

How Drug Treatment Courts Work

An Analysis of Mediators

Denise C. Gottfredson

Brook W. Kearley

Stacy S. Najaka

Carlos M. Rocha

University of Maryland, College Park

This study examines program elements related to reductions in drug use and crime among Drug Treatment Courts (DTC) participants as well as theoretical mechanisms—increased social controls and improved perceptions of procedural justice—expected to mediate the effects of DTC on these outcomes. Data are from 157 research participants interviewed three years following randomization into treatment and control conditions in the evaluation of the Baltimore City DTC. Findings indicate that perceptions of procedural justice reduce crime and that social controls reduce drug use. Hearings attended, drug testing, and drug treatment reduce drug use. Participation in the DTC increases the number of judicial hearings attended, which directly reduces drug use and indirectly reduces crime by increasing perceptions of procedural justice. Participation in the DTC increases social controls both directly and indirectly by increasing the duration of drug treatment. These increased perceptions of social control reduce drug use. Implications for DTC's are discussed.

Keywords: *drug treatment courts; randomized experiment; mediating effects*

Drug treatment courts (DTCs) were first developed in the late 1980s in response to a justice system overburdened by drug crimes. Various social and political forces during that time (most important the crack cocaine epidemic and the subsequent “war on drugs”) created an environment in which court dockets were overwhelmed by drug cases and prisons were filled to capacity with drug offenders (Belenko 1993; Controlled Substances Act 1988; McColl 1996). Practitioners and reformers, impressed with positive results found in the drug treatment literature (Anglin and Hser 1990; Collins

and Allison 1983; Wish and Johnson 1986), advanced drug treatment as a strategy to deal with the problems of drugs and crime in the United States, and in 1989, the first DTC was instituted in Dade County, Florida (U.S. Department of Justice 1998).

Since that time, DTCs have enjoyed wide support, with the number of courts growing to more than 1,000 nationally (Office of Justice Programs Drug Court Clearinghouse and Technical Assistance Project 2004). Internationally, the DTC model has also been adopted by countries such as Canada, Australia, and the United Kingdom (Harrison and Scarpitti 2002). Much of the existing DTC research and evaluation reports high retention rates and positive outcomes, including criminal justice cost savings and reductions in crime and drug use both during and after programs (Belenko 1998, 1999, 2001; Finigan 1999; Gottfredson and Exum 2002; Gottfredson et al. 2005, 2006; Gottfredson, Najaka, and Kearley 2003; Harrell, Cavanagh, and Roman 1998; Hora, Schma, and Rosenthal 1999; Spohn et al. 2001; Wilson, Mitchell, and MacKenzie 2002).

DTCs share a number of key features, including the prompt identification and placement of eligible offenders, the use of a nonadversarial approach among prosecution and defense counsel, the integration of drug treatment services with justice system case processing, frequent drug and alcohol testing, frequent status hearings with judges, and intensive drug treatment (Drug Courts Program Office 1997). This combination of sanctions, drug treatment, and probation services is expected to reduce levels of substance use and crime as well as improve offenders' integration into the community by enhancing mental and physical health, social connections, and employment.

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Compared with the amount of reasonably high quality research supporting the overall effectiveness of DTCs, there has been little rigorous research conducted on the factors that influence DTCs' outcomes (Belenko 2002; U.S. General Accounting Office 1997). Relatively little is known about the structural and process characteristics of DTCs and how those characteristics relate to successful outcomes (Goldkamp, White, and Robinson 2001a, 2001b; Longshore et al. 2001; Peters and Murrin 1998). Probably the most thorough examination of the relative importance of different drug court elements is a study of drug courts at two sites that assessed the impact of various drug court elements on outcomes (Goldkamp et al. 2001a, 2001b). Indicators of the drug court elements included two measures of participation in treatment, two measures of the assignment of sanctions, and the number of court appearances. Outcome measures included graduation, any type of rearrest, rearrest for a drug offense, and rearrest for a nondrug offense. Analyses controlling for risk-related participant attributes produced findings that were dependent on both sites and outcome variables. Only a handful of studies (reviewed shortly) have examined the psychological mechanisms through which DTCs operate to achieve their outcomes. This study addressed these limitations of DTC research by examining (1) program elements related to reductions in drug use and crime among DTC participants and (2) theoretical mechanisms that might mediate the effects of DTC mechanisms on outcomes. Two such mechanisms, increased social controls and improved perceptions of procedural justice, were examined.

Program Elements

The DTC model was largely shaped by the legal theory of therapeutic jurisprudence. Therapeutic jurisprudence examines the extent to which legal rules, procedures, and stakeholders (i.e., lawyers and judges) produce therapeutic or detrimental consequences for individuals involved in the courts system (Hora et al. 1999; Wexler and Winick 1991). This theory suggests that drug treatment, court monitoring, and criminal procedures are important elements of DTCs. Some research, such as that by Goldkamp et al. (2001, 2001b), has tested the importance of these elements, but this research has produced mixed findings regarding the importance of the different elements of DTCs. Regarding the effects of drug treatment, Peters and Murrin (1998) found that the length of time in drug treatment was significantly related to the number of arrests for both DTC graduates and nongraduates. Gottfredson et al. (2003) compared the Baltimore City DTC participants who received drug treatment with controls and also with those DTC participants

who did not receive drug treatment. The treated DTC participants had significantly lower rates of recidivism at the two-year follow-up than controls or untreated DTC participants. In a survival analysis of the same court, Banks and Gottfredson (2003) found that drug treatment was the only significant predictor of recidivism. Gottfredson et al. (2006) extended these findings by using an instrumental-variables approach to handle the endogeneity problem that arises when participants self-select into different levels of treatment. These more conservative analyses again showed that recidivism was lowest among participants who received more days of certified drug treatment and drug testing.

Other research has suggested that graduated sanctions are also an important element of the DTC model. Harrell et al. (1998) used an experimental design in their study of the DTC in Washington, D.C.. Offenders were randomly assigned to one of three dockets. One docket required drug testing and judicial monitoring. The second docket required drug testing and judicial monitoring but also used a system of graduated sanctions (and participants were referred to treatment if they requested it). The third docket represented the DTC model and included drug treatment (which was poorly implemented), drug testing, and judicial monitoring. The graduated sanctions and DTC programs were independently compared with the "standard" docket. The findings showed that the graduated-sanctions participants were significantly less likely to be arrested in the year following sentencing than the standard-docket participants. Although no significant differences in recidivism were found between the DTC and the standard docket, both the graduated-sanctions and DTC groups self-reported committing significantly fewer offenses than the standard-docket group in all crime categories. Recent research conducted on DTCs in Delaware also suggests that the sanctioning element of DTCs may be important (Marlowe, Festinger, Foltz et al., 2005). This research showed that DTC clients' self-reports of perceived sanctions were related as expected to their DTC outcomes.

