were white (omitted reference group, 62.6%, col. 1). About one-fifth was female (row 17).

Before matching, the largest differences between the never referred (col. 1) and the referred (col. 2) groups was for prior misdemeanor arrests for DWI (row 9). Among persons convicted of a DWI and referred to a specialty court, 20.6 percent had a prior arrest for DWI. By contrast, 57.4 percent of those persons referred to a specialty court did (row 9, col. 2).

Of the 1,419 persons referred to a specialty court, 834 enrolled. Before matching, there were substantial differences between the never-referred and enrollment groups (col. 6). The major differences were that persons who enrolled in specialty court programs were much more likely to have had prior misdemeanor charges (59.4% (row 9, col. 5) versus 20.5 percent (row 9, col. 1), and more prior arrests for other misdemeanors (19.4% (row 13, col. 5) versus 7.3 percent (row 13, col. 1)). A much higher percentage of enrolled persons were black (31.7%, row 18, col. 5) than were black in the never-referred group (18.6% (row 18, col. 1). By contrast, the percentage of persons who were Hispanic was much lower in the enrolled than in the new-referred group (11.0% (row 19, col. 5) versus 17.1 percent (row 19, col. 1).

Among enrolled persons, only about half completed a program (416 completed versus 834 persons enrolled). Some standardized differences between persons referred to, enrolling in, and completing a program and persons never referred to a program exceeded 10 percent before matching. After matching, all standardized differences were under 10 percent with one exception. Our failure to obtain a good match for persons of other race in the completion analysis (row 20, col. 10) plausibly reflected the few persons of other race in our data.

5.2. Relationship between enrolling and completing specialty court programs and recidivism during follow-up

Before matching, recidivism rates for the treatment group--enrollment in a specialty court program, were uniformly higher than for the control group (Table 2), which suggests that specialty court programs enrolled persons who were more prone to re-arrest and re-conviction during follow-up. After matching, there were no statistically significant differences in recidivism rates, using a two-year follow-up period.

Comparing persons who completed such programs to persons never referred before matching, completers were much less likely to be arrested on a DWI charge using a two-year follow-up period and the number of DWI arrests was higher for persons never referred (Table 3). However, there were no statistically significant differences with a four-year follow-up period. The results with the two-year follow-up likely reflected the fact that persons who were re-arrested while enrolled in the program were either dropped from the program or received severe penalties for their conduct, which in turn encouraged dropout. After matching, recidivism rates were consistently lower for completers than persons who were never referred in the four-year follow-up analysis. The ATTs imply substantial improvement in outcomes--reductions of slightly over 0.1 in the probability of re-arrest, of

slightly under 0.1 in the number of re-arrests, and of 0.08 in the probability of re-conviction during follow-up. There were no statistically significant differences with the two-year follow-up. These results imply that there are long-term benefits in terms of reduced recidivism among persons who complete specialty court programs.

5.3. Differences in recidivism during follow-up between persons enrolling in and completing DWI versus hybrid drug court programs

The unmatched results imply that persons enrolling in a DWI court are related to a much lower probability of re-arrest and re-conviction than do persons enrolling in drug courts (Table 4, Panel A). After matching, there were statistical differences in recidivism rates by court type on all three outcome measures using the two-year follow-up and on any DWI arrest in the four-year follow-up analysis.

For persons who completed a program, before matching, recidivism was lower for DWI court participants in the two- and four-year follow-up analyses (Table 5). After matching, recidivism was lower for the probability of re-arrest and the number of DWI arrests for completers of DWI court programs. However, with the four-year follow-up, the probability for DWI courts was only lower and statistically significant for the probability of any DWI arrest. The recidivism rates for re-arrests in the two-year follow-up may reflect the winnowing out of reoffenders from specialty court programs. For this reason, more weight should be placed on the four-year follow-up results for comparing outcomes between the two court types. The ATT on the probability of re-arrest during the four-year follow-up is substantial, -0.131 , implying that the re-arrest probability for DWI courts was less than half the probability for drug courts.

