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UTILIZING BEHAVIORAL INTERVENTIONS TO IMPROVE SUPERVISION OUTCOMES IN COMMUNITY-BASED CORRECTIONS

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The number of offenders supervised in the community has grown significantly over the past few decades, whereas successful completions of probation and parole terms have been declining during the same time period. The current study examines the impact of rewards and sanctions on offenders in an Intensive Supervision Program (ISP). Data were collected on a random sample of 283 offenders who participated in an ISP between 2000 and 2003. Agency records, including supervision notes, violation reports, and other offender-related correspondence, were used to track offenders' sanction and reward histories during their participation in the program. Controlling for a number of variables, the study found that the use of both sanctions and rewards led to higher success rates. Administering rewards in proportionally higher numbers than sanctions produced the best results, especially when a ratio of four or more rewards for every sanction was achieved. Correctional administrators are encouraged to identify ideological obstacles that may impede the application of behavioral techniques and to carefully train and guide line staff in the use of sanctions and rewards.

Keywords: community corrections; revocations; behavioral interventions; operant learning

Increasing offender compliance with release conditions has emerged as one the most pressing issues facing the American correctional system. During the past three decades, the reliance on the institutions of probation and parole for managing our relentlessly burgeoning correctional population has grown substantially. In 1980, there were approximately 1.3 million offenders under community supervision in the United States (Sourcebook of Criminal Justice Statistics, 2010). Today, that number stands at an estimated 5.1 million, which accounts for nearly 70% of the total correctional population (Glaze & Bonczar, 2009).

Although the growth of community-based corrections has been remarkable, perhaps even more striking has been the decline in success rates for offenders placed on community supervision. Since the 1980s, the proportion of offenders who successfully complete their term of supervision has declined substantially. In 1985, approximately 80% of probationers successfully completed their supervision (Bureau of Justice Statistics [BJS], 1990); by 2005, however, this number declined to an estimated 59% (Glaze & Bonczar, 2006). Similar trends have been observed in the parole population (BJS, 1990; Glaze & Bonczar, 2009). Together, these statistics reveal that during a period of time in which community-based

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corrections experienced unprecedented growth, it also incurred considerable declines in completion rates, resulting in a dramatic rise in offenders revoked from community supervision.

The impact of community corrections failures has been substantial and far-reaching. There is strong reason to conclude that revoked offenders have contributed to prison growth and crowding. Travis and Lawrence (2002) report that parole violators accounted for roughly 17% of all new prison admissions in 1980; by 1999, that rate more than doubled, with an estimated 35% of all new admissions consisting of parole violators. Not surprisingly, the economic effects of declining success rates have been considerable. For example, the Criminal Justice Policy Council (2002) reported that revoked felony probationers cost taxpayers in Texas more than $550 million in 2001. Similarly, the Little Hoover Commission (2003) estimates that the state of California spends $900 million annually to house parole violators.

Probably more important than the institutional and economic consequences of the mass incarceration of community corrections failures is the impact these trends have on the offenders, their families, and the communities in which they reside. In addition to forfeiting their liberty, revoked offenders endure a variety of collateral consequences that follow them after their release, such as decreased employment opportunities, weakened family ties, and social exclusion (Petersilia, 2003; Rollo, 1988; Sabol & Lynch, 2003; Travis, Solomon, & Waul, 2001). Families are often left to cope, both emotionally and financially, with the removal of the offender from the family unit (Travis, 2005). Furthermore, high revocation rates contribute to the problems many disadvantaged communities face related to the large-scale removal of residents to correctional facilities (Clear & Rose, 2003). As articulated by Clear and Rose (2003), overreliance on incarceration results in "a reduction in human and social capital and an increase in social isolation," which "has led to the proliferation of communities without the tools necessary for adequate informal social control" (p. 29).