However, some of the research on the Baltimore City DTC suggested that graduated sanctions have the potential to be implemented in less than helpful ways. This program comprises two different court programs: one in the district court and the other in the circuit court. Several reports have documented variability in the effectiveness of the two courts, with the circuit court program achieving significantly higher graduation rates (Kearley and Gottfredson 2003) and greater reductions in drug use and crime (Gottfredson et al. 2005). Research into possible explanations for this differential effectiveness found that the way a judge implements sanctions might be an important

predictor of the success of a program. DTCs often use short incarcerations in response to noncompliance to create a specific deterrent and to keep clients accountable for their behavior. Gottfredson et al. (2006) reported that the district and circuit courts differed greatly on their use of incarceration in response to noncompliance. They reported a large difference between the DTC and control participants in days incarcerated for noncompliance in the district court (a difference of 70.6 days) but not the circuit court (a difference of only 7.0 days). In short, incarceration was frequently used as a response to noncompliance in the district court, so much so that after three years, the district court DTC participants had spent more than twice as many days incarcerated as the controls and almost as many days incarcerated as the circuit court DTC participants. This suggests that a high use of incarceration in response to noncompliance may dampen positive DTC effects.

Another major difference between the district and circuit courts was in the number of judicial hearings attended (Gottfredson et al. 2006). Although 84.2 percent of DTC participants attended at least 1 status hearing, a significant difference across courts was observed for the number of status hearings attended. Circuit court DTC participants on average attended 15.0 judicial hearings, and district court DTC participants on average attended 7.4 hearings, suggesting that the number of judicial hearings attended may explain the difference in effectiveness between the two courts. The results showed that the more status hearings attended by participants in both courts, the fewer subsequent arrests were observed, controlling for several important covariates. In a study relating characteristics of the DTC experience with completion of the program for 100 clients, Senjo and Leip (2001) found that the ratio of supportive comments to total comments made during the status hearings by judges predicted program completion, controlling for several background characteristics. However, this research is difficult to interpret because the supportive comments of judges are likely to be in response to offenders' positive behaviors, making it impossible to disentangle these two effects.

Satel (1998) also discussed the need for research regarding the impact of DTC judges. Through interviews with DTC judges and program participants, Satel classified the characteristics of effective DTC judges. These characteristics included the ability to be empathic, knowledge of drug addiction, acceptance of an unconventional role, consistency in applying sanctions, knowledge of the addict community, ability to communicate, commitment to the enterprise, and ability to impose sanctions. In a randomized study of the impact of status hearings, Festinger et al. (2002) compared

a group that met with a judge regularly with another that met with a judge "as needed." Early results showed that clients with prior treatment histories and diagnoses of antisocial personality disorder achieved more weeks of drug abstinence when they met regularly with the judge as opposed to seeing the judge as needed. However, longer term follow-up showed that these early effects did not continue after treatment (Marlowe, Festinger, Dugosh, & Lee 2005).

In summary, although the study of the effectiveness of elements of DTCs is still young, some patterns have emerged. A number of studies, including a few using rigorous, experimental designs, have found that drug treatment plays an important role in DTC outcomes. Graduated sanctions and status hearings may also play a role, but the research regarding these components suggests that their effects may be moderated by the way they are implemented or by the characteristics of the clients.

Theoretical Mediators

Several criminological theories provide theoretical support for the major components of the DTC model. Life-course theory suggests that providing opportunities for "turning points," whether through drug treatment, employment, or strengthening bonds with conventional others, will reduce subsequent crime (Sampson and Laub 1993), and procedural-justice theory posits that the specific behaviors and attitudes of the judge and probation officers involved in a DTC have an important impact on whether an individual successfully complies with the demands of a DTC program (Tyler 1990).

Life-course theory. Social-control variables play a key role in explaining desistance from crime and substance use among adult offenders. As early as 1969, Glaser studied recidivism among parolees and concluded that job instability was linked to criminal recidivism. Several subsequent studies have documented that marriage, parenthood, employment, spousal support, and strong social bonds with conventional are inversely related to crime and substance use (Esbensen and Elliott 1994; Farrington and West 1995; Labouvie 1996; Ouimet and Le Blanc 1996; Shover 1996; Sobell et al. 1993). Helping organize this large body of research, Sampson and Laub (1993) introduced an age-graded theory of informal social control to explain criminal involvement over the life course. Drawing on data from the Gluecks' study of juvenile delinquency and adult crime, they concluded strong social bonds promote desistance from crime, independent of prior delinquent

behavior. More specifically, strong social bonds to the family and labor force were predictive of less crime and deviance among both delinquents and non-delinquents. Laub and Sampson (2003) more closely examined persistence and desistance from crime in relation to the establishment of informal social bonds through employment, family, and the military. They concluded that "men who desisted from crime were embedded in structured routines, socially bonded to wives, children, and significant others, drew on resources and social support from their relationships, and were virtually and directly supervised and monitored" (pp. 279-80).

Although most of the research relating social bonds to desistance from crime and substance use has focused on the importance of family and work as sources of social control, theorists have suggested the importance of other opportunities for encouraging strong social bonds. Sampson and Laub (1993) noted that extended periods of incarceration potentially reduce social bonds and therefore might increase subsequent crime. They recommend that alternatives to incarceration be used with offending populations, especially if these alternatives include elements likely to increase attachments to the social order. DTCs represent such an alternative. A major focus of DTC interventions is to build social bonds with judges, treatment providers, after-care sponsors, and other former drug users who have decided to go straight. The programs also attempt to locate employment and encourage stable home lives for their clients. Offenders who participate in these programs are clearly presented with an opportunity for major life turning points.

Drug treatment is designed in part to increase an offender's personal beliefs that he or she is capable of living a drug-free and crime-free life and to help the offender maintain motivation to remain drug free. Frequent meetings with a DTC judge bolster these internal controls. A supportive relationship with a DTC judge is intended to create a social bond that restrains a client from engaging in drug use or criminal activity because he or she wishes not to lose the judge's respect and support. The relationship with the probation officer is expected to operate in a similar fashion. Of course, several direct controls, in the form of drug testing, the threat of incarceration because of the suspended sentence, and the imposition of graduated sanctions in response to noncompliance also create restraints against misbehavior, more formal in nature. Our first theoretical construct, called social control, combines these related ideas.

Procedural-justice theory. A growing body of evidence suggests that individuals accept or reject the decisions made by legal authorities on the basis of their evaluations of the fairness of the procedures used. The "group-value"

model of procedural justice posits that people want to be treated fairly by authorities, regardless of the outcomes of their treatments. There are six primary components of this model of procedural justice: representation, consistency, impartiality, accuracy, correctability, and ethicality (Paternoster et al. 1997; Tyler 1990; Tyler and Lind 1992). The presence of each component is believed to increase compliance with legal authorities. Representation is the extent to which individuals believe that they had the opportunity to both present their cases to authorities and have their opinions considered. Consistency is the extent to which individuals believe that their treatment was both consistent over time and consistent with treatment received by others. Impartiality is the extent to which individuals feel that they were treated in an impartial and unbiased manner. Accuracy is individuals' perceptions regarding the ability of authorities to make competent decisions on the basis of reliable and valid information. Correctability is the ability of individuals to appeal current decisions to higher level authorities. Finally, ethicality is individuals' perceptions of respectful and dignified treatment by legal authorities.

Studies have examined the role of procedural justice in determining offenders' outcomes. Using a cross-sectional design involving a random sample of Chicago residents, Tyler (1990) analyzed the attitudes of respondents who had recent personal experiences with legal authorities. Tyler found that people were more willing to accept decisions if they felt fairly treated, even if those decisions were unfavorable. More specifically, he found that respondents' views about the legitimacy of legal authorities were highly correlated with perceptions of procedural justice from their recent experiences but were not significantly related to the favorability of the decision.

