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Day Reporting Center Completion

Comparison of Individual and Multilevel Models

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This study of 14 day reporting centers demonstrated that findings from analyses that take into account the clustering of clients into programs differ from those that ignore it. The multilevel analysis found that a higher likelihood of completion is associated with being older, White/non-Hispanic, having a current "other" offense, and having emotional problems. Probationers were less likely to complete if they had drug or alcohol problems, primarily criminal companions, and poor living situations. The more time spent in the program and the more contact hours received in employment services were also positively associated with completion. Although a substantial proportion of the variation in the likelihood of completion was found to be due to program-level factors, no specific program characteristics were significant.

Keywords: *day reporting center; multilevel models; evaluation; community corrections programs*

When states implement sentencing laws designed to incarcerate violent and repeat offenders, they may also establish or expand community corrections programs to help protect the public and provide viable rehabilitative programming options. For this approach to be successful, programs must provide services and interventions that are likely to yield positive outcomes and that do not increase risk to the community.

The literature tends to agree that programs that adhere to principles of risk, needs, and responsivity often have positive postprogram outcomes (see Lowenkamp & Latessa, 2005; Sherman et al. 1998). Most of these findings are predicated on the assumption or observation that offenders complete the programs. Although services that reflect these principles are important to positive outcomes, the literature is virtually silent on whether

or how such components affect completion. In light of research findings that those who complete programs have better outcomes than those who do not, an important step in improving program outcomes is improving completion rates (see, e.g., Craddock, 2001; Craddock & Graham, 1996).

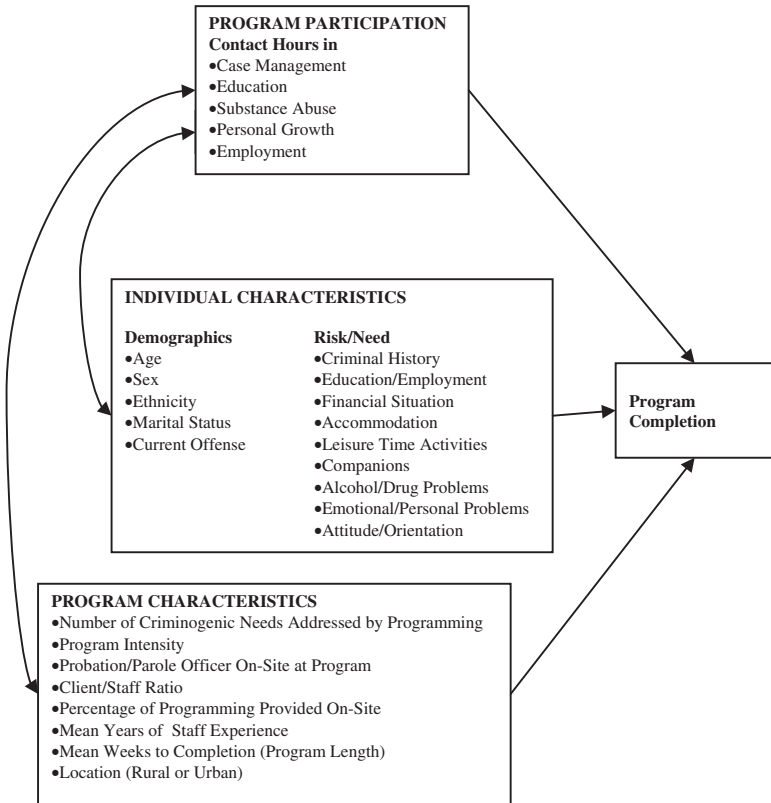
Just as in studies of postprogram outcomes, understanding program completion requires examination of individual and program-level factors. A low completion rate may signal that a program is not appropriate for the population being served or it may imply structural problems within the program (e.g., high staff/client ratio, poorly trained staff, poor relationship with other agencies). A low completion rate may also be related to individual offender characteristics and/or factors operating above the program level (e.g., state policy preventing offenders from participating in certain programs or services).

Most relevant research on program retention and completion is in the substance abuse treatment area.¹ Treatment researchers have long recognized that maximizing retention and completion is important to positive outcomes. One can speculate about why community corrections research has not often addressed the dynamics of program completion, but the fact remains that almost all of the research addresses postprogram outcomes only. To help fill this gap in the research, the present study examines program completion in 14 day reporting centers (DRCs) in North Carolina that provide or broker various types of treatment and other services.²

To address the dynamics of program completion, it is useful to view clients in DRCs much like any other individuals who function within an organization. Within the context of the organization, individual outcomes are always a function of both individual- and organizational-level factors (Hall & Tolbert, 2005). The characteristics, policies, and practices of a corporation shape a work environment, for example, just as they shape the DRC program environment. Programs have behavioral expectations that clients must meet to complete the program, just as companies have behavioral expectations employees must satisfy to retain their jobs; personal characteristics of individuals influence how they perform these activities. (The larger social environment also influences individuals and organizations, but this is not the focus of the present study.)

Figure 1 presents a conceptual model that reflects this approach. The double-headed arrows indicate an expected correlation; single-headed arrows indicate prediction. As illustrated in this figure, a client's personal characteristics (demographic characteristics and risk/need factors) and program participation (measured as contact hours received in various programming areas) predict program completion. These two areas comprise the

Figure 1
Conceptual Model of Program Completion



individual-level measures in the analysis. Organizational-level factors include the characteristics of the program and types of services offered. Program-level factors include the characteristics of the program and types of services offered. The choice of organizational-program-level characteristics is based on findings from the literature on postprogram outcomes, mentioned above. Variation in the first program characteristic listed (criminogenic needs addressed) will yield different components and opportunities for participation and possibly different chances for completion. The other characteristics of the program presented in Figure 1, are not directly related to program offerings and participation but may also affect the likelihood

of completion. Because clients are grouped into different programs, a multilevel analytical approach is appropriate. Given that multisite evaluations of community corrections programs tend to ignore the clustering of these data, it is instructive to compare the results of an individual-level analysis to those of a multilevel analysis.

Rates and Predictors of Community Corrections Program Completion

Completion rates for DRCs vary, but they are generally not high. Parent, Byrne, Tsarfaty, Valade, and Esselman (1995) found an approximately 50% completion rate for a nonrepresentative national sample. McDevitt, Domino, and Baum (1997) studied a DRC that serves offenders released from relatively short incarceration terms in the Boston, Massachusetts, area. Almost 80% self-reported a serious substance abuse problem. Just over half were first offenders. This program had a 66.5% completion rate. Program services included substance abuse treatment with mandatory Alcoholics Anonymous and/or Narcotics Anonymous participation for those with drug or alcohol problems. The program also includes community service, education, random drug testing, and job training and other employment assistance. No data were available on correlates of program completion.