The destructive effects of rising revocation rates are clear, and the need to take steps to mitigate these effects is paramount. Many jurisdictions have responded by focusing on increasing offender compliance with the conditions of their community supervision. It is evident that a large proportion of offenders under community supervision do not comply with all conditions of their supervision at all times (Clear, Harris, & Baird, 1992; Langan & Cuniff, 1992; Taxman, 1995). One study completed by Gray, Fields, and Maxwell (2001) revealed that approximately 76% of probationers in Michigan committed at least one violation during the course of their supervision. Given that noncompliance is a necessary precursor to revocation, it stands to reason that increasing offender compliance with release conditions has the potential to improve supervision outcomes.

INCREASING OFFENDER COMPLIANCE WITH RELEASE CONDITIONS

Two types of strategies have emerged for increasing offender compliance with supervision conditions. The first, and most commonly used, type is *deterrent-based strategies.* Deterrent-based strategies can be considered one-dimensional in that they focus exclusively on the use of punishment or threat of punishment to increase compliance. More specifically, they seek to reduce offender misconduct by increasing the certainty and severity of punishment for recalcitrant behavior. The proliferation of new programs and technologies in the supervision of offenders, such as intensive supervision, electronic monitoring, and probation–police partnerships, can be attributed, in part, to the belief that these tools of supervision

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have the potential to enhance conformity by increasing the likelihood of detection (Gendreau, Cullen, & Bonta, 1994). Other jurisdictions have focused on increasing the consequences of noncompliance. For example, a policy adopted in California in the mid-1990s dictated that all violations for certain high-risk offenders be referred to the Board of Parole Hearings for disposition and possible recommitment, thereby severely limiting the broad discretion parole officers and supervisors once wielded when responding to acts of noncompliance (Grattet, Petersilia, & Lin, 2008).

There is little evidence to suggest that deterrent-based strategies have been successful in increasing offender compliance with release conditions. In many instances, these strategies have contributed to growing revocation rates. Research has consistently revealed a positive relationship between supervision intensity and the detection of technical violations, which has resulted in an increase in offenders being returned to incarceration for violating the terms of their supervision (Petersilia, 1998; Petersilia & Turner, 1993; Tonry & Lynch, 1996). Similarly, policies designed to enhance penalties for disobedient behavior have contributed to the mass incarceration of community corrections failures (Grattet et al., 2008). In light of these findings, correctional agencies have been criticized for their overreliance on deterrent-based strategies to manage offender behavior (Andrews & Bonta, 1998; Gendreau et al., 1994; Petersilia, 2007).

BEHAVIORAL STRATEGIES

Behavioral strategies represent a second approach for increasing offender compliance with community supervision conditions. Behavioral strategies, unlike deterrent strategies, use a more comprehensive approach to induce offender compliance based on the principles of operant learning theory. Rather than focusing strictly on punishing nonconforming acts, behavioral strategies seek to both sanction violation behavior and reinforce compliant or desired behavior (Andrews & Bonta, 1998).

Operant learning theory represents a psychological approach to human behavior and is most closely associated with the work of behavioral psychologists such as Thorndike and Skinner (Lester, Braswell, & Van Voorhis, 2004). This theory is based on the axiom that behavior is learned. More specifically, it is learned through the consequences that result from one's actions (Skinner, 1966). Behavior produces changes, both intended and unintended, in one's environment. Operant learning theory posits that behaviors that result in positive or pleasurable changes will be continued, whereas those that produce negative or unpleasant changes will be discontinued (Jeffrey, 1965).

The conceptualization of behavior as the by-product of a learning process implies that behavior is not beyond external control. Operant learning theory asserts that behavior can be modified or conditioned through manipulation of the environmental changes that follow the behavior (Jeffrey, 1965; Lester et al., 2004). Two types of environmental manipulation can be used to bring about the desired change, *reinforcements* and *punishments*. Reinforcements are meant to increase the likelihood or frequency of a desired behavior through the "judicious use of rewards" (Lester et al., 2004, p. 67). Reinforcements can be characterized as either positive or negative. Positive reinforcement refers to the application of a pleasurable stimulus (i.e., praise or a monetary reward), while negative reinforcement involves the removal of an aversive stimulus (i.e., removing a child from timeout) (Jeffrey, 1965; Lester et al., 2004). The second type of environmental manipulation involves the use of punishments.