6. Discussion

This study of DWI and drug court treatment of persons arrested and convicted on a DWI charge found that completion of specialty programs was associated with reduced rates of re-arrest for DWI with a four-year follow-up period. Enrolling in but not necessarily completing a specialty court program did not reduce such recidivism. Reflecting a national pattern (U.S. General Accounting Office 1997, Belenko 2001), only half of persons who enrolled in a specialty court completed the program. Our results show that specialty courts in North Carolina targeted persons with DWIs who were at higher risk of re-offending. In our study, compared to those who completed a drug treatment court program, completing a DWI court program was associated with a greater reduction in re-arrest for DWI.

Even though our results are promising, only slightly over one percent of this at-risk population was referred to a specialty court. For this reason, treatment court interventions are useful but not a panacea for reducing drinking and driving. Still, these courts accept persons at higher risk of re-arrest for DWI than the vast majority of persons convicted of DWI who are not referred to such courts.

The small share of persons convicted of DWI who were referred to—and the even smaller share who actually enrolled and completed—specialty drug treatment programs raises the question as to why such treatment is so rare. Given their number in absolute terms and their

rapid rate of growth in the United States, it seems unlikely that DWI courts and drug treatment courts face important entry barriers. Moreover, there is no reason to expect that DWI courts face specific entry barriers; rather the low numbers of such courts in the United States more likely reflects the fact that they are relative newcomers. Most of the DWI courts in North Carolina only began in 2010.

Treatment courts are not the only policy option for deterring DWI offenses. A range of public policies have been enacted to address the adverse social consequences of DWI. Such strategies involve a combination of deterrence and incapacitation using license revocation, jail terms, and fines to reduce car crashes and personal injuries. However, the effectiveness of these efforts is hampered because most individuals who disobey substance use and driving laws will not be caught and will not be exposed to the relevant sanctions (Sloan *et al.* 2013). For example, North Carolina mandates that a driver's license be revoked for a minimum of one year following a DWI conviction.¹⁰ In theory, during this license suspension, the individual is incapacitated from committing DWI. Some research has supported this, with effects for pre-conviction license suspensions but not post-conviction license suspensions (Wagenaar and Maldonado-Molina 2007). However, in practice, license suspension fails to prevent many repeat offenders as these individuals continue to drive despite having a suspended license.¹¹

Other public policies aim to improve roadway safety by increasing the price of alcohol and other addictive substances through a combination of excise taxes, minimum drinking age laws, licensure of sellers, and law enforcement to reduce frequency of illegal sales (Ruhm 1996, Carpenter and Dobkin 2009, Cook and Durrance 2012). These laws tend to be similar in the policy regulated (e.g., taxes on alcohol), but vary in the specifics (e.g., amount of excise taxes).

Unlike many of the other policies, treatment courts focus on repeat offenders; seeking to reduce repeat offenses by treating the underlying addictions and offering incentives for maintaining sobriety. Such courts potentially fulfill a backstop function after other public policies have failed to control alcohol dependence and abuse and associated behaviors causing negative externalities. This additional measure focuses on a subpopulation which is unresponsive to other policies. To the extent that they are effective, these specialty courts complement other policies but do not serve as a substitute for them.

Our study has several strengths. First, although more research has been published on effects of adult drug treatment courts than on virtually all criminal justice programs combined (Huddleston and Marlowe 2011), comparatively little research has been published on outcomes following DWI court participation. Second, much research has been conducted on

¹⁰N.C. Gen. Stat. §§ 20.17, 20.19.

¹¹There is evidence that particularly among first time offenders, there is a high rate of driving while license is suspended, but that the quality of the driving may be improved (Mccartt, Geary, and Berning, 2003). In a comparison of 48 one-time DWI offenders with 29 repeat offenders, Cavaola, Strohmets, and Abreo (2007) reported that repeat DWI offenders were more likely to have had a revoked drivers license before the initial DWI offense, and were more likely to have been cited for reckless/careless driving, and have had at least one accident after the initial DWI offense. In a study with a much larger sample, Taxman and Piquero (1998) found similar results in an empirical analysis of recidivism of first-time DWI offenders. Using North Carolina data, no operators license and driving while license revoked were the two most common concurrent traffic offenses (Griffin, Sloan, and Eldred, 2013).

individual court programs in contrast to our study, which used statewide data on all DWI and adult drug treatment courts that reported to the state. Third, we made head-to-head comparisons of effectiveness between DWI and drug courts, to our knowledge the first study to do this. Fourth, the follow-up period in our study (up to four years) was longer than much of the prior research.

