INCREASING THE EFFECTIVENESS OF CORRECTIONAL PROGRAMMING THROUGH THE RISK PRINCIPLE: IDENTIFYING OFFENDERS FOR RESIDENTIAL PLACEMENT*

CHRISTOPHER T. LOWENKAMP
EDWARD J. LATESSA
  University of Cincinnati

Research Summary:

   This study analyzed data on 7,306 offenders placed in 1 of 53 community-based residential programs as part of their parole, post-release control, or probation. Offenders who successfully completed residential programming were compared with a group of offenders (n = 5801) under parole/post-release control who were not placed in residential programming. Analyses of program effectiveness were conducted, controlling for risk and a risk-by-group (treatment versus comparison) interaction term.

Policy Implications:

   Significant and substantial differences in the effectiveness of programming were found on the bases of various risk levels. This research challenges the referral and acceptance policies and procedures of many states' departments of corrections, local probation departments and courts, and social service agencies that provide offender services.

KEYWORDS: Risk Principle, Community Corrections, Halfway House, Treatment Interaction

   Historically, community corrections staff have preferred to work with low-risk offenders because they are much easier to manage than are high-

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risk offenders (Bonta, 2000; Wormith and Olver, 2002). This preference has been observed in other professional arenas and persists despite the knowledge that indicates the opposite is desirable. In 1964, for example, Schofield described psychotherapists' inclination to select Young, Attractive, Verbal, Intelligent, and Successful (YAVIS) patients. However, patients who were the easiest and most satisfying to serve needed help the least. Schofield's observation also applies to low- and high-risk offenders. Low-risk offenders have few serious problems, are invested in prosocial institutions, and exhibit mostly prosocial behaviors. In contrast, high-risk offenders have substantial problems in multiple areas, little motivation to change, live in criminogenic environments, and engage in a wide range of antisocial behaviors.

Andrews et al. (1990a) discussed four principles that guide the effective assessment of and treatment of offenders: risk, need, responsivity, and professional override. Although each of the four principles is important to offender assessment and treatment, the risk principle deserves special attention as it guides the first step in the correctional process: Deciding who to target for correctional interventions.

Simply put, the risk principle states that the intensity of services and supervision should be matched to the level of offender risk.[1] The principle calls for focusing resources (both financial and human capital) on high-risk cases. Although higher risk offenders sorely need interventions, they are often the first to be excluded from programming (Gordon and Nicholaichuk, 1996). Nonetheless, it should be the case that the intense correctional interventions be *reserved for the high-risk offenders*. Failing to match risk with intensity of services can diminish public safety, waste correctional resources, and increase the probability of criminal behavior among low-risk offenders.

Many meta-analytic reviews that have investigated the link between risk level and program effectiveness have reported that correctional programs are more likely to have an effect when they are delivered to higher risk offenders (Andrews and Dowden, 1999; Andrews et al., 1990b; Dowden and Andrews 1999a, 1999b, 2000). However, meta-analyses are limited in their ability to fully investigate the interaction between offender risk and program effects. We designed this study, using data on over 10,000 offenders served by 53 community-based residential facilities, to overcome those limitations. More specifically, we investigated whether program effectiveness differed according to offender risk as predicted by the risk principle. In addition, our findings can assist in developing policies and procedures that guide the placement of offenders in programs and lead to a more effective and efficient use of community corrections' resources. Finally,

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1.   Risk refers to the likelihood of one engaging in subsequent criminal behavior.

our research provides results that can inform future studies in community corrections that examine the use of offender risk assessments and treatment.

PREVIOUS RESEARCH

Two major questions should be considered when reviewing the research on the risk principle. The first question is as follows: Which offenders does the risk principle dictate we target and what happens when we fail to target them? The second question is as follows: How has research informed our understanding of the risk principle and its implications for correctional interventions including predictions about offender by treatment interactions?

IATROGENIC EFFECTS

A major concern that develops from the risk principle is the potential harm that can occur by exposing low-risk offenders to intensive correctional interventions. This concern can also be thought of as countervailing risk or iatrogenic effects (Weiner, 1998). Iatrogenic effects refer to illnesses and injuries acquired during medical treatment for a primary ailment. Conceptually, iatrogenic effects can be applied in many contexts (Weiner, 1998), including correctional interventions (Dishion et al., 1999). Iatrogenic effects in corrections might occur when a low-risk offender is placed on a supervision level or in a correctional program that exposes the offender to high-risk offenders or disrupts the low-risk offender's prosocial ties and contacts in the community (Andrews and Bonta, 1998; Dishion et al., 1999). Of equal importance, but not directly related to the current study, iatrogenic effects in corrections might also occur when a sound intervention is poorly implemented or improperly delivered to a moderate- or high-risk offender (Barnosky, 2004; Lowenkamp, 2004). Although theoretically sound, these arguments are largely empirical questions. To evaluate the level of empirical support for iatrogenic effects in correctional settings, we review selected meta-analyses.

RESEARCH ON THE RISK PRINCIPLE

Andrews et al. (1990b) conducted a meta-analysis of 80 studies on correctional interventions. The research coded programs as "sanctions," "inappropriate," "unknown," or "appropriate" (for a detailed description of these categories, see Andrews et al., 1990b). To be labeled appropriate, an intervention, among other things, had to focus on higher risk cases. Andrews et al. noted that appropriate programs were by far the most effective. Andrews and Bonta (1998) used data from the Andrews et al.

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study and additional studies to analyze the effects of program characteristics by examining the risk principle. They found that programs that focused on higher risk offenders were five times more effective in reducing recidivism than were programs that focused on lower risk offenders (risk is assessed by the percentage of offenders with a prior record).

In a meta-analysis of 200 studies on serious juvenile offenders [drawn from Lipsey's (1992) study], Lipsey and Wilson (1998) investigated the relationship between participants' risk level and program effectiveness in reducing recidivism. The authors found a significant increase in program effectiveness when the samples consisted of juveniles with mixed records (violent and nonviolent) compared with nonviolent only, and when the entire sample had a criminal history, compared with most of the sample having a criminal history. Lipsey and Wilson (1998:338) concluded that their data supported ". . .the truism that there must be potential for bad behavior before bad behavior can be inhibited."

Andrews and Dowden (1999) investigated the effects of the risk principle in a review of correctional programs (45 effect sizes from 26 studies) that serve predominantly female offenders. A study was categorized as dealing with high-risk cases if most cases in the sample had either a previous record or had penetrated the justice system at the time of the study (i.e., had police contact but no adjudication or disposition). The results of the analyses (reported in Dowden and Andrews, 1999a) showed that programs that failed to adhere to the risk principle increased recidivism by 4%, whereas those that adhered to the risk principle decreased recidivism by 19%.