Several other small-scale studies have examined DRCs that serve more serious offenders and are generally of longer duration than the Massachusetts program. An evaluation of the Fairfax County (Virginia) DRC revealed a 54% completion rate among the 244 offenders in the outcome study (Orchowsky, Lucas, & Bogle, 1995). Clients were primarily probationers who violated the terms of their supervision, but some were directly sentenced to the program. The program is operated by the Department of Corrections and includes the types of components often found to be associated with positive outcomes, including substance abuse treatment, life skills, community service, employability skills, and securing of employment. The average time spent in the program for successful completers was about 15 weeks, compared to 8 weeks for noncompleters. The most common reason given for failure to complete the program was continued substance abuse.

A quasi-experimental study of two programs in Wisconsin (one in a rural county and one in a small urban county) designed to serve high-risk and high-need probationers similar to those in the present study found that

61.3% of the 137 clients in the rural county completed the program, as did 41.1% of the 97 clients in the urban DRC. Probation officers in the rural county tended to refer the highest risk probationers to the DRC, whereas in the urban county, probation officers primarily referred their most troublesome supervisees (who also were usually of highest risk and need) to the DRC (Craddock & Graham, 1996).

The first published study of DRCs in North Carolina found a completion rate of about 13.5% (Marciniak, 1999). This program differs from the Massachusetts programs in important ways that can be expected to contribute to a lower completion rate. It is in a relatively small metropolitan county, of 12 months' duration, and aimed at more serious and primarily substance-abusing offenders with prior records—a substantial portion of whom would be prison bound if the DRC were not available. Because the evaluation included consideration of program completion during the early implementation of the program, the instability common in new programs may have contributed to the low completion rate. Statewide, the North Carolina Division of Community Corrections (*North Carolina Department of Correction [DOC], Annual Statistical Report Fiscal Year 2003-2004*, 2005) reported a statewide DRC completion rate of 38% for fiscal year 2003-2004. This overall rate has remained fairly constant since about 1999.

Research on predictors of nonresidential community corrections program completion is rather sparse. An exception is Lowenkamp and Latessa's (2002) study of more than 3,600 offenders in 15 nonresidential community-based correctional facilities in Ohio. These facilities had an overall 79% completion rate. Individual program completion rates ranged from 58% to 93%, and the average time spent in the programs by successful completers was approximately 20 weeks. Logistic regression analysis revealed that offenders who had a prior conviction for a sex offense, were unemployed at arrest, were younger, had a psychological problem, were Black, had a current conviction for a violent offense, and had a prior violation while on community control were significantly more likely to be unsuccessfully terminated from the program.

Program Completion in Relation to Program Participation and Program Characteristics

Program participation is a function of client involvement and program characteristics. Research in substance abuse treatment, in particular, has found that full participation is important to retention and ultimately to

completion (see, e.g., Sung, Belenko, & Feng, 2001). One client who fully participates in a program of low intensity and another who minimally participates in a highly intensive program may have a similar number of program contact hours, however. Very little is known about whether offenders are more likely to complete programs of low or high intensity.

Community corrections research has fairly well established that certain program components tend to result in positive outcomes. The current study measures as many of these components as possible in an effort to determine whether they influence the likelihood of completion, as well. Several meta-analyses and reviews of research on the effectiveness of community-based correctional programs highlight the need to combine punishment with treatment interventions to achieve success generally (Andrews & Bonta, 1998; Cullen, Wright, & Applegate, 1996) and for substance-abusing offenders specifically (Martin & Inciardi, 1993). These researchers discussed the range of characteristics that studies have shown to lead to successful outcomes. Although results have been mixed, some consistencies exist. Probably most important, programs should focus on *assessed* criminogenic risk and needs to address areas of the offender's life that lead to criminal behavior. Moreover, programs that focus on higher risk offenders achieve better results ("the risk principle"). The primary areas are antisocial attitudes and thinking, substance dependencies, criminal peer associations, life skills, and self-control and/or anger management. Treatment should teach the offender strategies to learn to avoid problems associated with criminogenic needs and, ideally, establish means to test these strategies in "real-world" settings. Introspective therapy that aims primarily at self-discovery is not helpful. Also, programs should be designed and staffed by individuals committed to the integrity of the therapeutic regimen. Lowenkamp and Latessa's (2002, 2005) examination of a wide array of community corrections programs in Ohio found that adherence to the risk principle indeed was associated with lower rates of recidivism.

Although the program must focus on criminogenic needs, it should be flexible enough to respond to individual circumstances (Palmer, 1996). It must also provide or broker other services that will enhance the offender's likelihood of success in reducing or eliminating criminal behavior (e.g., housing, education). Research does not recommend specific numbers but reports that such activities are best provided in programs with relatively small caseloads and a low staff-to-client ratio (Bonta, 1996; Gendreau, 1996; Sherman et al., 1998). Researchers focusing on substance-abusing offenders have echoed these findings and have stressed that treatment be of sufficient duration (generally at least 3 months) to have an impact (Prendergast, Anglin, & Wellisch,

1998). Such components can exist in many program structures, but research has not identified an optimum delivery structure. The DRC is a reasonable structure to use to provide these services. This approach may be helpful especially for substance-abusing offenders (McBride & VanderWaal, 1997).

North Carolina Criminal Justice Partnership Program

The present study examines programs established as part of the 1994 Structured Sentencing Act in North Carolina. The overall aim of the law is to reduce the traditionally heavy reliance on incarceration by reserving jail and prison space for violent and repeat offenders and by directing most others to community-based sanctions (Structured Sentencing Act, 1994).

Concomitant with this law, the legislature passed the State-County Criminal Justice Partnership Act to develop a system of community-based correctional programs for offenders who would likely heretofore have been sentenced to state prison. The act facilitated establishment of programs designed to both appropriately punish criminal behavior and provide effective rehabilitation services. Recognizing that the DOC itself and many North Carolina counties historically had little experience with community corrections programs that provide *rehabilitative* services, the act established the Criminal Justice Partnership Program (CJPP) within the DOC. With CJPP guidance, counties established advisory boards to facilitate the interagency cooperation required to develop local policies and programs (Smith, Cummings, & Lensing, 2000).