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Punishments can be "defined as any consequence of a specific behavior that reduces the likelihood that the behavior will be repeated, or repeated at the same rate, in the future" (Marlowe & Kirby, 1999, p. 4). As with reinforcements, punishments can be both positive—the presentation of an undesirable stimulus (i.e. pain or verbal admonishment)—and negative—the elimination of a desirable stimulus (i.e. taking away a child's favorite toy) (Jeffrey, 1965; Swenson, 1980).

Applying operant learning theory to the management of offenders suggests that offender compliance can be enhanced by manipulating the environmental consequences of their behavior. This can be accomplished in two ways, as demonstrated through popular interventions such as drug courts and therapeutic communities (TC) (Burdon, Roll, Prendergast, & Rawson, 2001; National Institute on Drug Abuse, 2002; Marlowe, 2007; Welsh, 2007). First, reinforcements can be used to increase the likelihood that conforming behavior will be continued. In drug courts, for example, frequently used rewards include praise from the drug court team, promotion into a new program phase, and early release from drug court (Lindquist, Krebs, & Lattimore, 2006).

A second way of applying operant learning theory for offenders is by using punishments as a response to misconduct to lessen the probability of reoccurrence. Noncompliant offenders who receive sanctions for their transgressions will be less inclined to continue the behavior because of the unpleasant changes in their environment resulting from their actions. Examples of punishments used in drug courts and TC settings include jail terms, enhanced treatment requirements, and program dismissal (Graham & Wexler, 1997; Lindquist et al., 2006).

Behavioral research suggests that programs that are able to incorporate sanctions in concert with the use of rewards to reinforce conforming behavior will be more effective than those that rely on sanctions alone (Marlowe & Kirby, 1999). More specifically, Gendreau (1996) advises that effective behavioral intervention strategies with offenders require reinforcements to outnumber punishments by at least a 4:1 ratio. Drug courts (see Shaffer, 2006; Wilson, Mitchell, & MacKenzie, 2006) and TCs (e.g., Inciardi, Martin, & Butzin, 2004; Prendergast, Hall, Wexler, Melnick, & Cao, 2004; Welsh, 2007) as well as other community-based programs using operant conditioning concepts (see, e.g., Friedmann, Rhodes, & Taxman, 2009; Prendergast, 2009) have produced promising findings in both increasing abstinence and reducing recidivism. However, there have been few attempts to examine the specific influence of rewards and sanctions on program outcomes. In other words, it is unknown how much operant conditioning techniques are contributing to the success of drug courts and TCs. Two recent studies have actually reported that the use of voucher incentives as a reinforcement has little or no benefit for drug court participants (Marlowe, Festinger, Dugosh, Arabia, & Kirby, 2008; Prendergast, Hall, Roll, & Warda, 2008). Vouchers are only one of several possible motivators that can be applied, however. More research is needed to investigate how effectively rewards and sanctions are being used in criminal justice settings to generate prosocial outcomes.

THE CURRENT STUDY

The current study seeks to expand our knowledge in this field by examining one agency's attempt to incorporate behavioral strategies into the supervision of offenders in an Intensive Supervision Program (ISP) as a method to improve offender outcomes. ISP programs

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emerged onto the correctional landscape beginning in the early 1980s and quickly spread throughout the nation (Petersilia, 1998). Individuals under ISP supervision are subject to stringent conditions of release, which are strictly monitored through rigorous supervision practices. The ISP movement was fueled largely by prison and jail crowding, which reached epidemic proportions in many jurisdictions during the final decades of the 20th century (Petersilia, 1998). ISP was promoted as a means to reduce prison populations and burgeoning correctional costs by diverting prison-bound offenders into less expensive community-based programs.