The relationship between the risk principle and reoffending for juvenile and violent offenders was examined in two similar meta-analyses. With young offenders (229 effect sizes from 134 studies), Dowden and Andrews (1999b) reported that programs adhering to the risk principle were four times more effective (12% reduction versus 3% reduction) in reducing recidivism than were programs that failed to adhere to the risk principle. Applying the risk principle to violent reoffending (52 effect sizes from 35 studies), Dowden and Andrews (2000) found no difference between programs that did or did not adhere to the risk principle (9% versus 4% reductions, respectively).

Two other meta-analyses focused on the effects of school-based intervention programs in reducing delinquent behavior by youth. The first meta-analysis by Wilson et al. (2001) reviewed the findings of 165 studies of school-based intervention programs for reducing conduct problems. This study found that programs that targeted high-risk populations were

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nearly three times more effective than were those that targeted the general school population. The authors concluded that school-based interventions should be behavioral and target higher risk students rather than the general student population.

The second study, conducted by Wilson et al. (2003), investigated the effects of school-based intervention programs on aggressive behavior. Wilson et al. (2003) identified 221 studies for the meta-analysis. The authors examined findings based on the risk level of the sample in the study. Four categories of risk were created and used for subanalyses. These four categories were as follows: (1) indicated (children who had already demonstrated aggressive behavior); (2) selected individual (children who were higher risk because of individual personality characteristics or traits); (3) selected environment (children who were at higher risk because of living in high-crime neighborhoods); and (4) general population samples (a wide range of children in terms of risk). The effect sizes, which indicated reductions in aggressive behavior, were related to the risk level of the sample. The largest effect sizes were found for studies with indicated samples, followed by selected (individual), selected (environment), and general population samples. The average effect size for indicated samples was four times as large as the effect size for general population samples. The impact of risk on effect size persisted even after controlling for other relevant variables in a multiple regression model.

Finally, a meta-analysis conducted by Lowenkamp et al. (2003) revealed a trend that was similar to the ones reported in the aforementioned studies (Andrews et al., 1990b; Dowden and Andrews 1999a, 1999b; Wilson et al., 2001; Wilson et al., 2003). In this meta-analysis, the authors reviewed the effectiveness of drug court programs in reducing recidivism. Analyses revealed that, overall, the programs reduced recidivism by 7.5%. However, when examining the average effect size by risk level of the sample (50% or more with a record versus less than 50% with a record), the investigators found that the effects increased to 10% in studies that had high-risk samples and decreased to 5% for studies that had low-risk samples.

SUMMARY

Research findings overall provide considerable support for the notion that correctional interventions should target at-risk offenders. However, the measure of risk used in meta-analyses is usually defined by the percentage of the sample with a criminal history. Furthermore, meta-analyses are limited by the information contained in the primary studies and therefore fail to provide detailed information about the interaction between risk and treatment. That is, meta-analysts can rarely separate the effects of programming on high-risk versus low-risk offenders. The large number

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of offenders and programs covered in the current research allows for such an investigation.

METHODOLOGY

The current study involved a quasi-experimental design that examined the effects of correctional programs on parolee and probationer recidivism. A total of 53 programs were included in this research. A difference in the recidivism rate between the experimental and comparison group was calculated for each program. Differences in recidivism rates were also calculated for each risk category of offenders.

PARTICIPANTS

This study involved an experimental and a comparison group. The experimental group included offenders released from a state institution, on parole, post-release control (PRC), or transitional control[2] and placed in a halfway house (HWH), or offenders sentenced to community-based correctional facilities (CBCF).[3]   The total number of offenders in the experimental group was 7,366; 3,629 were in the CBCF group, and 3,737 were in the HWH group. These offenders were compared with a group of parolees/PRC released from Ohio Correctional Institutions during the same fiscal year without placement in a HWH or CBCF. The comparison cases (n = 5,855) were drawn from a sampling frame (n = 6,781) and were matched with the experimental cases on county of supervision and gender. Cases were further matched on the numbers of sex offenders in each group. In some instances, there were not enough cases for a one-for-one comparison, and therefore, some comparison groups were smaller than the experimental groups.

Although we conducted analyses that compared the entire treatment group, regardless of termination status, to the comparison group, the main analyses reported here included only those offenders who were successfully terminated from a correctional program. This limitation resulted, in

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2. Parole and post-release control are both periods of supervision served by offenders after their release from prison. However, the two differ in that post-release control cannot be used as an early release mechanism and applies to offenders who committed crimes on or after July 1, 1996 and are subject to Truth in Sentencing Legislation. Transitional control includes supervision of inmates that would have formerly been released under furlough, conditional release, or electronically monitored release.

3. Community-based correctional facilities are four- to six-month programs that take offenders sentenced directly from the court. These offenders on probation, however, are higher risk than are typical probation samples (see Latessa et al., 1997). In the current sample, the CBCF treatment group scored significantly higher on our measure of risk compared with the parolee treatment and comparison groups.

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most instances, in the comparison group being larger than the experimental group. We excluded unsuccessful terminations because we believe that it is logical and appropriate to focus on the effects of treatment only after an individual is exposed to the entire treatment experience. We would not expect medical treatments to be as effective if a participant dropped out of treatment halfway through an experimental trial. Likewise, we would not expect a correctional intervention to be as effective when an offender is only exposed to half of the treatment. Furthermore, our decision to exclude unsuccessful terminations was driven by the fact that such terminations from a halfway house or CBCF usually lead to incarceration for technical violations and a prima facie relationship with outcome. Regardless, individual differences among the successful terminations and the comparison group participants that might have developed from the expulsion of the unsuccessful terminations were controlled for in the multivariate models. In addition, to determine the extent to which these groups differed on key constructs, we compared them on demographic and risk factors. We also conducted multivariate analyses that predicted various outcomes using all program participants regardless of termination type.

MEASURES

Individual-level predictors for both the comparison and experimental groups included race, gender, age, marital status, employment status at arrest, a history of problematic alcohol use, a history of drug use, mental health problems, and criminal history. Measures of criminal history included number of arrests and incarcerations and whether the offender had any previous probation or parole violations.

Demographic data included age, race, sex, and marital status. Age was recorded as the actual age in years, race was coded as white or black, and marital status was coded as married, never married, or divorced/separated/widowed. Criminal history data were based on the number of previous arrests and incarcerations. These data, for the purposes of creating a measure of risk, were collapsed with zero representing no arrest or incarceration, 1 representing at least one arrest or incarceration, and 2 representing 2 or more arrests or incarcertaions.

Data on offender needs and current offense included employment status at arrest, educational level, history of problematic alcohol use, history of drug use, a history of or current mental health problems, type of current offense, and felony level. Employment at arrest was coded as (0) for employed and (1) if unemployed. Education level was coded as the actual grade completed, and a second measure captured high school (H.S.) completion (coded 0 for H.S. graduate and 1 if the individual had not completed H.S.). A history of drug use, a history of problematic alcohol use,

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and a history of or current mental health needs were all coded as 1 if the characteristic was present and 0 if absent.