CJPP reflects scholars' recommendations to reduce the likelihood and extent of net widening by structuring the discretion of judges in determining assignments to community corrections programs (Tonry, 1999). The National Institute of Justice (NIJ) Executive Sessions on Sentencing and Corrections called for this type of system as a mechanism for corrections to advance public safety and help coordinate state and local needs and concerns (Smith & Dickey, 1999). The programs were envisioned as local or state collaborations designed to meet local needs, rather than broad attempts to simply duplicate or import model programs that conventional wisdom dictates may not be appropriate for all localities (Curtin, 1996). CJPP determined that the primary program structure was to be the day reporting center. Some were established within local public agencies, whereas others were established by private non-profit organizations. At every step, the guiding principle was to address local needs as identified by local agencies and then to bring together county and state resources to address these needs.

Sample Selection and Client Data Collection

Because all CJPP programs were fairly new, the study considered only those that had had a consistent flow of referrals for at least 6 months. Programs were selected based on admissions in the 6 months immediately prior to selection. Of the 41 programs, 13 had 10 or fewer admissions, primarily because they had not been operational for the entire 6 months. From the remaining 28 programs, 19 were selected that had fairly consistent admissions from month to month. Finally, 14 were chosen from these to achieve statewide geographic and population (urban/rural) representation.

All clients admitted to these 14 programs from June through December 1997 were asked to be in the study; fewer than 1% refused. The analysis excluded two groups from the original 396 participants. First, 14 clients who did not stay at least 2 weeks in the program were dropped. When evaluating program effectiveness, it is necessary that clients stay a sufficient length of time to receive services. An examination of the hours of programming received per week for those who stayed 2 months or less indicated that the weekly contact hours were similar for clients who stayed at least 2 weeks (and up to 2 months) than for those who stayed less than 2 weeks. These early dropouts received very few hours of programming services. So, 2 weeks appeared to be a natural cutoff point that signaled the beginning of greater than minimal participation in services. Those who dropped out early did not receive sufficient services to be deemed to have been treated.³

The analysis also excluded 18 clients who left the program due to circumstances external to their behavior in the program (e.g., moved to another county, developed severe health problems, probation supervision period ended while in the program) because they would not have had the opportunity to complete or to fail to complete the program. A total of 32 clients were dropped. The final sample for the present analysis included 364 individuals from 14 DRCs throughout the state. All but one program served a single county; the remaining program served a rural six-county region.

Measures of risk of reoffending and need for services came from the Level of Service Inventory–Revised (LSI-R) (Multi-Health Systems, Inc., 1995). The total LSI-R score can range from 0 (*very low risk and need*) to 54. The components of the total LSI-R score cover 10 areas that research has demonstrated to be associated with recidivism: criminal history, education and/or employment, financial situation, family, living situation, use of leisure time, companions, alcohol and/or drug problems, emotional problems, and attitude toward crime and sentence.

The Substance Abuse Subtle Screening Inventory (SASSI) (Miller, Roberts, Brooks, & Lazowski, 1997) provided information on chemical dependency. Data on probation supervision came from the DOC's management information system (MIS). Data on the current offense(s), sentence, and recidivism came from the records maintained by the Administrative Office of the Courts (AOC). Client participation information came from the CJPP's Offender Tracking Record (OTR), which contains information about the services received, results of urine tests, and program completion status. A client is discharged from the program when he or she has completed it (by fulfilling the program requirements) or failed to do so. The case manager indicates on the OTR whether the client completed the program or, if not, enters the reason(s) for a negative discharge.

Client Characteristics

Table 1 presents demographic, offense, and criminal history characteristics for the final analysis sample. It is evident from this table that completers and noncompleters differ significantly on most characteristics measured. Program completers are more likely to be younger, White, high school graduates, married, and of overall lower risk and need than non-completers. Table 1 also outlines the subcomponents of the LSI-R and lists the possible points for each area. LSI-R scores in the study sample ranged from 2 to 43, with a mean score of 21.7. Completers had significantly lower risk and/or need than noncompleters in all areas of the LSI-R except for family situation and emotional problems.

Overall, 45.3% of CJPP clients who stayed at least 2 weeks completed the program. Among clients who failed to complete the program, 65.8% were removed for noncompliance with program requirements or rules, 16.6% absconded, 13.6% had their probation revoked for a new offense or technical violation, and 4% elected to serve their sentence rather than stay in the DRC program.⁴

Program Participation

In addition to characteristics of the individuals themselves, the study collected data on the contact hours each client received in each programming area offered. Also presented are case management contact hours. Table 1 shows the contact hours for completers and noncompleters.

One participation measure important to completion is the rate of positive drug and alcohol tests while in the program. The OTRs showed that among

Table 1
Individual-Level Measures, Client Characteristics,
and Program Participation

Characteristic	All Program Clients (<i>N</i> = 364)	Completers (<i>n</i> = 165)	Noncompleters (<i>n</i> = 199)
Demographics			
Age – mean (median, <i>SD</i>)	27.04 (25, 8.59)	28.66 (27, 9.24)***	25.70 (23, 7.77)
% majority (White, non-Hispanic)	37.36	50.91 [†]	26.13
% male	75.55	73.33	77.39
% high school graduate/GED	34.07	44.17***	26.26
% unemployed	57.42	53.94	60.30
% married	9.62	14.72***	5.58
Risk/need			
% chemically dependent (from SASSI)	57.97	57.05	63.54
Total LSI-R score – mean (median, <i>SD</i>)	21.68 (21, 7.61)	19.84 (20, 7.53) [†]	23.20 (22, 7.34)
LSI-R subscores – mean (median, <i>SD</i>)^a			
Criminal history (0-10)	3.35 (3, 2.17)	3.09 (3, 2.08)**	3.55 (3, 2.32)
Education/employment (0-10)	5.29 (5, 2.64)	4.82 (5, 2.60)***	5.69 (6, 2.60)
Financial situation (0-2)	.95 (1, 1.72)	0.87 (1, .70)**	1.02 (1, .72)
Family situation (0-4)	1.52 (1, 1.18)	1.47 (1, 1.25)	1.56 (1, 1.12)
Accommodation (0-3)	.87 (1, .95)	0.62 (0, .82) [†]	1.07 (1, 1.01)
Leisure time activities (0-2)	1.49 (2, .69)	1.41 (2, .72)**	1.57 (2, .66)
Companions (0-5)	2.74 (3, 1.34)	2.45 (2, 1.42)**	2.98 (3, 1.22)
Alcohol/drug problems (0-9)	3.42 (4, 2.57)	3.21 (3, 2.60)**	3.59 (4, 2.55)
Emotional/personal problems (0-5)	.99 (1, 1.25)	1.10 (1, 1.38)	0.89 (1, 1.14)
Attitude/orientation (0-4)	1.06 (1, 1.21)	0.81 (0, 1.08)***	1.27 (1, 1.28)
Current offense			
% with current felony offense	66.48	64.81	69.19
Seriousness score – mean (median, <i>SD</i>) ^b	5.02 (5.5, 1.75)	5.01 (5, 1.74)	5.04 (6, 1.76)
Current offense category			
% person	18.41	17.90	19.19
% property	31.86	31.48	32.83
% drug/alcohol/ DWI	40.66	38.89	42.93
% public order/other	7.97	11.73	5.05
Program participation			
Contact hours received			
Case management (median, <i>SD</i>)	41.69 (22, 52.10)	56.59 (40, 56.83) [†]	29.27 (14, 44.25)
Education (median, <i>SD</i>)	38.18 (0, 90.07)	35.56 (0, 100.52)	37.87 (0, 80.65)
Substance abuse treatment (median, <i>SD</i>)	53.04 (13, 128.42)	75.17 (24, 178.05)***	34.69 (9, 56.84)
Personal growth (median, <i>SD</i>)	23.79 (0, 39.50)	32.36 (9, 43.65) [†]	16.69 (0, 34.20)
Employment (median, <i>SD</i>)	11.76 (0, 47.85)	17.07 (0, 64.65)	7.36 (0, 26.32)
Weeks in program (median, <i>SD</i>)	26.90 (26, 16.97)	34.56 (30, 16.31) [†]	20.58 (17, 14.79)