We also acknowledge some study limitations. First, this study's outcome measures were solely for DWI re-arrest and re-conviction. These courts may have other favorable outcomes, e.g., reducing alcohol consumption and other forms of substance abuse, increased educational attainment, improved employment status of participants, and better family relationships and educational outcomes of participants' children that should be considered in a full cost-benefit analysis of these programs.

Second, except for persons enrolled in court programs, data on potentially important variables for matching purposes were lacking, including income, educational attainment, family structure, mental health, use of addictive substances, information on preferences and motives for committing DWI or quitting excessive drinking, and prior treatment experience. Matching helped to control for such heterogeneity to the extent that these unobserved characteristics were correlated with the observed variables. However, differences may have remained between groups, even after matching; that is a general shortcoming of observational studies. These unobserved confounders may have biased our results in either direction, depending on their nature and magnitude. For example, in the comparison of completers versus persons never referred to DWI or drug treatment courts, it is possible that persons who lacked self control to abstain from alcohol were more likely to drop out or be discharged from the programs. If so, it is self control rather than the programs per se that is the causal factor. This potential deficiency does not apply to the comparisons between DWI and drug treatment courts since the same selection process to the extent that it existed, would have applied to both groups of persons.

Third, we only measured DWI re-arrests and re-convictions occurring in North Carolina. We lacked data on arrests for DWI involving persons in our treatment and control groups in other states during the follow-up periods. Not using data from other states also raises an issue of external validity of our findings. Fortunately for external validity, adult drug treatment courts in North Carolina were similar to drug treatment courts in other states in that they follow many of the 10 guiding principles of DWI Courts (National Center for DWI Courts 2015).

Fourth, not all specialty courts reported their data to the state. Thus, some arrestees may have been considered not referred when in fact they were referred to non-reporting treatment courts. However, given the relative size of the comparison group prior to matching, this is very unlikely to have affected our results. Fifth, although North Carolina had implemented four DWI courts by year-end 2010, two were implemented in 2009; and, the vast majority of our study's DWI courts observations came from the two DWI courts in Mecklenburg County, the most populous county in the state. The four-year follow-up analysis that compared DWI and drug courts was based entirely on data from Mecklenburg County DWI court observations. Sixth, while we documented that DWI courts were more effective in the

reducing the probability of re-arrest in the short term than were hybrid drug courts, our sample of the latter court type was too small to permit an evaluation of these courts on their own. Seventh, this study shows associations, not causal effects of participation in specialty court programs.

Finally, this is a “blackbox” evaluation in that we sought to detect differences in outcomes during follow-up among groups of persons who differed in their exposure to specialty court programs. Although the administrative data offered several important advantages, such as allowing for consistent coding of exposure to treatment and outcomes, the processes through which the outcomes were achieved were not documented. The courts were subject to common guidelines, but how they actually implemented those guidelines likely varied. Moreover, we cannot know how participant selection affected observed outcomes. Quantitative evidence, such as provided here, should be supplemented by qualitative assessments.

7. Conclusion

In sum, this analysis revealed that participation in DWI court and hybrid drug treatment court programs was associated with a lower probability of re-arrest for DWI, number of DWI re-arrests, and the probability of re-conviction over a four-year follow-up period. Between DWI courts and hybrid drug treatment courts, the reduction in the probability of re-arrest was greater for DWI courts.

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Highlights

- Half of DWI-convicted persons enrolling in DWI and drug courts completed the programs.
- Completing a specialty program was associated with lower re-arrest rates for DWI.
- Enrolling in but not completing a specialty court program did result in a reduction in recidivism.
- DWI court completers were less re-arrest prone than drug court completers.
- Only slightly over 1% of arrestees for DWI were referred to a specialty court.