Paternoster et al. (1997) addressed the concept of procedural justice in a reanalysis of the Milwaukee Domestic Violence Experiment. The researchers examined whether the use of fair procedures by police officers called to the scene of a domestic assault inhibited subsequent assault. They found that when police officers acted in a procedurally fair way, the rate of subsequent domestic violence was significantly lower than when they did not. Furthermore, those suspects who were arrested but perceived their treatment as procedurally fair had subsequent domestic violent rates comparable with those of suspects given more favorable outcomes, such as warnings.

Less evidence is available to support a direct link between perceptions of procedural justice and DTC outcomes. However, during focus group discussions with participants in the DC Superior Drug Intervention Program, Hirst (1999) found that perceptions of procedural justice were important in determining an individual's future drug and crime involvement. Participants

in the study reported that the following elements aided their recovery and compliance: the ability to offer procedural input, knowledge of program and courtroom rules, judicial neutrality, and respectful treatment from both judges and case managers.

Taken together, these studies suggest that fair procedures do play a role in future behavior. However, apart from the above-mentioned qualitative study, the impact of procedural justice in the context of DTCs is still relatively unknown. Similarly, although social-control theories have been tested and shown to provide an explanation for some forms of deviant behavior (Kemp 1993), no research exists on the mediating effects of social controls on DTC outcomes.

This study provided needed information on the mechanisms through which DTCs work by examining the impact of drug treatment, drug testing, suspended sentences, probation, and status hearings on DTC participants' drug use and crime, as well as the mediating effects of procedural justice and social controls. It used data collected as part of an evaluation of the Baltimore City DTC.

The Baltimore City DTC

The Baltimore City DTC¹ was established in 1994, largely in response to a report by the Bar Association of Baltimore City (1990) that estimated that nearly 85 percent of all crimes committed in Baltimore were driven by addiction. Drug court clients are referred from one of two tracks: (1) circuit court felony cases supervised by parole and probation and (2) district court misdemeanor cases supervised by parole and probation. These two tracks are postconviction tracks, whereby clients generally enter the drug court program as a condition of probation.

To be considered for the drug court program, defendants must satisfy several eligibility requirements. They must be at least 18 years of age, they must reside in Baltimore City, and they cannot have any past or current convictions for violent offenses. Once these initial conditions have been met, the process of identifying drug court clients follows several steps. Eligible defendants who express an interest in the program meet with the public defender to discuss their possible participation. If after this meeting the defendants remain interested in the drug court program, record checks are completed and reviewed by the state's attorney. The state's attorney then meets with the public defender to determine which defendants would be best served by the program. Among this subset of defendants, the Psychopathy

Checklist (Hare et al. 1990) is administered to evaluate the offenders' suitability for the program, and the Addiction Severity Index (McLellan et al. 1992) is administered to assess their motivation and need for treatment. Both tests are administered by personnel in the Drug Court Assessment Unit. Data regarding drug histories, medical histories, employment status, as well as other aspects of the defendants' families and social relations are also collected. Upon the completion of these assessments, the assessor recommends the defendants for the program, or not. The names of eligible defendants are submitted to the drug court docket. The state's attorney, public defender, probation agent, and a defendant then appear before the drug court judge to discuss the defendant's case. The judge renders the final decision as to the offender's placement in the drug court program.

Program Components

The Baltimore City DTC program combines intensive supervision, drug testing, drug treatment, and judicial monitoring over the course of approximately two years. All defendants enter the program under intensive supervision. The guidelines of the drug court recommend (1) a minimum of three face-to-face contacts per month between defendants and probation officers, (2) two home-visits per month, and (3) the verification of employment status once per month. In addition, agents frequently verify other special conditions of probation and regularly review their clients' criminal records for recent violations. As defendants near graduation from the drug court program, their levels of supervision are downgraded from "intensive" to "standard high," which requires fewer contacts.

During the course of their supervision, drug court clients are frequently drug tested. Prior to October 1998, the frequency of testing varied depending on clients' test results. All clients were initially required to submit two urine samples per week (referred to as phase I testing). After completing one month with no positive tests, clients generally graduated to phase II testing, in which tests were completed once every week. After two consecutive months of clean tests, clients progressed to phase III testing, during which they were required to complete one urinalysis every two weeks, and continued at this rate for the duration of the program. In October 1998, the testing schedule was revised to reflect a more structured and less individualized schedule. As of that date, all clients are required to provide two urine samples per week for the first three months of the program. During the next three months, tests are completed once per week. Clients are then tested once per month for a period of six months. After that time,

urinalyses are completed randomly for as long as clients remain under drug court supervision.

In addition to supervision and drug testing, drug court program participants are required to receive treatment from one of eight providers located in the city of Baltimore. Three of the programs provide intensive outpatient services, two provide methadone maintenance, two provide inpatient care, and one provides transitional housing. Drug court clients are assigned to a program based on the type of treatment required, the treatment center's availability, and the location of the treatment center relative to clients' residences.

Throughout the program, drug court judges monitor defendants' progress through regularly scheduled status hearings. Defendants are required to attend status hearings once every two weeks. At these hearings, judges review reports from probation agents regarding defendants' compliance with the program. On the basis of these reports, the judges prescribe graduated sanctions as needed. Sanctions usually involve increased contacts with probation agents, increased status hearings, or increased drug testing. Severe violations generally lead to violation-of-probation hearings, during which judges may reimpose the original sentences that were suspended pending the successful completion of the drug court program.

Drug court clients become eligible for graduation after the satisfactory completion of the prescribed treatment and compliance with the requirements of supervision. The decision to graduate a defendant must be approved by the court, the State's Attorney's Office, and the Office of the Public Defender. A graduation ceremony is held to mark the occasion, and defendants' friends and family are encouraged to attend.

Methods

Design

The evaluation of the Baltimore City DTC used an experimental research design. Eligible DTC offenders were randomly assigned to the DTC (treatment condition) or to standard adjudication (control condition). Assignment occurred just prior to the appearance before a DTC judge. The randomization results were given to the judges as recommendations and were followed in most cases because the judges had agreed to participate in the study. Randomization occurred between February 1997 and August 1998, at which time 235 clients had been assigned randomly to one of the two conditions. Study participants were randomly assigned at a ratio of one

treatment to one control for circuit court cases and at a ratio of two treatment to one control for district court cases. This was done at the request of the district court judge, who was concerned that all DTC slots might not be filled if we used a one-to-one ratio. Of the 139 participants randomly assigned to the treatment group, we found records to indicate that 91 percent were actually dealt with in the DTC. In comparison, approximately 7 percent of the 96 participants randomly assigned to the control condition were dealt with in the DTC.²

Tracking and Interviewing

The data used in this study came primarily from interviews with the study participants approximately three years after they were randomly assigned to conditions. All 235 research participants were initially contacted by mail using addresses provided by the Division of Parole and Probation. A variety of additional strategies were used for those participants who either did not respond to the contact letter or did not live at the addresses provided. Project trackers continued to pursue nonresponders by phone, mail, and, with the most difficult cases, home visits. To reach those with incorrect address information, project trackers began by telephone, using directory assistance, reverse directories, and local phone books. Additional tracking methods included information searches of social service agencies, other criminal justice sources, vital statistics records, official and commercial databases, and the Department of Motor Vehicles. Project trackers also attempted to locate research participants by checking homeless shelters, high-drug-area "hangouts," and community treatment centers. When a research participant was located prior to his or her planned interview date (36 months after randomization into the study), a locator form was obtained that included detailed identifying information and other information that would be helpful in relocating the individual. Research participants were paid \$10 for this information.