Note: SASSI = Substance Abuse Subtle Screening Inventory.

a. These numbers reflect the possible range of scores for each LSI-R (Level of Service Inventory–Revised) subscale. The actual range of scores observed in the study sample was identical.

b. The scale ranges from 1 to 13, ascending in seriousness, and corresponds to the 10 felony and 3 misdemeanor offense classes used in North Carolina.

Significant differences between completers and noncompleters: ****p* < .05. ***p* < .01. [†]*p* < .001.

clients who had at least one positive test for either drugs or alcohol, only 31.5% completed the program, compared with 70.7% who had no positive tests ($p < .001$). According to the OTR data, however, only about 55% of the clients in the sample were tested for drugs or alcohol while in the program. Given the proportion of clients who had no record of drug or alcohol tests, this variable was excluded from the analysis. In addition, the testing procedures were not necessarily random or consistent across or within programs. Information from site visits suggests that more clients were tested than OTRs indicated. In some cases, this may have occurred if clients were tested by a treatment provider that did not report the results of all tests to the DRC.

Program Components and Dimensions

Systematic program-level data came from site visits that included semi-structured interviews with program directors and structured observations of program activities. Protocols contained items on whether the programs addressed LSI-R assessment areas and corresponded to the dominant findings in the literature on components of successful programs.⁵ Table 2 lists program components as they existed at the time of the project site visits. CJPP encouraged counties to design programs based on local needs, but the major components were fairly consistent. Table 3 presents the number of clients enrolled in the program at the time of the site visits, program-level measures used in the multilevel analysis, and program-level characteristics of the study sample.

Program activities and components were rated according to the extent to which they reflected components found to be important to effective programming, but it was beyond the scope of the study to conduct an evaluation of the quality of their implementation and operation.

Intensity Level

Program intensity measures were based on the number of hours per week of available programming. Programs typically had phases with required hours of participation that decreased over time as clients progressed. Programming assignments also varied based on the needs of the client. The final measure of intensity is the maximum number of programming hours per week to which any individual client could have been assigned at any given time. Intensity is not a measure of the number of hours of programming that

Table 2
Program Components and Services

Components	Program													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Substance abuse treatment														
Regular outpatient			.	.				.	.	.	.
Adult intensive outpatient		.	.		.	.	.	.		.	.	.	.	.
Youth intensive outpatient					.								.	
Women's intensive outpatient	.	.		.										
Men's intensive outpatient	.			.										
TASC/E-TASC			.					.						
Drug education	.	.	.			.		
Individual counseling	.	.	.	.			.				.
Personal growth														
Life skills			.	.	.	.		.	.	.	.	.	.	.
Anger management			.	.	.	.	.					.	.	.
Cognitive behavioral training	.	.	.		.						.
Human resource development	.	.	.		.	.		.		.		.	.	.
Parenting			.	.	.						.			.
Education														
GED/ABE	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Health education	.	.	.	.		.	.	.	.	.	.	.	.	.
Employment														
Employment security commission	.	.				.	.	.				.		.
Job placement			.		.			.		.	.	.	.	.
Vocational training													.	.
Vocational rehabilitation	.		.			.		.
Other														
Urine tests		.	.	.	.	.	.	.		.
Transportation	.			.				.						
Other	.					.						.	.
Total programming offerings	14	11	13	11	11	12	5	6	8	6	10	10	9	8

a client actually received; this measure is referred to as “contact hours” and is discussed below. Intensity is a measure of how many hours the program makes available. Contact hours is a measure of the client’s degree of participation in the available programming.

Several considerations entered into this measure. First, a client was normally assigned to only one of several similar programming options (e.g., assignment to either adult or youth intensive outpatient substance abuse treatment, but not both). In these cases, the measure included the hours for only one of these possible assignments. When the hours differed among similar components (e.g., substance abuse treatment), the measure used the highest number of hours.

Table 3
Program Characteristics

		Characteristics at Time of Site Visit										Program Characteristics in Study Sample	
Program	Number of Clients in Program	Intensity Level ^a	Criminogenic Needs Components	Client/Staff Ratio	Staff Qualifications			Location	% On-site Services	% Minority Staff	Number of Clients	Completion Rate (%)	Mean (median, SD) Weeks to Completion
					—Mean (median, SD) Years of Experience	Parole Officer	Probation/Parole						
1	30	L	7	7.5	7.9 (5, 4.1)	No	Rural	57.1	0.0	12	25.0	52.0 (52, 0.0)	
2	19	H	4	9.5	15.0 (15, 15.0)	No	Urban	54.5	33.3	19	26.3	22.2 (13, 25.9)	
3	67	H	6	12.2	5.1 (3, 5.4)	Yes	Urban	100.0	70.0	77	51.9	29.1 (27, 14.8)	
4	32	M	5	10.7	11.0 (16, 7.1)	No	Rural	81.8	33.3	21	52.4	47.1 (50, 11.0)	
5	47	M	7	13.4	9.5 (2, 8.2)	No	Rural	90.9	25.0	14	92.9	52.3 (48, 25.2)	
6	56	H	7	9.3	5.4 (3, 4.6)	Yes	Urban	100.0	66.7	16	31.3	33.8 (37, 10.0)	
7	47	L	3	18.8	9.0 (12, 5.0)	No	Urban	80.0	66.7	22	31.8	29.4 (23, 15.5)	
8	45	M	4	9.0	0.8 (1, 0.5)	No	Urban	83.3	83.0	29	62.1	35.4 (33, 12.0)	
9	30	L	4	20.0	1.5 (2, 0.5)	No	Rural	100.0	25.0	12	58.3	34.6 (35, 7.1)	
10	26	L	3	17.3	1.5 (0, 0.5)	No	Rural	100.0	33.3	13	15.4	27.5 (28, 9.2)	
11	64	H	6	10.7	1.7 (0, 2.4)	Yes	Urban	100.0	75.0	57	47.4	33.4 (32, 9.9)	
12	24	M	6	11.7	3.5 (0, 3.5)	Yes	Rural	40.0	0.0	21	47.6	32.3 (27, 16.7)	
13	35	M	5	11.7	0.0 (0, 0.0)	Yes	Rural	55.6	0.0	20	50.0	33.6 (27, 29.4)	
14	27	H	5	9.0	5.7 (3, 3.1)	Yes	Urban	100.0	66.7	31	22.6	24.1 (27, 5.9)	