Descriptive Statistics

Table 1

	Never-Referred Control Group (C) (N=131,340)	Referred vs. Never-Referred (C)		Enrolled (T) vs. Never-Referred (C)		Completed (T) vs. Never-Referred (C)		With Matching ($N_T=N_C=414$)		
		Without Matching ($N_T=1,419$)		Without Matching ($N_T=834$)		Without Matching ($N_T=416$)				
		T (%)	StdDif	T (%)	StdDif	T (%)	StdDif			
Mean (%)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Felony DWI Arrest [*]	0.21	0.28	1.4	3.1	0.24	0.6	0.0	0.24	0.6	0.0
2. Concurrent Offenses										
3. Drug -Felony	0.06	0.07	0.4	0.0	0.00	-3.5	.	0.00	-3.5	.
4. Drug - Misdemeanor	0.69	1.06	4.0	1.4	0.60	-1.1	0.0	0.48	-2.7	0.0
5. Other-Felony	0.26	0.63	5.7	0.9	0.12	-3.1	4.9	0.24	-0.3	7.0
6. Other- Misdemeanor	22.42	20.58	-4.5	-2.4	21.34	-2.6	-0.3	16.59	-14.8	2.0
7. Prior Offenses										
8. DWI Charge - Felony	0.08	0.07	-0.2	0.0	0.12	1.4	4.9	0.00	-3.9	.
9. DWI Charge - Misdemeanor	20.52	57.36	81.6	-0.6	59.35	86.3	2.9	60.58	89.3	-1.5
10. Drug -Felony	0.02	0.07	2.2	0.0	0.00	-2.1	.	0.00	-2.1	.
11. Drug - Misdemeanor	0.27	0.92	8.4	-1.4	1.20	10.9	7.9	1.20	10.9	2.3
12. Other-Felony	0.08	0.49	7.7	2.2	0.36	6.0	4.9	0.24	4.0	0.0
13. Other- Misdemeanor	7.27	18.82	34.8	4.4	19.42	36.3	3.4	15.63	26.4	-0.7
14. DWI Conviction Count [†]	0.13	0.59	83.1	0.4	0.62	87.8	4.6	0.63	92.4	2.5
15. Characteristics										
16. Index Age [†]	32.36	34.75	22.0	-1.6	35.09	24.8	-2.2	36.47	37.1	9.8
17. Female	19.49	20.23	1.8	7.6	20.98	3.7	0.9	20.43	2.4	8.0
18. Black	18.64	31.01	28.9	-2.3	31.65	30.3	-5.1	30.77	28.4	1.6
19. Hispanic	17.14	9.51	-22.6	2.0	11.03	-17.6	3.9	9.62	-22.2	0.0
20. Other Race	1.64	0.92	-6.4	7.1	0.72	-8.5	0.0	0.96	-6.0	14.0

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Notes: T refers to a treatment group, which alternatively is enrolled in or completed a specialty court program. C refers to control, which is always individuals who were never referred to a specialty court program.

* Omitted: Misdemeanor DWI Arrest

$\bar{y}_j$ Mean of continuous variable

Table 2
Average Treatment Effects of Enrolling in a Specialty Court on Two- and Four-Year Recidivism Rates

Panel A: Unmatched Samples								
Two-Year Follow-up ($N_T=834$ $N_C=131,340$)				Four-Year Follow-up ($N_T=583$ $N_C=99,712$)				
	T	C	ATT	t-test	T	C	ATT	t-test
DWI Arrest	0.114	0.091	0.023	-2.25 *	0.221	0.163	0.058	-3.75 ***
Number of DWI Arrests	0.127	0.101	0.026	-2.22 *	0.280	0.196	0.084	-4.13 ***
DWI Conviction	0.102	0.079	0.023	-2.45 *	0.170	0.132	0.038	-2.67 **

Panel B: Matched Samples								
Two-Year Follow-up ($N_T=N_C=833$)				Four-Year Follow-up ($N_T= N_C=582$)				
	T	C	ATT	t-test	T	C	ATT	t-test
DWI Arrest	0.113	0.098	0.014	-0.93	0.220	0.174	0.046	-1.92
Number of DWI Arrests	0.125	0.116	0.008	-0.45	0.277	0.213	0.064	-1.89
DWI Conviction	0.102	0.090	0.012	-0.83	0.170	0.151	0.019	-0.88

Notes: T is for treatment group—here enrollment in a specialty court program; C is for control group—never referred to a treatment court program.

p<0.001
**
p<0.01
*
p<0.05

Table 3
Average Treatment Effects of Completing a Specialty Court on Two- and Four-Year Recidivism Rates