One hundred fifty-seven research participants were interviewed between February 2000 and November 2001. An additional 15 individuals were confirmed to be deceased. Interviews were conducted in a private area, either in the offices of the Division of Parole and Probation, in jail or prison, or in a community location. The interviews lasted approximately 90 minutes, and individuals were paid \$50 for their participation.

Table 1 reports the total number of research participants interviewed by experimental status and the response rates for each group. Seventy-two percent of the participants in each group were interviewed. Treatment participants were tracked for an average of 97.7 days prior to their interviews, and controls were tracked for an average of 100.2 days. The differences

Table 1
Interview Status by Treatment Condition

Condition	Interviewed	Not Interviewed	Deceased ^a	Total	Response Rate
Treatment	93	37	9	139	71.5 percent
Control	64	25	7	96	71.9 percent
Total	157	62	16	235	71.7 percent

a. Deceased subjects were subtracted from the total when calculating response rates.

Table 2
**Demographic Characteristics and Offense History Data,
 by Interview Status**

	Interviewed	Not Interviewed
Percentage African American	89.2	89.6
Percentage male	74.1	74.0
Age as of February 1, 1997		
<i>M</i>	34.8	34.7
<i>SD</i>	7.5	7.9
Prior arrests		
<i>M</i>	12.0	11.3
<i>SD</i>	8.8	7.1
Prior convictions		
<i>M</i>	5.3	4.6
<i>SD</i>	4.3	3.4

Note: The number of cases was 157 for interviewed and 62 for noninterviewed subjects.

in follow-up rates and tracking days between the two groups were not statistically significant.

Description of Interviewed Participants

The participants included 157 individuals who were interviewed three years after randomization into the Baltimore City DTC study. Table 2 shows the interviewed participants' demographic characteristics and criminal history information at intake. Approximately 74 percent of the sample was male, and 89 percent was African American. The average age among the sample was 34.8 years. The mean number of prior arrests for the sample was 12.0, and the mean number of prior convictions was 5.3. Table 2 also shows that the interviewed and noninterviewed participants were not significantly different from each other on the aforementioned characteristics.

Measures

The interview protocol used in this study drew from existing surveys used in prior evaluations of DTCs, including the Addiction Severity Index (McLellan et al. 1992, as modified for use by Harrell et al. 1998) and the High Intensity Drug Trafficking Areas Life Events Survey. The interview instrument, which combined single items and scales from these sources, included measures of the main outcomes of interest (drug use and criminal activity) as well as the proposed mechanisms (i.e., program services) through which DTCs might work. Potential theoretical mediating variables (i.e., procedural justice and social controls) were also included. The measures of drug use and criminal activity used the past 12 months as a reference period, whereas the measures of program services referred to the past 36 months.

Dependent variables. The three dependent variables used in these analyses included the crime variety scale, the drug variety scale, and the frequency of multiple-drug use scale. The crime variety scale ($\alpha = .70$) combined participants' reports of whether they had committed 10 different crimes in the past 12 months (break-in, theft, auto theft, fraud or forgery, shoplifting, prostitution, robbery, selling drugs, assault, and gun use) to produce a scale whose value was the proportion of the 10 crimes the individuals admitted committing in the past 12 months. Scores ranged from 0 to .40. The drug variety scale ($\alpha = .74$) combined participants' reports of whether they had used any of 13 different drugs or drug types in the past 12 months (alcohol, marijuana, hallucinogens, cocaine, amphetamines, crystal methamphetamine, Quaaludes, barbiturates, tranquilizers, heroin, methadone, other narcotics, and inhalants) to produce a scale whose value was the proportion of 13 thirteen drugs the individuals admitted using in the past 12 months. Scores ranged from 0 to .62. The frequency of multiple-drug use variable was the sum of the number of times an individual consumed multiple drugs, that is, more than 1 drug at a time, during the 12 months prior to being interviewed. This measure was obtained using a monthly calendar in which the participants estimated for each month the number of days and the average number of times per day multiple drugs were ingested. These two estimates were multiplied to create a measure of the number of times multiple drugs were ingested in the past 12 months. Scores ranged from 0 to 5,840. The two drug use measures were selected to represent different aspects of drug use: the drug variety scale provided data on the spectrum of different drugs used, while the frequency of multiple-drug use variable provided data on the frequency with which users engaged in multiple-drug use, which is generally considered to be more dangerous than the use of individual substances.

Independent variables. Five measures of DTC components were examined: days of drug treatment, days of drug testing, days of probation, number of status hearings attended, and days of suspended sentence. Days of drug treatment, drug testing, and probation represented the sum totals for each over the three-year follow-up period on the basis of participants' reports of the beginning and ending dates of each episode of each. For drug treatment, participants were asked for the dates of any of the following types of treatment: residential, methadone maintenance, detoxification, outpatient, Alcoholics Anonymous or Narcotics Anonymous, and other. Days of suspended sentence represented the amount of an offender's assigned sentence that was withheld during his or her participation in the DTC. Number of status hearings was the total number of judicial hearings attended. These latter two measures were taken from official records because they were not included in the interviews.

Life-course theory predicts that events or statuses that bind an individual to the social order, such as marriage and employment, will reduce subsequent criminal activity and substance use. Although our data included measures of employment and marriage, we opted to use participants' subjective measures of social controls rather than these statuses, because our prior reports on these data indicated relatively low rates of both marriage and employment in this population during the follow-up period, with no significant differences between the treatment and control groups (Gottfredson et al. 2005). For this study, we constructed a measure of internal and external controls that we expected would be more sensitive to the DTC intervention. The social control scale used in this study ($\alpha = .89$) combined five questions relating to what motivated an individual to stop using drugs while in the program. The questions asked whether thoughts about the following made a client try to stop using drugs while his or her case was pending or he or she was on probation: the risk of penalty from the judge, the risk of penalty from the probation officer, the desire to show the judge that the client could control drug use, the desire to show the probation officer that the client could control drug use, and the desire to get off drugs for the client's own sake or for the sake of his or her family. Response categories were one for "yes" and zero for "no." A scale was created by averaging these five responses. Scores ranged from zero to one.

The procedural justice scale ($\alpha = .88$) combined 13 items that related to the participants' perceived fairness of the DTC judge and other key stakeholders (Hirst 1999). The items were based on the group-value model of procedural justice, and they included measures of representation, consistency, impartiality, accuracy, correctability, and ethicality. Appendix A shows the items included in the scale. Scores ranged from 1.92 to 4.77.