a. L = low; less than 10 hours per week of programming available. M = medium; 10-15 hours per week of programming available. H = high; 16 or more hours per week of programming available.

Second, General Equivalency Diploma/Adult Basic Education (GED/ABE) programming and case management were relatively constant across sites. The local community college provided GED/ABE instruction (usually at the DRC) with fairly standard content and mechanisms of delivery. This activity is “constant” in that it would have almost the same number of available programming hours across all programs for any given client. Likewise, case management existed in all programs. Although meetings with the case manager often occurred on a similar schedule for all clients, this service was available on an as-needed basis as well, and most programs had no pre-determined number of hours of case management. Because these requirements were either relatively constant across programs or provided primarily on an individualized basis, they were excluded from the development of the program intensity measure.

Finally, programs did not always have a high degree of internal consistency in scheduling. Some programming options were available sporadically, usually based on either the availability of staff or the existence of a sufficient number of clients at a particular time to warrant provision of the service. This phenomenon was observed in both rural and urban programs.

For the third, fourth, and final situations described above, the analysis used 1 hour per week for each type of service. For example, if a program offered individual substance abuse counseling as needed and job interview preparation instruction as needed, 1 hour was assigned to each component. Although this may underestimate or overestimate the number of hours actually available, the measure is consistent. This calculation was used only when the actual number of hours per week that a person *could* use these services was unavailable.

Because these characteristics of program service provision made it difficult to obtain a precise measure of the number of hours of programming offered per week, the analysis used an ordinal measure of program intensity: Low program intensity is defined as less than 10 hours of programming *available* per week, medium intensity is 10 to 15 hours per week, high intensity is more than 15 hours per week. (The number of hours used in this measure excludes the several hours per week of programming that is constant across programs.)

Criminogenic Needs Components

Several meta-analyses and other studies of multiple programs have identified components associated with successful outcomes, usually reductions in criminal behavior (e.g., Palmer, 1996). It is crucial that programming be

directive and based on principles of behavioral psychology that include a system of rewards and punishments. As clients begin to learn new coping strategies, they must have opportunities to test these new skills in the community. The measure presented in Table 3 is the number of components that address criminogenic needs (Andrews & Bonta, 1998). Descriptions of specific services provided are in Table 2. Components that address criminogenic needs are those that focus on antisocial attitudes and criminal thinking, substance abuse, criminal peer associations, life skills, self-control, anger management, education, and employment. If a program had more than one of the same area of programming, it was counted only once in the measure of criminogenic needs components. For example, offering both intensive and regular outpatient substance abuse treatment was considered to address one criminogenic need area. The study methodology could not ascertain the extent to which the program *formally* included opportunities to test new skills in the community, but anecdotal information from site visits indicated that this was an aspect of all programs. Also, all programs rewarded positive behavior and progress and punished negative behavior, but none used a reward schedule or other verifiable system of graduated (positive and/or negative) sanctions.

Client to Staff Ratio

This measure is the number of clients for each professional staff member. This and all other measures pertaining to staff exclude clerical personnel, volunteers, and professionals who may provide services *at* the DRC but who are not employed *by* the DRC. The professional program staff consists primarily of directors, case managers, and substance abuse counselors. Part-time positions are prorated. Volunteers are excluded because there was no way to accurately track their involvement. Only three programs used volunteers consistently. Two of these programs had about three volunteers each. One used them as GED/ABE tutors, whereas the other used them to help with seminars (e.g., life skills). Only one program (in the largest urban area) used volunteers extensively, primarily to facilitate seminars. The ratio is calculated as the number of clients divided by the number of full-time equivalent professional staff members.

Staff Characteristics

This measure considered the percentage of DRC staff with graduate degrees, years of experience in similar program settings, and whether the

program offered training. Almost no professional staff member had a graduate degree, but almost all had a baccalaureate degree. Staff members in all programs participated in training provided by CJPP. Almost all DRCs offered other types of training, as well. Therefore, educational level and training were excluded from the analysis because they were virtually constant across programs. Even though a number of staff members had experience working with offenders in the community, almost none had prior experience working in a DRC or similar program. Therefore, the final measure of staff qualifications is the mean years of experience in substance abuse treatment and/or community corrections.

Across all programs, 42.3% of the professional program staff members were White, and the remainder were African American. Note that these figures include DRC program staff only. Outside vendors who provide services at the DRC or off-site are excluded.

Another measure is whether a probation or parole officer is located at the DRC. One reason that DRCs exist is to better coordinate services, and coordination with probation supervision is an important aspect of this mission. No direct evidence suggests that this approach is advantageous, but doing so may improve coordination of supervision and other types of services.

Programming Location

On-site programming is considered to be an important advantage, as well as a defining characteristic, of DRCs (Parent et al., 1995). This measure considers services provided by DRC staff, ancillary services, and the location of Probation/Parole Officers (PPOs) on-site. Table 3 shows the percentage of programming options provided on-site and whether a PPO was located at the DRC. It also indicates whether the program is in a rural or urban county.

Program Characteristics of Study Sample

The last three columns of Table 3 show the number of clients in the study from each program and the completion rate for each program (based on data from clients in the study). The final column presents information on the time it took for clients to complete the program.

Programs were designed to last approximately 6 months (about 25 weeks), but providers were free to vary from this length based on client needs and local CJPP Board of Directors policy. Table 1 shows that the average time spent in the program for completers across all programs is 35

weeks, 9 weeks longer than the 6-month target, and the standard deviations presented in Table 3 show that some programs have much more variation than others in the length of time in which individuals actually completed the program.