The variables measuring alcohol use and drug use were coded based on information recorded in pre-sentence investigations, program files, or other documentation. Specifically, an individual would be coded as having a drug or alcohol problem if such a problem was noted in the file, a history of drug or alcohol related arrests, or a diagnosis for alcohol or drug abuse or dependence. The variable measuring mental health needs was coded as 1 if file information indicated concerns over mental stability and daily functioning (e.g., suicide attempts, depression, anxiety) or if there was a diagnosis of a mental health problem. Finally, offense type was coded as a personal, sex, drug, property, or other type of crime, and felony level was coded from 1 to 5. First-degree felonies were the most severe, and fifth-degree felonies were the least severe.

Risk was based on a review of risk predictors and risk assessment instruments (Andrews and Bonta, 1995, 1998; Baird, 1991; Cottle et al., 2000; Gendreau et al., 1996; Hoffman, 1994; Hoge and Andrews, 1996; Jones-Hubbard and Pratt, 2002; Simourd and Andrews, 1994). To develop the risk scale, cross-tabulations between the risk factors and reincarceration for any reason were analyzed. The difference in the percentage reincarcerated served as the weight for each factor. These factors were added to create an overall risk score (see Table 1 for factors and weights). Although this method of risk assessment instrument construction has not been used in the past, this was not our goal. The risk measure was simply additive and accounted for the contribution of each variable in explaining reincarceration. Previous research on the methods of risk instrument construction indicate that no particular method outperforms any other. Even though the simple counting scheme used here and in Burgess (1928) is outdated (Jones, 1996) and "intolerably crude and inadequate" (Wilkins and MacNaughton-Smith, 1964:18), there is no indication that more sophisticated techniques outperform this method (Gottfredson and Gottfredson, 1979; Tarling and Perry, 1985; for a complete discussion, see Jones, 1996). The measure contained in the current research was developed to control for differences in risk. Hence, we do not suggest this configuration of variables and weights be applied to other populations for the purpose of predicting risk. The instrument has face validity and is related to the studies outcome—therefore, the measure serves the intended purpose for the study. The risk score demonstrated fair predictive validity with a correlation of 0.25 between the aggregate risk score and reincarceration, which is similar in value to those found in other studies of other risk prediction instruments (Gendreau et al., 1996; see also Gendreau et al., 2003; Hemphill and Hare, 2004; Kroner and Mills, 2001).

After the risk score was calculated, appropriate cutoff scores for risk

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TABLE 1. RISK ASSESSMENT FACTORS AND WEIGHTS

Factor	Weight	Factor	Weight
Age		Prior Arrests	
17–22	16.9	2+	12.3
23–36	7.2	1	2.9
37+	0	0	0
Less than High School Graduate		Prior Incarcerations	
Yes	7.6	2+	22.8
No	0	1	6.6
		0	0
Marital Status			
Single	7.5	Prior Conviction for Violent Offense	
Married	0	Yes	3.5
		No	0
Psychological Problem Indicated			
Yes	1.90	Prior Conviction for Sex Offense	
No	0	Yes	5.8
		No	0
Alcohol Problem Ever			
Yes	4.7	Previous Community Control Violation	
No	0	Yes	6.9
		No	0
Drug Problem Ever			
Yes	9.0	Current Felony Degree	
No	0	3rd, 4th, 5th	15.6
		2nd	6.7
Unemployed At Arrest		1st	0
Yes	6.5		
No	0	Current Offense Type	
		Drug, Property, Sex	5
		Person or Other	0

levels were developed, which resulted in four groups: low, low/moderate, moderate, and high. Table 2 displays the distribution of risk categories for the three groups of offenders (successful, unsuccessful terminations, and the comparison group). The distributions of risk categories among the three offender groups differed significantly; however, each category of risk is represented in each of the three groups of offenders. Table 2 also presents the recidivism rates for each category of risk for the entire sample of offenders. As indicated, the recidivism rates increase substantially with each category of risk.

Finally, data were collected on several outcome measures, including any new arrest, incarceration for a new criminal offense, and incarceration for a technical violation. The follow-up period for all offenders was two years after program termination date or two years after release from prison (comparison group). Researchers have argued that arrest data are the best measure of recidivism (Maltz, 1984; see also Blumstein and Cohen,

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TABLE 2. CUTOFF SCORES AND ASSOCIATED RECIDIVISM RATES

Risk Category (Score)	Successful	Unsuccessful	Comparison	Recidivism Rate Overall
Low (0–37)	298 (5.7%)	72 (3.4%)	361 (6.2%)	18%
Low/Moderate (38–54)	1223 (23.2%)	402 (19.2%)	1161 (19.8%)	30%
Moderate (55–75)	2651 (50.3%)	999 (47.6%)	2589 (44.2%)	43%
High (76–115)	1096 (20.8%)	625 (29.8%)	1744 (29.8%)	58%

χ^2 for risk category by group membership = 160.124; df = 6; p = 0.000.

1979) as this measure is most likely to capture illegal activities because only one level of discretion (police officer) is involved at the arrest stage. However, arrest data can be incomplete (Langan and Levin, 2002). Each outcome measure has its strengths and weaknesses. Therefore, we estimated models that predict the likelihood of new arrest, incarceration for a criminal offense, incarceration for a technical violation, and incarceration for any reason. The main analyses reported in the current research are based on the results of the model predicting incarceration for any reason. Although this is a conservative measure of criminal behavior, prison intake records are fairly complete and accurate when compared with other outcome measures.[4]

DESIGN AND ANALYSIS

Multivariate logistic regression models were calculated for the overall group and each CBCF and HWH program site where the number of terminations from the program during FY99 was greater than or equal to 50 cases.[5] The multivariate logistic regression models controlled for race, gender, group membership, risk level, and one interaction term between group membership and risk level. This model examined the effects of treatment, holding all other factors constant, and it provided information on the effects of treatment among levels of risk. This model determined whether treatment was more or less effective with different offenders based on risk. Results from the multivariate logistic regression models calculated adjusted predicted probabilities of recidivism. These probabilities then ascertained the effectiveness (or lack thereof) of the HWH and

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4. Additional models using arrest, return to prison for a technical violation, and return to prison for a new criminal offense were also estimated. The results of these analyses revealed similar trends to the results reported.

5. Sites where the number of successful terminations was less than 50 were combined, for the purposes of analyses, into a "small programs" group. As a result the number of programs for individual analyses was reduced to 38.

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CBCF in reducing recidivism. Separate probabilities were also calculated for each risk level and program.