Four control variables were also examined: race (1 = African American, 0 = other), gender (1 = female, 0 = other), age as of February 1997, and the number of prior convictions. Participation in the DTC was measured with a variable indicating the results of the random assignment (1 = DTC, 0 = control group). Because prior analyses had shown that the outcomes of the program are dependent on the originating court, we also included a control for this (1 = circuit court, 0 = district court).³

Analysis Strategy

All of the study variables were initially checked for skewness. One variable, the frequency of multiple-drug use, was transformed by taking the natural logarithm because it was highly skewed.⁴ Missing data were found to be rare. The percentage of cases with missing data exceeded 5 percent for only one variable: days of suspended sentence (6 percent missing). Several variables (days of drug treatment, drug testing, probation, and suspended sentence) were rescaled by dividing by a multiple of 10 to make the variances across variables more similar. Twelve cases were omitted from the analyses because of extreme outliers, defined as values that were more than three times the interquartile range below the first quartile or above the third quartile. These outliers occurred in measures of drug use and criminal activity. Correlations among all study variables after transformations and rescaling are shown in Appendix B.

The EQS Structural Equations Program (version 6.1 for Windows; Bentler forthcoming) was used to estimate a structural equations model (SEM) of the direct effects of the exogenous factors (DTC participation, originating court, race, age, and gender⁵), the DTC elements, social control, and procedural justice on the three crime and drug use measures; the indirect effects of the exogenous variables on social control, procedural justice, and the three crime and drug use measures; and the indirect effects of the DTC elements on social control, procedural justice, and the three crime and drug use measures. All models were based on the variance-covariance matrix for the transformed and rescaled variables. All cases with complete data were included in each of the SEM analyses. The number of cases in these analyses ranged from 130 to 145.

The final SEM was built in stages because a fully recursive model allowing all paths to be estimated would not run. An initial SEM was run that allowed all paths from the exogenous variables (i.e., the control variables plus DTC participation) to the crime and drug use outcomes to be estimated. This model was improved by deleting paths from the control variables to the outcomes that, according to the Wald test, could be eliminated

without degrading the fit of the model (Kaplan 1995). Models predicting the mediating variables were then developed. The initial equation for procedural justice and social control included all five of the implementation variables as well as all of the exogenous variables. These models were also simplified by deleting paths from the control variables that, according to the Wald test, could be eliminated without degrading the fit of the model. A similar procedure was used to develop models predicting the implementation variables: Initially, all exogenous variables were included, but control variable paths were subsequently deleted according to the Wald tests. The main exogenous variable of interest, DTC participation, was retained in all models.

These initial models were then combined to create the final model. This model included paths from all control variables to all mediating and outcome variables, unless they were constrained to zero in earlier steps. It included paths from all implementation variables to the procedural justice and social control theoretical mediators and to the three outcome variables, unless they were constrained to zero in earlier steps. Additionally, it included paths from procedural justice and social control to the three outcome variables, unless they were constrained to zero in earlier steps. From this model were calculated the total, direct, and indirect effects of each of the exogenous and mediating variables on the three outcome variables.

In all models, preliminary and final, the error terms for the two drug outcomes were allowed to covary. In models containing mediating variables, the error terms for the following implementation variables were also allowed to covary: days in drug treatment with hearings attended and days in drug testing, and hearings attended and days of suspended sentence. The error terms for procedural justice and social control were also allowed to covary. Finally, covariances between the following control variables were estimated in each model: age and African American race, gender and African American race, and age and gender. Several indices of fit are reported for the final model: the ratio χ^2/df (best if three or less), the nonnormed and comparative fit indices (both best if greater than .9), and the root mean square error of approximation (best if .05 or less).

Consistent with prior analyses of the interview data (Gottfredson et al. 2005), we conducted analyses using a $p < .10$ α level as well as the more traditional $p < .05$ and $p < .01$ levels. This strategy was used to balance the concerns of making a type I error with the equally compelling concern of making a type II error. As Lipsey (1998) and others have pointed out, type II error can be particularly damaging in evaluations of public policy, when a program's future may depend on the results of researchers. Given the relatively small number of cases available for analysis and the preponderance

Table 3
Descriptive Characteristics for All Study Variables,
by Experimental Status

	Control (<i>n</i> = 58)		Treatment (<i>n</i> = 87)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Percentage female	18.97	39.54	21.84	41.55
Percentage circuit court	53.45	50.32	44.83	50.02
Age	33.92	7.36	34.89	7.56
Percentage Black	91.38	28.31	93.10	25.49
Number of prior convictions	4.66	3.31	5.16	3.59
Days of suspended sentence	1,028.39	1,216.14	1,394.72	1,395.05
Days of treatment	162.66	302.87	245.86	323.73
Days of drug testing	297.47	395.52	353.31	356.71
Hearings attended	0.64***	2.46	10.59	9.56
Days on probation	460.81*	407.90	569.01	365.62
Procedural justice scale score	3.61**	.73	3.88	.69
Social control scale score	.44***	.38	.64	.40
Frequency of multiple-drug use ^a	2.65*	3.34	1.73	2.68
Variety of drug use	.17**	.14	.12	.10
Crime variety	.09**	.09	.05	.09

Note: The number of cases ranged as follows: total control 54 to 58, total treatment 79 to 87.
 a. Tabled value is the natural logarithm of the raw frequency plus one.

* $p < .10$. ** $p < .05$. *** $p < .01$.

of prior research studies (Wilson et al. 2002) demonstrating positive effects for DTCs, we opted to relax the α levels.

Results

Table 3 shows the means and standard deviations of the study variables (prior to rescaling the variables) for the 145 cases included in the SEM analysis. It shows that, consistent with previous analyses of these data (Gottfredson et al. 2005), the measures of crime and drug use were significantly lower for the DTC clients than the controls. Measures of the two mediating variables, social control and procedural justice, also favored the DTC clients.

Measures of the amount of services received also showed DTC clients receiving more, but these differences reached statistical significance only for the number of judicial hearings attended ($p < .01$) and the number of

days on probation ($p < .10$). Sentences were much longer in the circuit court than in the district court, so the averaged values on the table mask large treatment-control differences in days of suspended sentence within each court. The within-court estimates both show the DTC clients with much longer suspended sentences: 2,471 and 1,722 days for the circuit court treatment clients and controls, respectively, and 397 and 201 for the district court treatment clients and control cases, respectively. These treatment and control differences were statistically significant and practically meaningful.

Prior analyses of official records of days of certified drug treatment showed that the amount of drug treatment days received by DTC clients was lower than anticipated but still significantly higher than the days received by controls. The self-reports, which included other forms of treatment that would not have been picked up in the official records, also showed the DTC clients receiving more treatment, but the p level for the difference ($p < .13$) did not reach statistical significance, and the ratio of treatment to control days was only about half that observed in official records. Official records also showed that the percentage of participants who were drug tested was much higher for the treatment clients (87 percent) than for the controls (40 percent), but the self-reports showed that the difference in the number of days of drug testing, although higher for the treatment clients, was not statistically significant. It should be noted that drug testing was routinely ordered for probationers with histories of drug use, so it is not surprising that control participants would have received so many days of testing.

As expected, none of the demographic or prior crime variables were significantly different for the treatment and control participants.