Modeling Program Completion

It is essential to take into account both individual- and program-level characteristics in the modeling process, because each can independently affect the likelihood of program completion. Individual-level models rely on the assumption that observations are independent of each other. When individuals are clustered into groups (programs), being in one group as opposed to another may itself exert an important influence on the outcome of interest. Reliance solely on individual-level analysis can underestimate the standard errors in many statistical tests, resulting in potentially erroneous findings of significant relationships (Goldstein, 2003; Hox, 2002). Because previous research focuses almost entirely on individual-level analysis of outcomes, it usually ignores the program level. Moreover, individual-level analyses often do not include measures of program participation. The present analysis compares individual-level and multilevel models to illustrate the different results obtained for each (see, e.g., Hoffmann & Gavin, 1998). In both approaches, the outcome of interest is the likelihood of an individual's completion. The individual-level analysis does not adjust for the clustering of the data, whereas the multilevel modeling process does make these adjustments.

To facilitate interpretation, I centered explanatory variables on the grand (sample) mean because my primary interest is in client outcomes. Centering does not lead to different interpretation of parameter estimates from that obtained using raw values, but it is useful for comparison between multilevel models. In a model with grand mean-centered variables, the intercept is the log likelihood of program completion for the typical client, that is, a client possessing characteristics that reflect the mean values of all explanatory variables across programs (Kreft, de Leeuw, & Aiken, 1995).

The analysis process began with an individual-level (fixed-effects) logistic regression analysis and then moved to a multilevel analysis. Preliminary analysis showed that inclusion of both offense type and offense seriousness produced multicollinearity, so only offense category was included. The SASSI yields a dichotomous indicator of drug and/or alcohol dependency, whereas the LSI-R produces a 9-point scale. These two measures had

similar predictive ability, so the LSI-R subscore was chosen because it maintains consistency in the risk and/or need measures. No other variables exhibited multicollinearity. Three LSI-R subscore areas (Financial Situation, Accommodation, Leisure Time Activities) were entered in the models as ordinal variables because of their narrow possible range of scores. I report parameter estimates at the $p \leq .10$ significance level because of the relatively small sample size.

Predictive ability of individual-level models was assessed using the maximum rescaled R^2 statistic produced in SAS (SAS Institute, 2005). It is based on the null hypothesis that all coefficients in the model are 0, but unlike the R^2 statistic in linear regression, it is not a measure of variance explained. Rather, it is a measure of the degree to which the dependent variable is based on the values of the independent variables. It ranges from 0 to 1, with 1 indicating perfect predictive ability. The rescaled R^2 statistic adjusts for the number of variables in the model, so that comparison among models is possible. It cannot, however, indicate whether one model is statistically significantly more predictive than another (Allison, 1999). Any conclusions drawn from this analysis must be tempered by the fact that the sample size does not yield models with a high degree of explanatory power.

To ascertain whether the individual likelihood of completion varies across programs, I estimated a sequence of multilevel models. The analysis used iterative generalized least squares and the penalized (predictive) quasi-likelihood procedure in MLwiN Version 2.02 (Rabash, Steele, Browne, & Prosser, 2004).

First, I estimated a null model containing only the intercept. The variance in this model measures the total between program variation in completion (i.e., without consideration of predictor variables). A zero value indicates no significant variation between programs in the likelihood of completion. In this event, the model would reduce to the individual-level model discussed above, making multilevel modeling unnecessary.

Next, I estimated a random intercept model, which added individual-level characteristics as predictor variables (fixed effects). The variance partition coefficient (VPC) is the measure of intra-class correlation. It is interpreted as the percentage of the total variance in program completion that exists between programs. A high VPC indicates a strong program-level influence on individuals' likelihood of program completion. The VPC for models with dichotomous dependent variables is calculated using the formula from Snijders and Bosker (1999) and is defined as the program-level variance divided by the sum of the program-level and individual-level variance; the individual-level variance is the constant $3.29 (\pi^2/3)$.⁶

Finally, I estimated a random coefficient model to identify which, if any, program characteristics affect the likelihood of completion (controlling for individual-level characteristics). Although multilevel modeling (MLM) is the correct approach when examining the relationship between program characteristics and the likelihood of completion, the current data are far from ideal. MLM is most appropriate when the study includes a minimum of approximately 60 level-two units (Hox, 2002). The current study contains only 14 level-two units (programs). When conducting a multilevel analysis, this situation is analogous to having a sample size of 14 in ordinary least squares regression analysis. Therefore, the multilevel analysis discussed below should be considered exploratory.

Results

Individual-Level Analysis of Program Completion

Table 4 shows the individual-level models estimated. The purpose of estimating several models is to determine whether predictors of completion change when program participation is considered, because studies of community corrections programs do not always include these potentially important factors.

Model 1 in Table 4 includes all individual characteristics presented in the conceptual model. Model 2 contains all variables in Model 1 plus program participation variables. The pseudo- R^2 statistics for these first two models show that the addition of program participation measures not only greatly increased the degree to which the independent variables predict the dependent variable but changed the relationship between some of the independent variables and the dependent variable. This finding highlights the importance of going beyond consideration of personal characteristics in examining outcomes of interest.

Specifically, Model 1 shows several expected findings: Older clients and those who are White/non-Hispanic were significantly more likely to complete the program. Those with more serious criminal histories were significantly less likely to complete, but only at the $p \leq .10$ level. Looking at risk and/or need factors, failure to complete the program was associated with more serious financial problems, more criminal companions, serious problems with accommodation (e.g., living situation, housing) compared to those with no problems in this area, higher levels of substance abuse, and the client's having a poor attitude toward his or her sentence and supervision.