RESULTS

Table 3 reports the demographic characteristics, criminal history, and offense characteristics of the study samples and were calculated for successful terminations (ST), unsuccessful terminations (UST), and the comparison group (CG). The average age of offenders in the ST, UST, and CG groups were 32, 31, and 35, respectively. Half of the offenders in the ST group were white and 86% were male. The overwhelming majority (90%) had at least one previous arrest, and 33% had at least one previous incarceration in a state or federal prison. A slightly smaller percentage of offenders in the UST and CG groups were white (43% and 46%). An equal percentage of the UST group had at least one previous arrest (90%), whereas a slightly lower percentage of the CG group had at least one previous arrest (86%). However, a greater percentage of offenders in the UST and CG groups were male (91% and 92%) and had at least one previous incarceration in a state or federal prison (41% and 40%). The comparison group had greater percentages of first- and second-degree felony offenders, whereas the experimental group had greater percentages of fourth- and fifth-degree felony offenders. The UST and ST groups did not differ significantly on felony degree. A greater percentage of offenders in the ST group had property and other offenses, and smaller percentages had violent, sex, and drug offenses. The percentages of offenders convicted of a crime against a person and property offenses was lower in the ST group, compared with the UST group. The percentage of offenders convicted of a drug offense was higher in the ST group than in the UST group. A greater percentage of offenders in the ST group, compared with the CG, had property and other offenses, and smaller percentages had violent, sex, and drug offenses. Most factors (with the exception of race and gender) were included in the risk measure.

Statistics on two national samples of offenders are also included in Table 3. These data indicate that the sample in the current study is fairly similar to probationers and offenders released from prison around the country. Very similar percentages on gender, race, previous arrests and incarcerations, and offense type were found in a national sample of prisoner releases in 1994. The data on the national sample of probationers indicated that a similar percentage was white, whereas the percentage of men was slightly lower than that in the current sample. This information is important as it demonstrates that the sample used in the current study, in many regards, is fairly similar to the correctional population in the United States.

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TABLE 3. DEMOGRAPHICS, CRIMINAL HISTORY, AND OFFENSE CHARACTERISTICS

Measure	Experimental Successful Terminations	Experimental Unsuccessful Terminations	Comparison Group	National Sample of Prisoners[c]	National Sample of Probationers[d]
Average Age[b]	32	31	35	—	—
Percent White[ab]	51%	43%	46%	51%	55%
Percent Male[ab]	86%	91%	92%	92%	78%
Percent with at least one prior arrest[b]	90%	90%	84%	93%	—
Percent with at least one prior incarceration[ab]	33%	41%	40%	44%	—
Offense Level[b]					
1st degree felony	7%	7%	9%		—
2nd degree felony	15%	18%	29%		—
3rd degree felony	18%	19%	18%		—
4th degree felony	31%	29%	23%		—
5th degree felony	28%	28%	22%		—
Offense Type[ab]					
Person	19%	24%	26%	23%	—
Sex	2%	1%	4%	—	—
Drug	33%	26%	36%	33%	—
Property	35%	40%	29%	34%	—
Other	11%	9%	7%	2%	—

[a] Significant difference ($p < 0.05$) between successful terminations and comparison group.
[b] Significant difference ($p < 0.05$) between successful terminations and unsuccessful terminations.
[c] Data came from Recidivism of prisoners released in 1994.
[d] Data came from Probation and parole in the United States, 2001.

In our analyses, we estimated a logistic regression model for the entire sample and then for each of the 38 programs. Table 4 shows the parameter estimates from the logistic regression model for the entire sample. Two models are presented in Table 4. The first model controls for race, gender, risk, and group membership. This model indicates that males are significantly more likely than females to be reincarcerated; white offenders are less likely to be reincarcerated than African-American offenders; and higher risk offenders are more likely than are lower risk offenders to be reincarcerated. Finally, the parameter estimate for group membership indicated that the comparison group is slightly more likely to be incarcerated. Converting the difference in reincarceration rates based on the parameter estimate for group membership shows an overall difference of five percentage points in the likelihood of reincarceration.

Figure 1 displays the changes in the probability of reincarceration for the entire sample and for each program based on the logistic regression model presented in Table 4. The white bars and negative numbers are associated with increases in the likelihood of recidivism for the experimental group; that is, the white bars and negative numbers are associated with instances in which the comparison group recidivated at a lower rate than

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the experimental group that was placed in a residential facility. The gray bars and positive numbers represent decreases in the probability of recidivism, that is, instances in which the experimental group recidivated at a lower rate than the comparison group. The black bar in each graph represents the expected average reduction or increase in recidivism for all programs. As shown in Figure 1, most programs demonstrated an expected reduction in recidivism, ranging from 2% to 25%, with an overall reduction of 5%. Approximately one third (n = 12) of the programs were associated with increases in the expected recidivism rate of the program participants compared with the comparison group. These increases ranged from 1% to 29%, with one program having no effect. As noted earlier, we were interested in how the effects of treatment varied among the different levels of risk. We therefore estimated a model that included a group by risk interaction term. The results of this model are also presented in Table 4.

TABLE 4. LOGISTIC REGRESSION MODEL PREDICTING REINCARCERATION

Measure	Parameter Estimate[a]	Exp(b)	Parameter Estimate[b]	Exp(b)
Sex	−0.7280**	0.4829	−0.7252**	0.4842
Race	−0.1172**	0.8894	−0.1162**	0.8903
Group	0.0912*	1.0955	−0.4785**	0.6197
Risk	0.6313**	1.8801	0.5273**	1.6944
Risk*Group Interaction	—	—	0.1877**	1.2065
Constant	−2.3435**	—	−2.0343**	—

* Significant at 0.05
** Significant at 0.01
[a] Model chi-square = 784.414; df = 4; $p < 0.0000$; Nagelkerke R^2 = 0.09.
[b] Model chi-square = 796.756; df = 5; $p < 0.0000$; Nagelkerke R^2 = 0.10.

The data displayed in second column of Table 4 show that male and African-American offenders were more likely to be reincarcerated than were female and non-African-American offenders. In the second model, risk was positively and significantly related to reincarceration; however, the parameter estimate for group membership indicated that the comparison group was less likely to be incarcerated. Of greater importance is the interaction term, which indicates that as risk increases the iatrogenic effects of placement in a residential facility dissipate and become treatment effects. Hence, a model with the interaction term was estimated for each program. The results of these analyses are displayed in Figures 2 through 5.