Structural Equations Model

Tables 4 through 6 show the total, direct, and indirect effects from the final model for the drug use and crime outcomes (Table 4), the program element measures (Table 5), and the theoretical mediators (Table 6). The fit statistics for the final model were as follows: $\chi^2/df = 1.28$, comparative fit index = .96, nonnormed fit index = .93, and root mean square error of approximation = .05. In Tables 4 through 6, blank cells represent paths that were fixed to zero on the basis of Wald test results. Dashes represent paths that were impossible given the model. Figure 1 shows a simplified version of the final model, excluding the paths to and from the control variables and showing only those paths that were statistically significant.

First focusing on the total effects for the drug use and crime measures (Table 4), among the control variables, female participants in this high-risk

Table 4
Decomposition of Effects on Drug Use and Crime

Predictor	Crime Variety			Drug Variety			Multiple Drug Frequency		
	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect
Drug court participation	-.207**	-.166*	-.041*	-.227***	-.077	-.150***	-.129	-.070	-.060*
Circuit court	-.098	-.080	-.019*	-.070**		-.070**	-.087***		-.087***
Female	.207**	.177**	.030				-.008		-.008
Age	.031		.031				.100	.116*	-.015*
African American	-.004		-.004	-.029		-.029	-.170**	-.173**	.003
Days of drug testing							-.150**	-.150**	
Hearings attended	-.037		-.037	-.264***	-.264***				
Days of probation	-.031		-.031						
Days of suspended sentence									
Days of treatment							-.032	-.032	-.032
Procedural justice	-.179**	-.179**					-.063**	-.063**	-.063**
Social control									
R ²	.123			.099			-.214***	-.214***	
							.123		

Note: Table entries are standardized coefficients in the final structural equations model. Blank entries denote paths fixed to zero on the basis of Wald test results. Dashes denote paths not possible according to the model. The model allowed error terms for the following implementation variables to covary: days in treatment with hearings attended and days in drug testing, hearings attended and days of suspended sentence, and days of drug testing and days on probation. The error terms for procedural justice and social control were also allowed to covary, as were the error terms for the two drug use measures.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Table 5
Effects on Drug Court Program Elements

Predictor	Days of				Hearings Attended
	Suspended Sentence	Drug Testing	Treatment	Probation	
Drug court participation	.210***	.077	.120	.130	.567***
Circuit court	.691***	.328***	.242***	.289***	.267***
Female			.132*		
Age			.242***		
African American	-.099*				.108*
R ²	.531	.114	.139	.100	.404

Note: Table entries are standardized coefficients from model described in Table 4.
 * $p < .10$. *** $p < .01$.

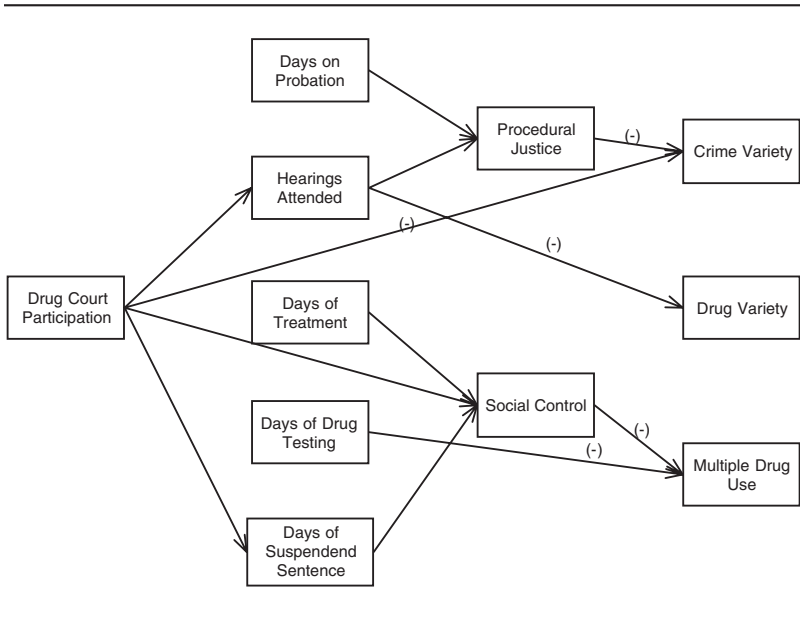
Table 6
Decomposition of Effects on Social Controls and Procedural Justice Perceptions

Predictor	Social Control			Procedural Justice		
	Total	Direct	Indirect	Total	Direct	Indirect
Drug court participation	.224***	.158*	.067**	.232***	.093	.139**
Circuit court	.174***		.174***	.105***		.105***
Female	.039*		.039*	-.169**	-.169**	
Age	.072**		.072**	-.171**	-.171**	
African American	-.015		-.015	.022		.022
Days of drug testing			—			—
Hearings attended			—	.205**	.205**	—
Days of probation			—	.175**	.175**	—
Days of suspended sentence	.148*	.148*	—			—
Days of treatment	.296***	.296***	—			—
R ²	.172			.167		

Note: Table entries are standardized coefficients from the model described in Table 4.
 * $p < .10$. ** $p < .05$. *** $p < .01$.

sample of offenders reported higher crime variety than male participants, African Americans reported less frequent multiple-drug use than individuals of other races, and participants whose cases originated in the circuit court reported lower scores on both drug outcome measures. With these effects controlled, DTC participation significantly reduced the variety of crime and

Figure 1
Mediators of Drug Treatment Court Effects: Simplified
Final Model



drug use. The total effect of DTC participation on multiple-drug use frequency was in the expected direction but did not reach statistical significance, although the indirect effect did. Perceptions of procedural justice reduced crime variety, and social controls reduced multiple-drug use frequency. Among the implementation variables, hearings attended significantly reduced drug variety, while drug testing and drug treatment reduced multiple-drug use frequency.

Next, we focused on the decomposition of these total effects to determine the extent to which the effects of DTC participation were mediated by the implementation and theoretical variables in the model. Table 4 makes clear that the effects of DTC are mediated by the variables in the model, as indicated by the significant indirect effects for all three of the outcome variable. DTC participation had significant direct and indirect effects on crime variety. The direct effect was considerably larger than the indirect effect, suggesting that other important mediators were not included in the model.

Tables 5 and 6 further decompose the indirect effects shown in Table 4. Table 5 shows that DTC participation increased days of suspended sentence and hearings attended, and Table 6 shows that it increased both social controls (directly and indirectly) and procedural justice (indirectly). Table 6 also shows that more days on probation and attending more hearings increased perceptions of procedural justice. This latter link was directly responsible for the DTC's reduction in crime variety shown in Table 4.

The significant effects of DTC on both drug measures were entirely indirect. That is, once the intervening variables were included in the model, DTC participation no longer had a direct effect on either drug use measure. The indirect effects operated differently for the two drug measures. Participation in DTC operated primarily through judicial hearings to reduce drug variety, just as it did to reduce crime variety. But for multiple-drug use frequency, the indirect effect was primarily via increased social controls. Table 4 shows significant total effects for days of drug testing and treatment as well as social controls. Table 6 shows that the effect of DTC participation on social controls was both direct and indirect. The indirect effect came about because both longer suspended sentences and more days of treatment increased subjects' reports of social controls (Table 6).