Research on the efficacy of ISP has revealed that these programs have been largely ineffective at reducing correctional costs and prison crowding because of the high revocation rates often experienced by ISP participants (Petersilia, 1998; Tonry, 1996). ISP programs have traditionally relied exclusively on deterrent-based strategies to induce offender compliance with conditions of release. As noted by Lurigio and Petersilia (1992), "The increased monitoring and surveillance in [ISP] programs are designed to boost offenders' perceptions of the effectiveness of the system in detecting and punishing their criminal behavior" (p. 9). An unintended consequence of this rigorous surveillance, however, has been the increased detection of offender noncompliance, which has contributed to high revocation rates and mass imprisonment of ISP failures (Petersilia, 1998; Petersilia & Turner, 1993; Tonry & Lynch, 1996).

During the inception of the Wyoming Department of Corrections (WDOC) ISP, administrators recognized the potential for high failure rates because of the structure of the program. In response to these concerns, behavioral tools were incorporated into the design of the program. The goal of the current study is to gain a better understanding of the effects of sanctions and rewards as a tool to improve supervision outcomes. Three research questions guided this inquiry:

1. Does the application of punishments for offenders who violate the terms of their community supervision influence the likelihood of program completion?
2. Does the application of rewards for compliant behavior influence the likelihood of program completion?
3. Does the ratio of rewards to punishments influence the likelihood of program completion?

To address these questions, data were collected on offenders supervised under WDOC ISP. The WDOC ISP is an adult (older than 18 years of age) felony-level program providing high-intensity supervision to both probationers and parolees.[1] The program supervises both male and female offenders. The WDOC ISP is designed to last approximately 1 year, during which time offenders progress through a series of three levels varying in supervision intensity. Participants are expected to abide by a broad array of supervision conditions, including abstinence from drugs and alcohol, curfews, restrictions on visitors, and adherence to a weekly schedule. Enforcement of these conditions is monitored through a variety of supervision practices such as frequent home visits, random drug testing, and electronic monitoring.

As stated above, a unique feature of the WDOC ISP is the incorporation of behavioral interventions into the supervision of offenders. More specifically, the program allows supervision agents to impose sanctions as a punishment for recalcitrant behavior as well as rewards to encourage compliant behavior. A partial list of the available sanctions and rewards is provided in Table 1.

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TABLE 1: List of WDOC ISP Sanctions and Rewards

Sanctions	*Rewards*
Verbal reprimand	Verbal praise and reinforcement
Written assignment	Good time
Modify curfew hours	Remove from electronic monitoring
Community service hours	Level advancement
Restrict visitation	Increased personal maintenance time
Program extension or regression	Approve special activity
Electronic monitoring	ISP fees reduced
Inpatient or outpatient treatment	Approve or extend special visitation
County jail time	

Note. WDOC = Wyoming Department of Corrections; ISP = Intensive Supervision Program.

The application of the behavioral interventions is determined by both departmental policy and officer or district supervisor discretion. Departmental policy, for example, requires agents to fully investigate and impose sanctions on all transgressions. However, the type and intensity of the sanction is left primarily to officer and district supervisor discretion. For instance, if an offender tests positive for marijuana or other illegal substance, department policy dictates that the offender must be sanctioned for the transgression, but the exact nature of the sanction (e.g., jail time, community service, or program regression) will be determined by the offender's supervising agent in consultation with the district supervisor.

The application of rewards is also dictated by a combination of department policy and officer discretion. Certain reinforcements are prescribed by program policy. For instance, it is required that offenders earn 10 days of good time for each violation-free month on the program. However, most applications of rewards remain at the supervising officer's discretion. The program structure allows agents broad freedom in the evaluation of "good behavior" that is deserving of recognition as well as the appropriate incentive to be awarded. For example, an agent may choose to verbally praise as often or infrequently as deemed appropriate given an offender's behavior under supervision.