Figure 2 displays the changes in the expected probability of recidivism

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FIGURE 1. TREATMENT EFFECTS BY PROGRAM
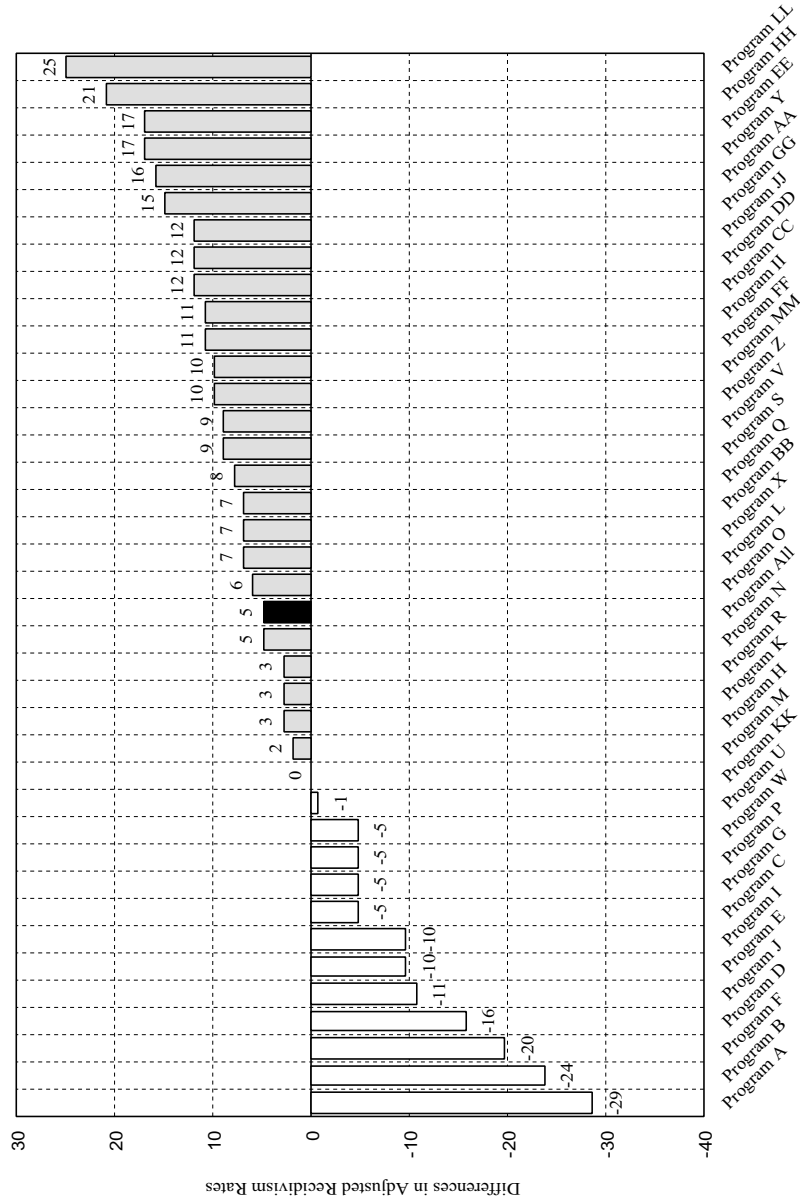
for low-risk offenders. In 24 of the 36 programs,[6] treatment had no effect
or was associated with an increase in the probability of recidivism for low-
risk offenders. Only 12 programs were associated with reductions in the
probability of recidivism for low-risk offenders. The largest reduction was
nine-percentage points. A four-percentage point increase in the
probability of recidivism was found for the entire sample.

Changes in the expected probabilities for low/moderate-risk offenders
are shown in Figure 3. Overall, a one-percentage point increase in the
probability of recidivism was estimated for the low/moderate-risk
offender. A total of 19 of the 38 programs failed to have any effects on
recidivism or were associated with increases in the likelihood of recidivism
for program offenders. Conversely, 19 programs were associated with a
reduction in the expected probabilities of recidivism. However, only 5
programs had expected reductions of more than ten percentage points.

The value of the residential programs becomes apparent in Figure 4,
which displays the expected changes in the probability of recidivism for
moderate-risk offenders. Nearly 70% of the programs showed a reduction
in the probability of recidivism for this group of offenders. The largest
reduction was 26 percentage points. The average expected reduction in
the likelihood of recidivism for moderate-risk offenders was three percent-
age points. Nonetheless, 13 programs had no impact on recidivism or were
associated with increases in recidivism rates among moderate-risk
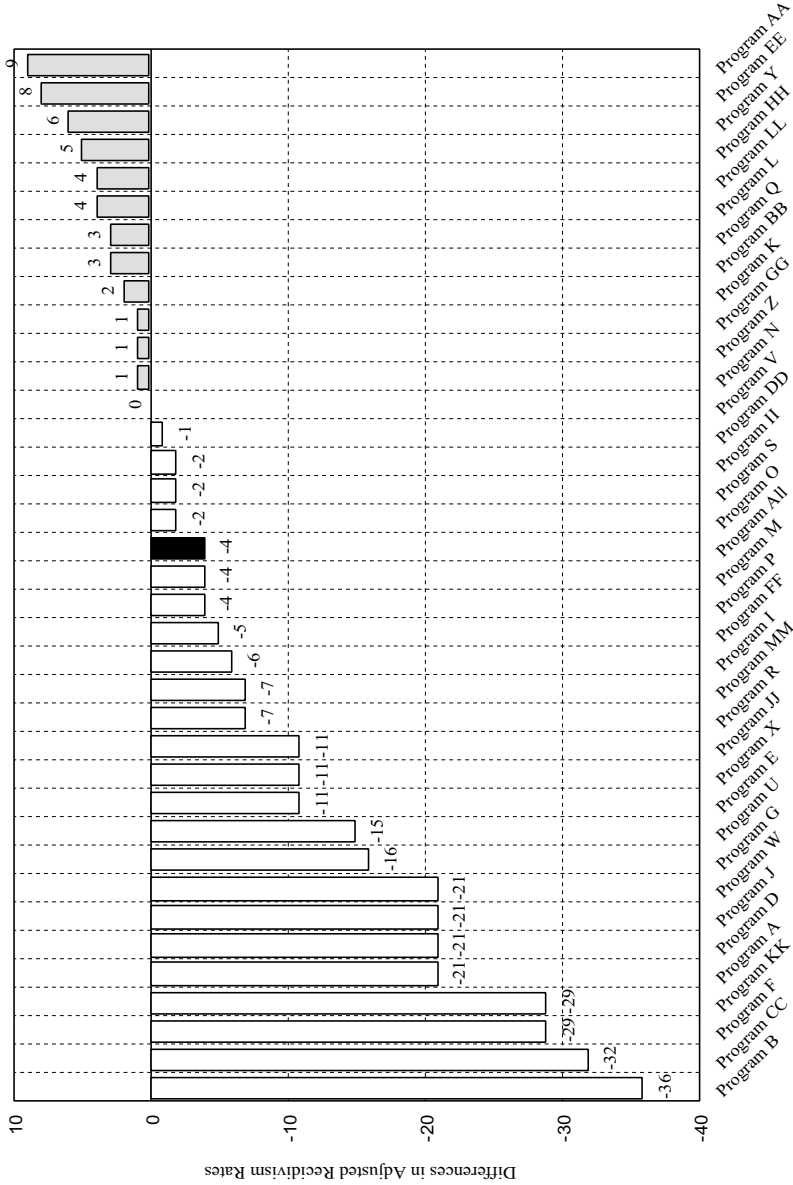offenders.