Other indirect effects of interest include those due to the circuit court. Participants handled in the circuit court as opposed to the district court experienced higher levels of each of the five elements of the DTC. All of these elements had positive effects on the outcomes, either directly or indirectly, as described above. Age had significant direct and indirect effects on multiple-drug use frequency, in opposite directions. Older offenders reported more days in treatment, which reduced drug use both directly and indirectly. But participants also increased their multiple-drug use as they got older. Female participants attended more days of treatment than male participants, and African Americans received shorter suspended sentences but attended more judicial hearings than individuals of other races.

Discussion and Conclusions

Despite evidence that DTCs are effective for reducing crime and substance use and a reasonably strong theoretical basis supporting the inclusion of the different elements of the model, there has been relatively little rigorous research conducted on the factors that actually influence DTCs' outcomes (Belenko 2002; U.S. General Accounting Office 1997). This study addressed this limitation by examining both the specific program elements

related to reductions in drug use and crime and the hypothesized theoretical mechanisms that might mediate the effects of DTC on these outcomes. Two theoretical mechanisms, increased social controls and improved perceptions of procedural justice, were examined.

Consistent with earlier reports from the same study, this study finds support for an effect of DTC participation on crime variety and drug variety. The effect on multiple-drug use frequency is in the expected direction, but the total effect does not reach statistical significance. Several of the implementation variables and theoretical mediators also influence the outcomes as anticipated: Perceptions of procedural justice reduce crime variety, and social controls reduce multiple-drug use frequency. Hearings attended significantly reduce drug variety, while drug testing and drug treatment reduce multiple-drug use frequency. Some of the effect of the implementation variables is direct, and some is indirect through the theoretical mediators.

The following key patterns emerged from the mediator analyses: (1) Participation in the DTC increases the number of judicial hearings attended, which directly reduces the variety of drugs used and also reduces the variety of crimes committed by increasing perceptions of procedural justice, and (2) participation in the DTC increases self-reports of social controls both directly and indirectly by increasing the duration of drug treatment. These increased perceptions of social control reduce multiple-drug use frequency.

Some of the anticipated mediators influence crime and drug use as intended but are not as related to participation in the DTC as expected. Of the five implementation elements, days of drug testing, hearings attended, and treatment days attended affect subsequent crime or drug use. Days of suspended sentence, although having a small positive effect on social controls, do not ultimately influence crime or drug use.⁶ Either the threat of the reimposed sentence does not act as a deterrent or the suspended sentence disposition is effective, regardless of sentence length. More days on probation is also not effective for reducing subsequent crime or drug use, but this is not surprising given that all subjects receive probation sentences, and the variability in length of sentence is not great.

Days of drug testing and treatment do reduce multiple-drug use frequency, but the DTC program does not increase either substantially above what is available to control subjects. In the case of drug testing, this is by design, because all drug offenders were submitted to drug testing. However, the program was intended to increase the level of drug treatment for treatment relative to control subjects. It did, but not to as great a degree as had been anticipated. Note that prior analyses on the basis of official records of certified treatment found a clear program effect on the amount of treatment received (Banks and Gottfredson 2003; Gottfredson et al. 2003, 2006). But in this analysis, based on client self-reports of any type of drug treatment,

the distinction between what the controls and treatment subjects receive is less pronounced. It is interesting to note that this broader array of treatments appears effective for reducing multiple-drug use frequency.

The results suggest that the combination of drug testing and drug treatment provide effective restraints against the frequency of multiple-drug use, and judicial hearings provide effective restraints against both crime (via increased procedural justice) and drug use. These program elements have both direct effects (drug testing and hearings attended) and indirect effects (drug treatment). The indirect effects work by increasing perceptions of social controls (which then reduces multiple-drug use) and increasing perceptions of procedural justice (which reduces crime variety).

Limitations

The data used in this analysis are from a larger study in which individuals were randomly assigned to the treatment and control conditions. Inferences about the effects of DTC participation on the study variables are therefore reasonably high. Nevertheless, some characteristics of the interview study leave room for doubt. The interviews were conducted at one point in time, approximately three years after the start of the study. Measures of DTC implementation variables used a three-year time frame. We know from analyses of official data that most of the services received through the program were received in the first two years of the program (e.g., the average number of days of treatment for DTC subjects was only 18 days longer after three years than after two years of services), so temporal ordering is not a major issue in the interpretation of effects of these variables. However, the causal ordering among the measures of the theoretical mediators examined in this study and the drug and crime outcomes may be questioned. Although we modeled these effects as though the mediators precede the crime and drug use outcomes, it is possible that, for example, reductions in social controls might result from increased frequency of multiple-drug use or that improved perceptions of procedural justice might result from reduced criminal activity rather than the other way around. However, the wording of the questions measuring the theoretical mediators makes this reversed ordering unlikely. The social control items ask respondents to report thoughts that made them try to stop using drugs, and the procedural justice items ask respondents to recall factual information about the conduct of judges, probation officers, and the like from hearings and meetings that occurred earlier. Although possible, it is not likely that changes in drug use or crime in the past 12 months influence these reports.

The study pertains to a specific DTC at a specific point in time during the evolution of that court (beginning at approximately three years after the

program began and extending, for the average participant, for 22 months during which services were provided). DTCs are heterogeneous in terms of the populations served, the points at which they involve offenders (e.g., before trial, after conviction), and the emphasis placed on certain components. Also, as Goldkamp et al. (2001a, 2001b) demonstrated, DTCs evolve over time, and effects are sometimes dependent on the timing of the evaluation study. Our study clearly does not generalize to courts unlike the Baltimore City DTC, and although our prior study of the first year of the Baltimore City DTC (Gottfredson, Coblenz, and Harmon 1997) also found positive results, it is possible that a study conducted on today's court would not. The results also do not necessarily generalize to different client populations than the one studied here. Finally, the relatively small number of cases results in relatively low power, and as a result, small effects may be passed over as nonsignificant.

Policy Implications

The results suggest that three of the main elements of DTCs—drug testing, judicial hearings, and drug treatment—are effective for reducing drug use or crime. DTC practitioners should continue to strengthen these elements of the courts. In particular, they should find ways to increase the length of drug treatment, which was found to be only slightly influenced by participation in the DTC program. In the Baltimore City DTC, subjects handled in the circuit court as opposed to the district court experienced higher levels of drug testing, judicial hearings, and drug treatment, all of which had positive effects on a crime or drug use outcomes. We noted earlier that these two courts differed remarkably in their use of incarceration as a sanction in response to noncompliance, and in the number of hearings attended by the typical DTC client. Further research is needed to fully understand the process and social climate differences across these two courts, but our research suggests that the courtroom dynamics do matter. Organizations operating DTCs would be wise to regularly monitor the main program elements to identify courts whose clients are receiving less than the expected amount of DTC services.

This study represents a preliminary test of DTC mediators. It generally supports the importance of the criminological notions of procedural justice and turning points that serve to increase social controls. More specifically, it suggests that the DTC program, especially the judicial hearings, contributes to an offender's perceptions of fairness and due process, thereby increasing his or her willingness to fulfill his or her part of the negotiated DTC agreement. Furthermore, the results suggest that the internal and external controls provided by the judge, probation officer, and treatment provider act as restraints on offenders' behavior.