Table 4
Individual-Level Logistic Regression Analysis of Program Completion

	Model 1			Model 2			Model 3			Model 4		
	β	SE	Odds Ratio	β	SE	Odds Ratio	β	SE	Odds Ratio	β	SE	Odds Ratio
Individual characteristics												
Age (logged)	1.88 [†]	.53	6.54	1.83***	.59	6.23	1.83***	.56	6.23	1.69***	.57	5.42
Sex (male = 1)	.03	.34	1.03	.078	.38	1.08	.18	.37	1.20	.01	.36	1.01
Ethnicity (majority = 1)	1.12 [†]	.29	3.06	1.67***	.339	2.91	.95***	.32	2.59	1.20 [†]	.32	3.32
Marital status (married = 1)	.44	.44	1.55	.16	.51	1.18	.22	.49	1.25	.26	.48	1.30
Current felony (Yes = 1)	.03	.29	0.03	.09	.339	1.09	.14	.32	1.15	-.08	.31	.92
Current offense^a												
Person	-.07	.37	.93	-.37	.43	.69	.78*	.43	-.34	.43	2.03	
Drug/alcohol	.51	.38	1.67	.45	.35	1.56	.83	.78	.67	.53		
Other	.54	.51	1.72	1.28**	.55	-.25	.42	2.29	.41	.71	1.95	
Risk/need												
Criminal history	-1.13*	.07	.88	-1.15**	.07	.87	-.16**	.07	.85	-.13*	.07	.88
Education/employment	.02	.06	1.02	.02	.067	1.02	.05	.06	1.05	.02	.06	.98
Financial situation												
Score = 1	.03	.31	1.03	-.47	.99	.01	.34	1.01	-.48	.37	.62	
Score = 2	-.59*	.34	-.01	.35	.63	-.50	.37	.61	.33	.96		
Family situation	.16	.12	1.16	.10	.14	1.10	.11	.13	1.12	.09	.13	1.09
Accommodation^b												
Score = 1	-.19	.31	.83	-.18	.34	.84	-.25	.33	.78	-.04	.33	.96
Score = 2	-.25	.37	.78	-.15	.41	.86	-.19	.83	-.16	.39	.85	
Score = 3	-1.44**	.72	.24	-1.35*	.82	.26	-1.31*	.78	-1.55**	.78	.21	
Leisure time activities^b												
Score = 1	.26	.42	.30	-.03	.47	.97	.14	.46	1.15	-.14	.46	.87
Score = 2	-.29	.30	.75	-.12	.34	.88	-.18	.33	.84	-.11	.33	.90

(continued)

Table 4 (continued)

Companions	-.21**	.10	.81	-.16	.11	.85	-.16	.11	.85	-.20*	.11	.86
Alcohol/drug problems	-.13**	.06	.88	-.16**	.07	.86	-.15**	.07	.86	-.15**	.07	1.17
Emotional/personal problems	.13	.11	1.14	.22*	.13	1.25	.21*	.12	1.23	.16	.12	.89
Attitude/orientation	-.19*	.11	.83	-.11	.12	.89	.16	.12	.85	-.12	.12	1.03
Program participation												
Contact hours received												
Case management				.01**	.00	1.01				.01 [†]	.00	1.00
Education				.00	.00	1.00				.00	.00	1.00
Substance abuse				.00	.00	1.00				.00	.00	1.01
Personal growth				.01**	.00	1.01				.01*	.00	1.00
Employment				.01	.00	1.01				.00	.00	
Weeks in program				.05 [†]	.01	1.05	.06 [†]	.06	1.06			
Maximum rescaled R^2	.29			.46			.43			.39		

a. Reference category is property offense $n = 355$.

b. Reference category is a score of 0 (zero), indicating no problems in the area measured.

When adding CJPP program participation measures (Model 2), some parameters in Model 1 no longer show the same effect. Not surprisingly, age, ethnicity, criminal history, and substance abuse remain significant. Financial situation and companions were no longer significantly related to completion. These changes may indicate that participation mitigates the negative effects of these risk and/or need factors.

Current offense, however, becomes significant when program participation variables are included. Those convicted of an offense in the Other category (composed primarily of public order offenses) compared to the Property category were more likely to complete the program. More than 75% of the clients' offenses in this category were misdemeanors, whereas most offenses in the remaining categories were felonies. It appears that when considering program participation, those with less serious current offenses were more likely to complete the program (controlling for all other factors, including criminal history). This finding contrasts with anecdotal information from site visits in which staff expressed the notion that many referrals with less serious charges seemed to prefer serving a short sentence to participating in a longer DRC program that usually includes closer supervision by a probation officer. The finding suggests that such clients who do enter the program (voluntarily or by court order), however, are more likely to complete.

In terms of program participation, the amount of time spent in the program is the most robust predictor of completion in the area of program participation. Recall that even though the DOC intended the programs to last approximately 6 months, the individual program had the latitude to require longer stays, so this variable is far from constant. When controlling for individual characteristics and weeks spent in the program, the number of contact hours received in case management and personal growth programming (most of which were in the life skills area) significantly increased the likelihood of completion.⁷ The R^2 increased from .29 in Model 1 to .46 in Model 2, indicating a substantial improvement in the ability of the independent variables to predict the dependent variable.

Although the full model (Model 2) contained no multicollinearity, I was interested in determining whether weeks spent in the program could substitute for the entire group of program participation factors. To examine this possibility, I estimated Model 3 and Model 4 in Table 4. Model 3 includes weeks spent in program as the sole measure of program participation, whereas Model 4 includes only the contact hours received in the various programming areas. The R^2 of .43 for Model 3 is very close to that of Model 2 (.46). The R^2 for Model 4 is .39, indicating that inclusion of

contact hours alone does not predict the dependent variable as well as using only weeks in the program as the measure of program participation. It appears that weeks spent in the program can substitute for contact hours with little change in predictive ability of the model. However, the information gained from knowing the types of contact hours that are important to program completion have substantive, though not noticeable, statistical importance when estimating individual-level models.

Multilevel Analysis of Program Completion

The first model estimated, the intercept-only (null) model, shows that 12% of the variance in the likelihood of completion is between programs (see Table 5). Therefore, the likelihood of program completion is not only related to individual-level variables (personal characteristics, risk/need, program participation) but is also related to the particular program in which clients participate.

The random intercept model in Table 5 used the items from Model 2 in Table 4 in a multilevel logistic regression analysis. Its Wald chi-square of 4.61 indicates that it performs significantly ($p \leq .05$) better than the null model. The VPC of .35 represents a substantial increase over the null model, indicating that inclusion of individual characteristics substantially improves the ability to explain the variance in program completion between programs.

After estimating the random intercept model, I entered program-level variables into a random coefficient model. I added each variable individually and examined the model Wald chi-square value to ascertain whether each added variable improved model fit. In most cases, the variable did not change the model chi-square value, whereas in other cases, the model did not converge when the new variable was added. The small number of programs makes it very unlikely for any program-level variable to show a

Table 5
Program-Level Variation in Completion

	Null Model	Random Intercept Model (with individual-level variables)
Variance	0.45	1.76*
Standard error	0.25	0.82
VPC (%)	12	35

Note: VPC = variance partition coefficient.

* $p < .10$.

significant influence on completion. In fact, I found that no program-level variables were significant predictors of program completion.

Therefore, the random intercept model is the final multilevel model in the analysis and is presented in Table 6. Comparing these findings to those in Table 4, program-level variation does not change the effects of age, ethnicity, current offense, accommodation, drug and/or alcohol problems, emotional problems, and time spent in the program, indicating that these characteristics are mostly independent of the influence of program characteristics. When considering variation across programs, criminal history is no longer a significant predictor of completion, and having primarily criminal companions emerges as a significant predictor of failure to complete. Also, in the multilevel model, the number of case management and personal growth programming contact hours are no longer predictive of completion. Only the number of contact hours received in employment programming significantly increased the likelihood of completion.