Finally, Figure 5 shows the reductions in recidivism rates for high-risk
offenders. A total of 27 of the programs were associated with reductions
in recidivism with an averge reduction of eight percentage points for this
group of offenders. The reductions in recidivism ranged from 2 to 34 per-
centage points. Only 11 programs were associated with increases in the
expected recidivism rates for this group.

Perhaps the risk principle can best be seen by examining the treatment
effects for low- and high-risk offenders in programs MM, KK, and JJ. Fig-
ure 5 illustrates that each of these programs produced a significant effect
size for high-risk offenders, reducing recidivism 34%, 32%, and 30%,
respectively. However, Figure 2 shows that these three programs
increased recidivism for low-risk offenders (7%, 11%, and 29%, respec-
tively). As each program offered similar services and interventions for all
offenders, these differences can best be explained by risk, rather than by
programmatic, factors.

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6. Two programs had no low-risk offenders; therefore, expected changes in
probabilities were not calculated for these programs which reduced the total number of
programs with low-risk offenders to 36.

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FIGURE 2. TREATMENT EFFECTS BY PROGRAM FOR LOW-RISK OFFENDERS

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FIGURE 3. TREATMENT EFFECTS BY PROGRAM FOR LOW/MODERATE-RISK OFFENDERS
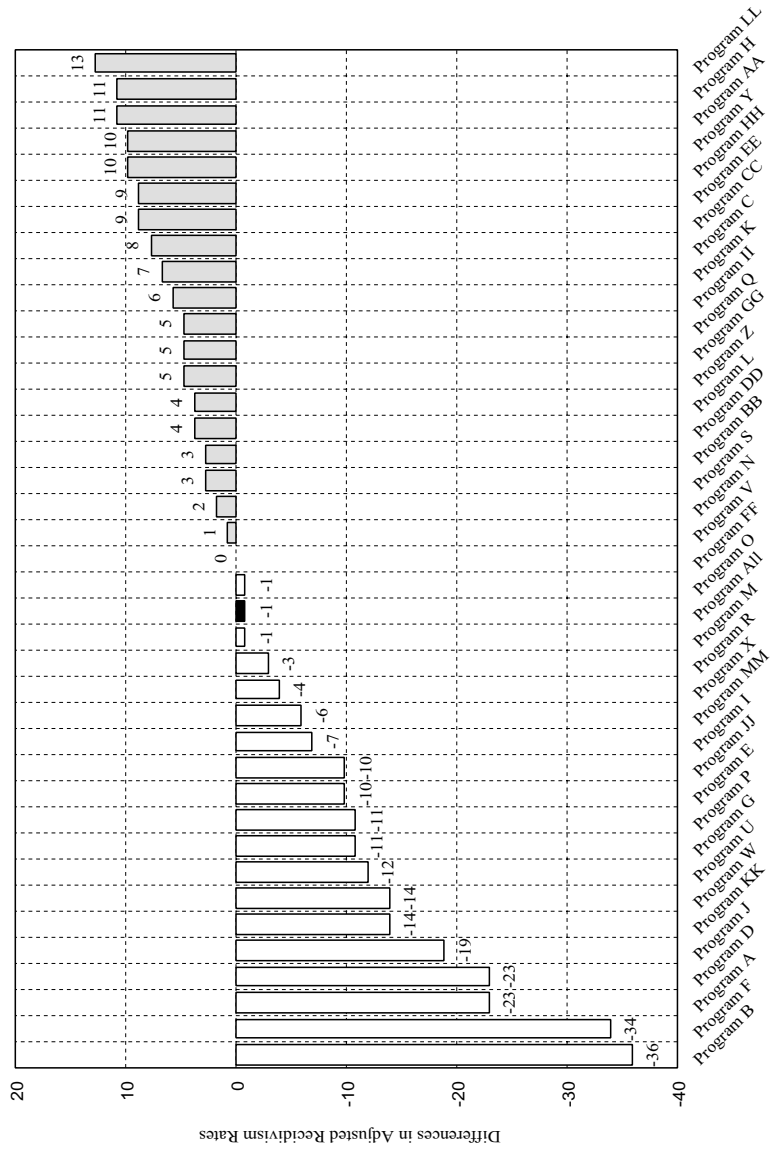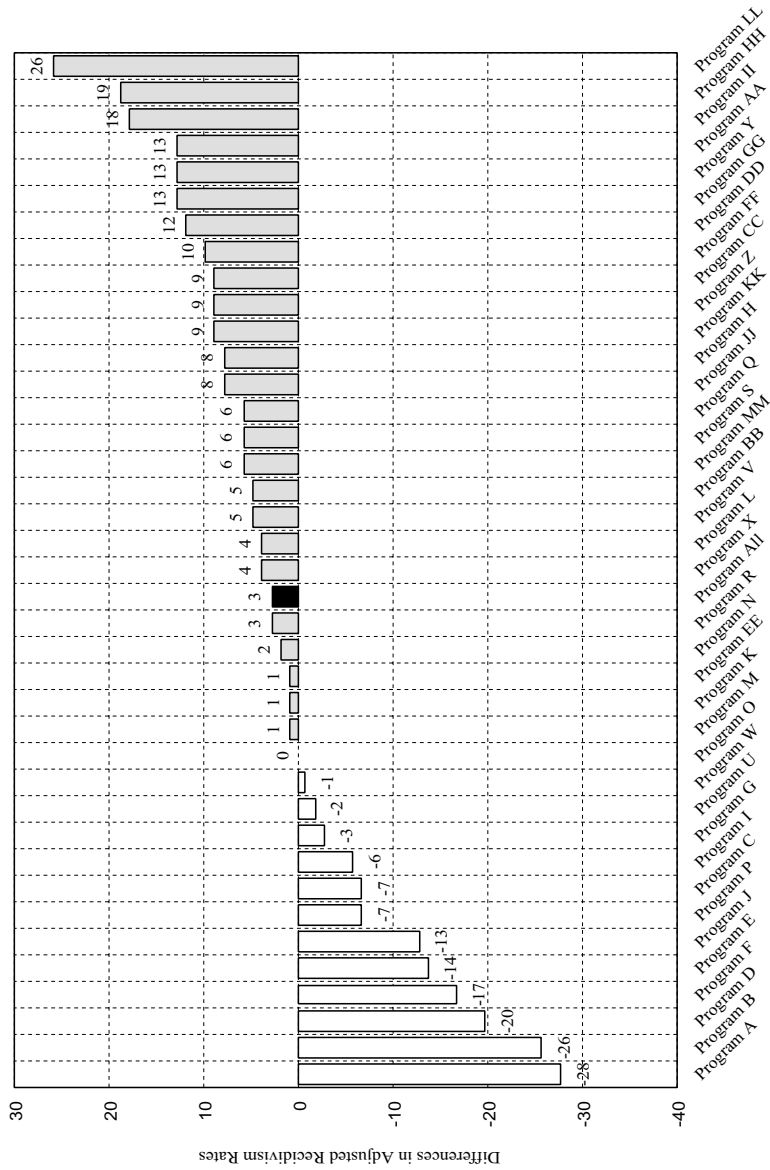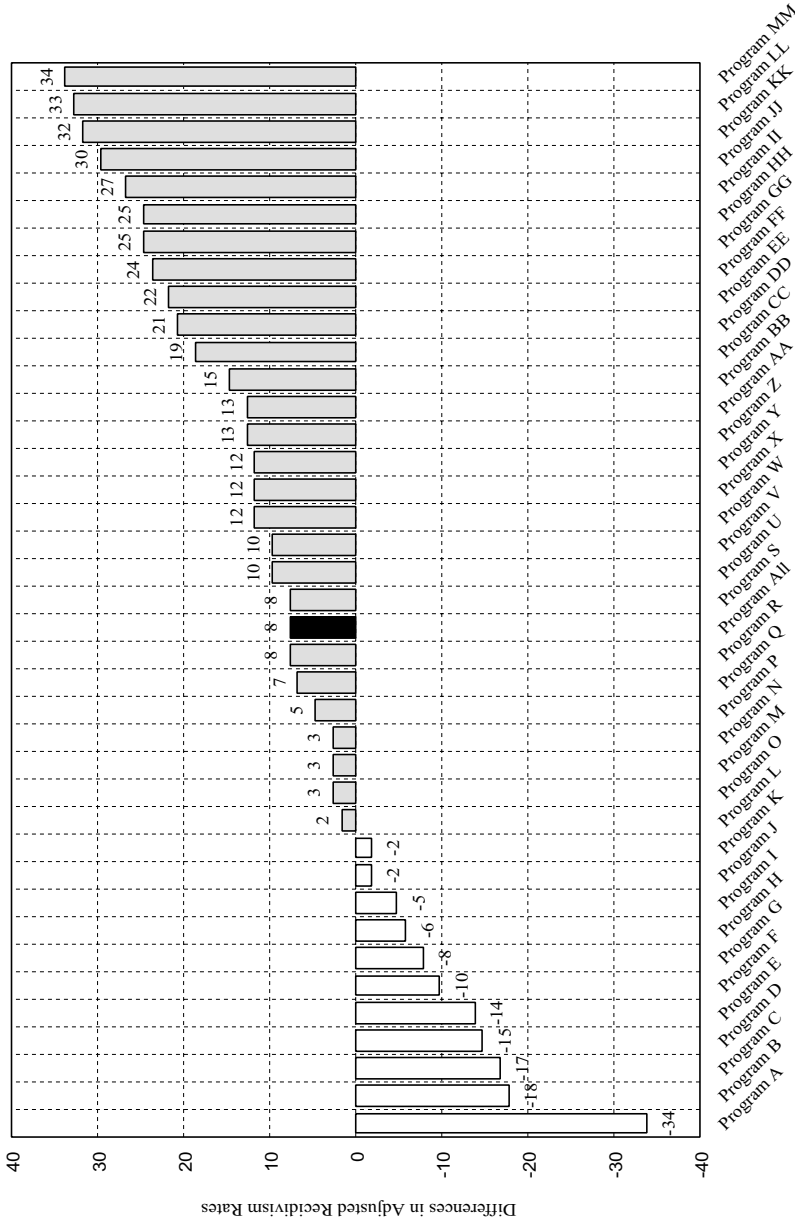
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FIGURE 4. TREATMENT EFFECTS BY PROGRAM FOR MODERATE-RISK OFFENDERS