METHOD

PARTICIPANTS

The study sample consisted of 283 offenders who were randomly selected from all offenders who participated in ISP between 2000 and 2003. These 283 offenders represent 20% of the 1,382 eligible cases.[2] Descriptive statistics on the study sample are provided in Table 2. This table reveals that the average age of offenders in the study sample is 31, with actual ages ranging from 18 to 78. Slightly more than 68% of offenders are male, and the vast majority are White (82.3%). More than 79% of offenders have obtained their high school diploma or GED. Of the study sample, 23% is married. Thus, the average offender in the study sample is a single, high school–educated, White male in his late 20s.

Focusing on criminal history and substance abuse characteristics reveals that only 36% of the sample had a prior felony conviction. Approximately half (49.1%) have been revoked from community supervision in the past. The most common offense type is property, making up more than 35.0% of the study sample, followed by drug (30.0%), violent (14.8%), sex

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TABLE 2: Description of Survey Sample

	n	%
Demographic characteristics		
Age		
M	31	
Mdn	28	
Range	18–78	
Gender		
Male	194	68.6
Female	89	31.4
Race/ethnicity		
White	233	82.3
Non-White	50	17.7
Marital status		
Married	64	22.6
Not married	219	77.4
Education		
Less than high school	59	20.8
More than high school or GED	224	79.2
Criminal history and substance abuse characteristics		
Prior felony conviction		
Yes	102	36.0
No	181	64.0
Prior revocation		
Yes	139	49.1
No	144	50.9
Current offense type		
Property	106	37.5
Drug	85	30.0
Violent	42	14.8
Sex	41	14.5
Other	9	3.2
Release type		
Probation	192	67.8
Parole	91	32.2
Drug problem		
Yes	203	71.7
No	80	28.3
WDOC ISP behavior characteristics		
ISP violation		
Yes	230	81.3
No	53	18.7
New crime		
Yes	46	16.3
No	237	83.7
Absconded supervision		
Yes	28	9.9
No	255	90.1
Type of discharge		
Successful	180	63.6
Failure	103	36.4
Total sample size	283	

Note. GED = general education development; WDOC = Wyoming Department of Corrections; ISP = Intensive Supervision Program. Values are n and percentage unless otherwise noted.

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(14.5%), and other (3.2%). The majority of offenders (68.0%) were under probation supervision, whereas the rest were under the jurisdiction of the parole board. A large proportion (71.7%) of the sample was considered to be drug-involved offenders, which agency policy defines as having used drugs within 5 years of intake.

Although under WDOC ISP supervision, more than 80.0% of offenders experienced at least one violation. However, only a small proportion (16.3%) was involved in the commission of a new offense. Further information not reported in Table 2 reveals that the vast majority (83.0%) of those who committed a new crime while under supervision were involved with relatively minor misdemeanor or traffic-related offenses. Approximately 10.0% of the offenders absconded supervision, and more than 63.0% of the sample successfully completed the WDOC ISP.

MATERIALS AND PROCEDURES

This research used a retrospective research design. More specifically, data were collected on a random sample of offenders who participated in the WDOC ISP between 2000 and 2003. Agency records—including supervision notes, violation reports, and other offender-related correspondence—were used to track offenders' sanction and reward histories during their participation in the program. In addition, a variety of background information (i.e., demographic, criminal history, and substance abuse history) was collected on study participants from their supervision files. These data sources enabled the calculation of the total number of sanctions and rewards and the ratio of rewards to sanctions per offender as well as whether the ISP program was completed, all of which were necessary to answer the three main research questions driving the study. Access to the data was granted by the WDOC on approval of the institutional review board from the primary investigator's academic institution. As the data for the study were compiled from existing WDOC data files and case records, no informed consent was required. To help protect the privacy of the research participants, no identifying information was retained.