Discussion

The analysis presented here has two related purposes. Primarily, it examines program completion as an important aspect of program evaluation. In addition, it compares the results of a typical individual-level analysis to those of a multilevel analysis that accounts for the effects of variation across programs on individuals' likelihood of program completion.

The relatively small sample size and measurement issues notwithstanding, the MLM process reveals that ignoring the clustering of the data leads to somewhat different conclusions regarding predictors of program completion from those obtained in an individual-level analysis. What may appear to be an important predictor of completion may instead be an artifact of differences among programs. In a program evaluation, such differences may lead to erroneous conclusions regarding the types of clients who are most likely to complete the program and the types of services that should be provided or enhanced.

The conceptual model (see Figure 1) proposed three areas of influences on program completion: individual characteristics, program participation, and program characteristics. Three major findings regarding these areas are noteworthy. First, examination of individual demographic characteristics shows that minorities, in general, may not be well served by these programs. Even considering risk and need factors and the fact that most programs had a sizable proportion of minority staff members, ethnic minorities were still significantly less likely to complete the program than White/non-Hispanic clients.

Table 6
Random Intercept Model of Program Completion

	β	<i>SE</i>
Individual characteristics		
Age (logged)	1.85***	.68
Sex (male = 1)	.21	.43
Ethnicity (majority = 1)	1.49***	.39
Marital status (married = 1)	.36	.57
Current felony (yes = 1)	-.32	.40
Current offense ^a		
Person	-.59	.48
Drug/alcohol	.48	.39
Other	1.18*	.61
Risk/need		
Criminal history	-.09	.09
Education/employment	.02	.07
Financial situation		
Score = 1	.19	.39
Score = 2	-.18	.49
Family situation	.07	.16
Accommodation ^b		
Score = 1	.43	.38
Score = 2	-.63	.46
Score = 3	-1.98**	.89
Leisure time activities ^b		
Score = 1	.32	.54
Score = 2	.09	.53
Companions	-.24*	.13
Alcohol/drug problems	-.17**	.09
Emotional/personal problems	.25*	.14
Attitude/orientation	-.21	.14
Program participation		
Contact hours		
Case management	.01	.00
Education	.00	.00
Substance abuse	.00	.00
Personal growth	.01	.01
Employment	.01**	.01
Weeks in program	.07 [†]	.01
Wald chi-square	4.61**	

a. Reference category is property offense $n = 355$.

b. Reference category is a score of 0 (zero), indicating no problems in the area measured.

* $p < .10$. ** $p < .05$. *** $p < .01$. [†] $p < .001$.

Second, the risk and/or need area accommodation (living situation) specifically addresses the number of address changes in the past year, whether the client lives in a high-crime neighborhood, as well as factors related to the safety and stability of the client's living situation. Certainly, this score partially reflects the fact that many offenders live in low-income neighborhoods that may also have high-crime rates. Further analysis (not shown) revealed significant interactions among these variables, although their inclusion did not improve model fit. This analysis showed, not surprisingly, that clients who had drug and/or alcohol problems, a poor living situation, and predominantly criminal companions were significantly less likely to complete the program than others.

Given this observation, programs should consider providing more assistance with housing. Although no program listed housing assistance as a specific component, site visit information indicates that case managers routinely addressed clients' housing needs to some degree. Programs may need to be more proactive, though. The inclusion of a supervised housing component for high-risk clients is an option to consider. One program did offer a few clients the option of supervised drug-free housing, but similar services were not widely available elsewhere.

Another aspect of the relationship between drug and/or alcohol abuse and completion may relate to the handling of substance-abusing clients. About 56% of clients who were not chemically dependent (based on the SASSI) completed the program, compared with 46% of those who were chemically dependent (difference not statistically significant). Interviews with program staff in several counties indicated that some local probation offices were less tolerant of relapse to substance abuse than the program staff thought appropriate, based on PPOs' removal of clients from the program for positive urine tests. Substance-abusing clients in such counties may have been less likely to complete the program than similar clients in counties in which the PPOs and the program staff agreed on how to handle positive urine tests. The analysis could not examine this program-level characteristic directly, however.

Third, the finding regarding program participation is instructive. Examination of the results of individual-level models might lead a program to focus on case management and personal growth programming to improve completion rates. When accounting for the multilevel nature of the data, however, these variables are no longer significant. Rather, employment programming is the only component that predicts completion. Employment services chiefly consisted of job placement and job readiness programming. Job training was only offered by two programs (see Table 2).

Examination of the importance of specific program characteristics was hampered by the small number of level-two units (programs). Standard MLM techniques showed that although a fairly substantial amount of the variation in the likelihood of completion is related to characteristics of the program, it did not appear that any of those measured were important. If these results are to be accepted, then I would conclude that the program characteristics that research has shown to be important to recidivism (primarily those that address criminogenic needs) are not important to completion. However, other program characteristics measures were likewise not significant. However, it is just as likely that the finding reflects the small sample size.

In summary, this study has demonstrated the importance of personal characteristics, program participation, and program characteristics to DRC completion. Future research that includes a larger number of programs may shed more light on these relationships through a more detailed examination of these factors than was possible in the present study.

Notes

1. Retention is defined as the length of time a client spends in a program from admission to (successful or unsuccessful) discharge.

2. The present analysis is part of a larger study that addressed recidivism of program clients and two comparison groups of probationers, but this article considers program completion only.

3. Concern may exist over whether the clients who dropped out early differ from those who did not. Bivariate analysis of the two groups showed no significant differences in age, race and/or ethnicity, sex, offense seriousness, Level of Service Inventory-Revised (LSI-R) scores, or chemical dependence.

4. Criminal Justice Partnership Program (CJPP) programs were intended to target offenders who need more services and intervention than probation supervision alone provides. The similarly situated comparison group of probationers in the larger study had a mean LSI-R score of 16.2 (median = 16, $SD = 6.65$). Scores differed significantly ($p < .001$) between the clients and the comparison group (Craddock, 2001). Based on this difference, it appears that the CJPP programs generally reached their target population.

5. The original project design included administration of the Correctional Program Assessment Inventory (CPAI), to assess programs based on characteristics found to predict successful outcomes (Gendreau & Andrews, 1996). This instrument was being revised and was not available for use during this study (P. Gendreau, personal communication, March 12, 1999).

6. The variance partition coefficient can also be interpreted as the extent to which the likelihood of completion is more similar among clients in the same program than among clients across all programs.

7. I also estimated a model with interaction terms. Although three interactions were significant, the R^2 increased by .01, indicating that the two models were virtually identical in predictive ability. Therefore, I chose to interpret the main effects model only.

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