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FIGURE 5.   TREATMENT EFFECTS BY PROGRAM FOR HIGH-RISK OFFENDERS

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ALTERNATIVE ANALYSES

As we stated earlier, we estimated models using ST and UST as the experimental group and alternative outcome measures were estimated. More specifically, we estimated models that predicted incarceration for any reason, incarceration for a new offense, incarceration for a technical violation, and any new arrest. We estimated models for each of these outcome measures using all program participants (both ST and UST combined) and then using only the ST group. The parameter estimates for these eight models are contained in Table 5.

TABLE 5. LOGISTIC REGRESSION MODEL PREDICTING ARREST, REINCARCERATION FOR A TECHNICAL VIOLATIN, REINCAARCERATION FOR A NEW CRIME, AND ANY RECINCARCERATION USING SUCCESSFUL TERMINATIONS AND ALL TERMINATIONS

Variables	Any Incarceration		Incareration for New Offense		Incarceration for TV		New Arrest	
	All	Successful	All	Successful	All	Successful	All	Successful
Sex	−0.73**	−0.73**	−0.33**	−0.42**	−0.83**	−0.77**	−0.52**	−0.57**
Race	−0.16**	−0.12**	−0.15**	−0.17**	−0.02	0.05	−0.34**	−0.33
Group	−0.93**	−0.48**	−1.02**	−0.77**	−0.86**	−0.28	−0.90**	−0.79
Risk Category	0.52**	0.53**	0.54**	0.57**	0.34**	0.40**	0.53**	0.51
Group*Risk Interaction	0.20**	0.19**	0.15**	0.13*	0.16**	0.11	0.16**	0.19**
Constant	−1.56**	−2.03**	−2.44**	−2.68**	−1.84**	−2.47**	−1.13**	−1.24**

* Significant at 0.05.
** Significant at 0.01.

The first panel of Table 5 shows the parameter estimates for the two models predicting incarceration for any reason. The first column displays the results using all program participants and the second displays the results using only STS, which were reported and discussed in Tables 3 and 4. The direction of the parameter estimates and the tests of significance are consistent in the two analyses. Although the parameter estimate for group membership was larger in the model using all program participants, the interaction term between group membership and risk was significant and positive, which indicates that the effects of treatment were more pronounced with the higher risk offenders than with the low-risk offenders even when including unsuccessful terminations.

The second panel of Table 5 displays the parameter estimates for the model predicting incarceration for a new offense. The direction and significance of the parameter estimates were again consistent across the two

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models. In addition, the parameter estimates for the interaction term were positive and significant in both models.