Panel A: Unmatched Samples								
Two-Year Follow-up ($N_T=416$ $N_C=131,340$)				Four-Year Follow-up ($N_T=280$ $N_C=99,712$)				
T	C	ATT	t-test	T	C	ATT	t-test	
DWI Arrest	0.050	0.091	-0.041	2.87**	0.136	0.163	-0.028	1.25
Number of DWI Arrests	0.050	0.101	-0.051	3.05**	0.164	0.196	-0.031	1.08
DWI Conviction	0.065	0.079	-0.014	1.06	0.114	0.132	-0.018	0.88
Panel B: Matched Samples								
Two-Year Follow-up ($N_T=$ $N_C=414$)				Four-Year Follow-up ($N_T=$ $N_C=280$)				
T	C	ATT	t-test	T	C	ATT	t-test	
DWI Arrest	0.051	0.072	-0.022	1.27	0.136	0.239	-0.104	2.96**
Number of DWI Arrests	0.051	0.075	-0.024	1.38	0.164	0.261	-0.096	2.31*
DWI Conviction	0.065	0.065	0.000	0.00	0.114	0.193	-0.079	2.59**

Note s: T is for treatment group—here completing a specialty court program; C is for control group—never referred to a treatment court program.:

p<0.001
**
p<0.01
*
p<0.05

Table 4
Average Treatment Effects for Enrolling in a DWI Court vs. Enrolling in a Hybrid Drug Court on Two- and Four-Year Recidivism Rates

Panel A: Unmatched Samples						
Two-Year Follow-up ($N_T=483$ $N_C=351$)			Four-Year Follow-up ($N_T=332$ $N_C=251$)			
T	C	ATT	t-test	T	C	ATT
DWI Arrest						
0.079	0.162	-0.084	3.70***	0.160	0.303	-0.143
						4.05***
Number of DWI Arrests						
0.093	0.174	-0.081	3.01**	0.202	0.382	-0.181
						3.60***
DWI Conviction						
0.075	0.140	-0.065	3.08**	0.127	0.227	-0.101
						3.23**

Panel B: Matched Samples						
Two-Year Follow-up ($N_T=N_C=274$)			Four-Year Follow-up ($N_T=N_C=181$)			
T	C	ATT	t-test	T	C	ATT
DWI Arrest						
0.073	0.161	-0.088	3.11**	0.182	0.276	-0.094
						2.10*
Number of DWI Arrests						
0.084	0.175	-0.091	2.78**	0.243	0.354	-0.110
						1.66
DWI Conviction						
0.058	0.139	-0.080	3.18**	0.138	0.193	-0.055
						1.41

Notes: T is for treatment group—here enrollment in a DWI court program; C is for control group—here enrollment in a hybrid drug court program.

p<0.001
**
p<0.01
*
p<0.05

Table 5
Average Treatment Effects for Completing a DWI Court vs. Completing a Hybrid Drug Court on Two- and Four-Year Recidivism Rates

Panel A: Unmatched Samples							
Two-Year Follow-up ($N_T=274$ $N_C=142$)		Four-Year Follow-up ($N_T=186$ $N_C=94$)					
T	C	ATT	t-test	T	C	ATT	t-test
DWI Arrest	0.026	0.099	-0.073 3.26**	0.097	0.213	-0.116	2.62**
Number of DWI Arrests	0.026	0.099	-0.073 3.26**	0.108	0.277	-0.169	2.91**
DWI Conviction	0.040	0.113	-0.073 2.87**	0.075	0.191	-0.116	2.92**

Panel B: Matched Samples							
Two-Year Follow-up ($N_T=N_C=107$)		Four-Year Follow-up ($N_T=N_C=61$)					
T	C	ATT	t-test	T	C	ATT	t-test
DWI Arrest	0.009	0.093	-0.084 2.82**	0.082	0.213	-0.131	2.06*
Number of DWI Arrests	0.009	0.093	-0.084 2.82**	0.098	0.262	-0.164	1.90
DWI Conviction	0.037	0.093	-0.056 1.66	0.082	0.164	-0.082	1.38

Notes: T is for treatment group—here completing a DWI court program; C is for control group—here, completing a hybrid drug court program.

p<0.001

**
p<0.01

*
p<0.05