Several questions remain for future research, however. The effects of the DTC on crime are only partially mediated by variables in the model. The direct effect of DTC participation is considerably larger than the indirect effect, suggesting that other important mediators have been excluded from the model. Perhaps more elaborated measures of social control and procedural justice or variables from other criminological theories (e.g., self-control, as implied in the general theory of crime, or criminal, drug-using associates, as implied in social learning theory) would help explain this unmediated effect.

Finally, frequent multiple-drug use is more likely to occur among the most addicted segment of the population. The results of this study suggest that drug testing and drug treatment may provide effective restraints for this population, while hearings (a less costly element) may be most important for restraining the drug use of the less addicted of the DTC clientele. Because our data lack high-quality pretreatment measures of addiction status, this issue of differential effects of DTC elements due to individual characteristics must be left for future research.

Appendix A

Items Included in the Procedural Justice Scale

1. Did you or your lawyer have a chance to tell your side of the story when you came to court?
2. Did the judge listen to what you and your lawyer said when you came to court?
3. Did the judge rely on reports from your probation officer or case manager at the court hearings?
4. Was the information the judge had on your drug tests and treatment attendance accurate?
5. Did the judge try to consider all the facts?
6. As far as you know, did the judge apply the rules about going to drug tests and drug treatment the same way for you as for other defendants?
7. Did the judge follow the same rules every time about what would happen if you failed a drug test, skipped a drug test, or did not attend treatment?
8. Were you treated politely and with respect by the judge?
9. Were you treated politely and with respect by your case manager or probation officer?
10. Did you trust the judge to be fair to you in the hearings?
11. Overall, how do you rate the fairness of the courts, probation officers, and case managers in their handling of this case?
12. Overall, how do you rate the fairness of the sentence you received in this case?
13. Overall, how do you rate the fairness of the court in using penalties for using drugs, skipping drug tests, or skipping drug treatment?

Note: Responses to items 1 through 10 ranged from one (*almost never*) to five (*every time*). Responses to items 11 through 13 ranged from one (*not fair at all*) to four (*very fair*).

Appendix B Correlations among Study Variables

	Drug Court Participation	Circuit Court	Female	Age	African American	Number of Prior Convictions	Days of Drug Testing	Hearings Attended	Days of Probation	Days of Suspended Sentence	Days of Treatment	Procedural Justice	Social Control	Crime Variety	Drug Variety	Multiple Drug Frequency	
Drug court participation	1.000																
Circuit court	-.085	1.000															
Female	.035	-.051	1.000														
Age	.064	-.097	-.153*	1.000													
African American	.032	.068	-.239***	.241***	1.000												
American						1.000											
Number of prior convictions	.071	-.024	-.264***	.199**	.042	1.000											
Days of drug testing	.074	.323***	.017	.020	-.068	-.084	1.000										
Hearings attended	.544***	.213*	-.088	.060	.121	.082	.317***	1.000									
Days of probation	.138*	.270***	.066	-.037	-.116	-.062	.478***	.354***	1.000								
Days of suspended sentence	.136	.684***	-.089	-.051	-.027	-.006	.381***	.444***	.330***	1.000							
Days of treatment	.129	.205**	.123	.213*	-.047	-.019	.462***	.350***	.223***	.285***	1.000						
Procedural justice	.187**	.048	-.169**	-.112	-.041	.044	.155*	.319***	.242***	.156*	.130	1.000					
Social control	.243***	.064	-.051	.127	.062	.005	.272***	.311***	.166**	.223*	.342***	.330***	1.000				
Crime variety	-.173***	-.134	.148*	-.104	-.018	-.059	-.096	-.203**	-.071	-.075	-.112	-.201**	-.068	1.000			
Drug variety	-.184**	-.072	-.009	-.017	-.118	.082	-.104	-.305***	-.067	-.065	-.168**	-.104	-.113	.420***	1.000		
Multiple drug frequency	-.152*	-.128	.032	.039	-.177**	.111	-.248***	-.222***	-.170**	-.132	-.191**	-.072	-.284***	.329***	.603***	1.000	

Note: Sample sizes ranged from 130 to 145.

* $p < .10$. ** $p < .05$. *** $p < .01$.

Notes

1. The following description of the Baltimore City DTC is taken with minor revision from an earlier description (Gottfredson et al. 2003).

2. In a previous article, the data used in this study were analyzed by both assigned treatment and by actual treatment received (Gottfredson et al. 2005). These "as treated" results were somewhat more favorable to the program than the "as assigned" results. However, because preexisting differences between the individuals who were and were not treated as assigned rendered the as-treated results somewhat more ambiguous, we chose to use the as-assigned analysis in this article. Both sets of results favored the treatment group.

3. A measure of days incarcerated as a result of the initial arrest was also considered as a control for opportunity time, but this variable had minimal association with either the crime or drug use outcomes or the random assignment variable (all correlations were below .10 in magnitude, and none were statistically significant). More days incarcerated resulted in lower levels of all DTC components, as might be expected. We opted not to control for days incarcerated, because we wished to test the effect of these components without controlling for the reasons why many subjects may not have received the services.

4. The skewness index was 4, and kurtosis was 17. For all other variables (except race), the skewness was less than 2, and kurtosis was less than 7.

5. The number of prior convictions was also examined initially but was removed from the SEM because it was not significantly related to any of the outcomes or mediators examined in the study (see Appendix B).

6. This was also true in a model run only for circuit court cases, for which the length of the suspended sentence was considerably longer than for district court cases.

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Denise C. Gottfredson is a professor in the University of Maryland's Department of Criminal Justice and Criminology. She received a PhD in social relations from Johns Hopkins University, where she specialized in the sociology of education. Her research interests include delinquency and delinquency prevention, particularly the effects of school environments on youth behavior. She has recently completed randomized experiments to test the effectiveness of the Baltimore City Drug Treatment Court and the Strengthening Families Program in Washington, D.C. She is currently directing a randomized trial of the effects of after-school programs on the development of problem behavior.

Brook W. Kearley is a research associate at Social Solutions International. Her primary research interests include the evaluation of drug treatment processes and outcomes, the organization of service delivery systems, and research methods. She has managed several federal- and state-funded studies that examined the efficacy of drug treatment strategies, and she has collaborated on numerous publications related to drug treatment court outcomes, the impact of mediating variables on drug treatment outcomes, and the validity of self-reported drug use and crime. She received her master's degree in criminology and criminal justice from the University of Maryland.

Stacy S. Najaka is the research director of the Maryland State Commission on Criminal Sentencing Policy. She received a PhD in criminology and criminal justice from the University of Maryland. Prior to joining the commission in 2005, She was a research associate at the University of Maryland, where she directed a meta-analytic study of prevention and intervention strategies throughout Maryland, managed a randomized study of the Baltimore City Drug Treatment Court, and assisted Maryland's Division of Parole and Probation in improving the

design and use of its data systems to enhance the supervision of offenders. Her current research interests include program and policy evaluation and research methods

Carlos M. Rocha is a doctoral candidate in the Department of Criminology and Criminal Justice at the University of Maryland, College Park, and a performance analyst with the U.S. Marshals Service. His doctoral dissertation examines the survival rates by treatment modality of offenders randomized into the Baltimore City Drug Treatment Court Evaluation. He is also interested in the experience of Latinos in the criminal justice system and the affects of acculturation on crime.