The third panel of Table 5 reports the parameter estimates for the model predicting incarceration for a technical violation. Consistent with other models, females were less likely to be incarceration for a technical violation and higher risk offenders were more likely to be incarcerated for a technical violation. However, only in the model using the ST and UST groups combined did the parameter estimates for group membership and the interaction term attain significance. Of interest, the parameter estimate for race was not significant in either model predicting incarceration for a technical violation.

Finally, the last panel of Table 5 reports the parameter estimates for the model predicting new arrest. The parameter estimates were again consistent across the two models in terms of direction and significance. The parameter estimate for group membership indicated a direct effect favoring the comparison group, but the interaction term indicated that the effects of treatment increased to favor the treatment groups as the risk level increased.

In all eight models, females were less likely to be incarcerated or arrested and higher risk offenders were more likely to be incarcerated or arrested. In six of the eight models, white offenders were less likely to be arrested or incarcerated; however, race had no impact on the likelihood of reincarceration because of a new technical violation. In seven of the eight models, the parameter estimates for group membership and the interaction term were significant, the one exception involved the model that predicted incarceration for a technical violation in the ST group only. The combination of the negative parameter estimate for group membership and the positive parameter estimate for the interaction term indicated that the comparison group, in general, was less likely to experience a negative outcome. However, as risk increased, they were increasingly more likely to experience a negative outcome. This increased likelihood to offend often exceeded those found in the higher risk experimental groups. These trends persisted despite the use of four different outcome measures and the use of two groups of experimental cases. In light of the above findings, we conclude that the effects reported in the main analyses provide strong support for the risk principle rather than simply being an artifact of using incarceration for any reason as the outcome measure or focusing our analyses on successful terminations.

DISCUSSION

The results of this study demonstrate that the effectiveness of residential treatment programs in Ohio differed as a function of offender risk levels.

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Residential programs were associated with an increase in the recidivism rates of low- and low/moderate-risk offenders relative to the recidivism rates of the comparison group. These increases in recidivism rates were substantial and seriously question the policy of admitting low-risk offenders into residential programs—not just in Ohio but across the country, at every jurisdictional level. The exact opposite of the desired results were obtained with the low- and low/moderate-risk groups of offenders: The comparison group outperformed the experimental group at lower levels of risk whereas the experimental group outperformed the comparison group at higher levels of risk. This relationship is consistent with other studies that have investigated the effect of treatment at different levels of risk (Andrews et al., 1990b; Andrews and Dowden, 1999; Dowden and Andrews, 1999a, 1999b, 2000; and Lipsey and Wilson, 1998).

The current research showed that residential programs are effective with higher risk offenders. Almost 70% of the programs demonstrated effectiveness with moderate- and high-risk offenders. Reductions in recidivism increased in magnitude and frequency with these two groups of offenders compared with the lower risk offenders. For the entire sample of moderate-risk offenders, a three-percentage point reduction was found, whereas an eight-percentage point reduction was found for high-risk offenders. These reductions in recidivism rates are partially masked by the four- and one-percentage point increases found among low- and low/moderate-risk offenders.

The results of this research are critical for formulating policies and for developing methodologies to investigate the impacts of correctional programs on criminal behavior. First, low-risk offenders should be excluded, as a general rule, from residential programs. We realize that there will always be exceptions to every rule for a variety of reasons. Nonetheless, corrections agencies should target mostly high-risk offenders for placement in residential programs.[7] If a program finds that it is receiving low-risk placements, the program should divert such offenders to interventions that are more accommodating and sensitive to the disruption in prosocial contacts that such programs might cause (e.g., getting low-risk offenders on work release immediately rather than making them wait for several weeks to return to the work force; maintaining prosocial family and friendship contacts while in residential programs; and shortening the duration of in residential program stay).

In terms of methodology, this study underscores the importance of studying the different effects of programs among distinct groups of offenders

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7. One exception might be parole violators. In additional research reported elsewhere, Lowenkamp and Latessa (2002) found residential programming to be effective for parole violators regardless of risk level.

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(Palmer, 1994). We discourage post hoc investigations that search for treatment effects. However, a considerable body of evidence supports an investigation of effects among risk levels. Unfortunately, such approaches are rare, as few studies have determined whether program effects differ among risk levels.

In conclusion, our study showed that program effects not only vary by risk but also vary within risk categories. Heterogeneity in the changes in the probability of recidivism within each category of risk leads us to believe that other factors, aside from risk level, are related to program effectiveness. Several programs demonstrated no reductions in recidivism regardless of the risk level of offenders. It is likely that program characteristics such as treatment modality, implementation, staff characteristics, and assessment practices have strong effects on program outcomes. An investigation of these relationships was, however, outside the scope of this research. Investigating the nature of the relationships between program characteristics, such as assessment and intervention strategies, and program effectiveness can help practitioners develop more effective correctional programs that will lead to enhanced public safety. Therefore, future research should not only seek to replicate our findings but should also investigate the relationship between other program characteristics and effectiveness (Andrews and Dowden, 1999; Gendreau and Goggin, 2000; Gendreau et al., 2002; Lipsey 1999a, 1999b), as understanding why some programs were effective with high-risk offenders while some were not is crucial to the development of effective treatment programs.

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Christopher T. Lowenkamp is an Assistant Director of The Corrections Institute and
The Center for Criminal Justice Research at the University of Cincinnati, Division of
Criminal Justice. His research interests include the evaluation of correctional program-
ming and macrolevel criminological theory. Recent publications have appeared in *The
Journal of Criminal Justice*, *Criminal Justice and Behavior*, *Federal Probation*, and *The
Journal of Research in Crime and Delinquency*. Contact: Christopher T. Lowenkamp,
Division of Criminal Justice,University of Cincinnati, PO Box 210389, Cincinnati, OH
45221-0389, E-mail: christopher.lowenkamp@uc.edu.

Edward J. Latessa is a Professor and Head of the Division of Criminal Justice at the
University of Cincinnati. Professor Latessa has published over 75 works in the area of
criminal justice, corrections, and juvenile justice. He is co-author of seven books,
including the tenth edition of *Corrections in America* and *Corrections in the Commu-
nity,* which is now in its third edition. Dr. Latessa served as President of the Academy of
Criminal Justice Sciences (1989–1990). He has also received several awards, including
the Simon Dinitz Criminal Justice Research Award from the Ohio Department of
Rehabilitation and Correction (2002), the Margaret Mead Award for dedicated service
to the causes of social justice and humanitarian advancement by the International Com-
munity Corrections Association (2001), and the Peter P. Lejins Award for Research
from the American Correctional Association (1999). Contact: Edward J. Latessa, Ph.D.,
Division of Criminal Justice, University of Cincinnati, PO Box 210389, Cincinnati, OH
45221-0389, E-mail: edward.latessa@uc.edu.

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