DEPENDENT VARIABLE

The purpose of this research is to explore the influence of sanctions and rewards on ISP completion. Thus, the dependent variable is a dichotomous measure of program completion. Program completers were defined as individuals who satisfied the requirements of the WDOC ISP (*completers* = 1), whereas failures were defined as offenders who either absconded supervision or who had their probation or parole revoked (*failures* = 0).

CONTROL VARIABLES

To address the research questions listed above, a series of logistic regression models were used. In each of these models, three categories (demographic, criminal history or substance abuse history, and violation history) of control variables were included to more accurately isolate the effects of sanctions and rewards on ISP completion.

Demographic variables. Prior research on the predictors of success under community supervision has revealed a correlation between success under probation or parole supervision and certain demographic characteristics (Benedict & Huff-Corzine, 1997; Gray et al.,

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2001; Jones, 1995; Morgan, 1994; Olson & Lurigio, 2000; Spohn & Holleran, 2002; Whitehead, 1991). Thus, to control for the effects of demographic characteristics, the following variables were added as statistical controls:

Age (measured in years)

Sex (*male* = 0, *female* = 1)

Race/ethnicity (*White* = 0, *non-White* = 1)

Education status (*more than high school diploma or GED* = 0, *less than high school diploma or GED* = 1)

Marital status (*married* = 0, *not married* = 1)

Criminal history and substance abuse variables. Research has revealed that offenders with more severe criminal histories (e.g., greater number of prior convictions) or those convicted of certain types of crimes (e.g., drug offenses, property offenses, or violent offenses) are at greater risk for community supervision failure (Gray et al., 2001; Jones, 1995; Morgan, 1994; Spohn & Holleran, 2002). Similarly, studies have shown that offenders who have more extensive histories with drug and alcohol abuse are more likely to experience unsuccessful probation and parole outcomes (Benedict & Huff-Corzine, 1997; Gray et al., 2001; Olson & Lurigio, 2000; Whitehead, 1991). To account for the influence of criminal and substance abuse history on violation reoccurrence, the following variables were included:

Prior felony (*no prior felony* = 0, *prior felony* = 1)

Property offender (*no current property offense* = 0, *current property offense* = 1)[3]

Prior revocation (*no prior revocation* = 0, *prior revocation* = 1)

Drug involved (*not drug involved* = 0, *drug involved* = 1)[4]

Violation history. Violation history variables are measures of offender noncompliance while under ISP supervision. WDOC ISP policy identifies three types of offender noncompliance: low-risk violations, high-risk violations, and new-crime violations. The determination of whether the violation is considered high or low risk is ultimately made by the supervising agent based on a variety of factors including the seriousness of the transgression, the risk level of the offender, and the frequency of previous violations. Low-risk violations are considered less serious transgressions and might include behaviors such as arriving home 10 minutes past curfew or having contact with an unapproved visitor. High-risk violations are considered more serious transgressions and could include behaviors such as continued drug use or failure to attend required treatment. New-crime violations involve the commission of a new criminal act while under supervision. Not surprisingly, high-risk and new-crime violations are given more attention than low-risk violations and are the most likely to lead to revocation. Thus, the following two violation history variables were included in the analysis:

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High-risk violations (number of high-risk violations committed)

New-crime violations (*no new-crime violations* = 0, *new-crime violation* = 1)

INDEPENDENT VARIABLES

Three logistic regression models were used in this study. Below is a description of the independent variables included in each of these models.

Sanction model. The sanction model investigates the effect of punishment frequency on ISP completion. Thus, the following sanction variable was created: *sanction total* (number of sanctions received while on the WDOC ISP).

Reward model. The reward model examines whether the frequency of rewards received while on ISP is predictive of program completion. The following reward variable was included in the analysis: *reward total* (number of rewards received while on the WDOC ISP).

Ratio model. The ratio model examines whether the rewards-to-sanctions ratio is predictive of program outcomes. Prior research suggests that sanctions and rewards are most effective when used in concert (Gendreau, 1996; Marlowe & Kirby, 1999). The literature further reveals that behavioral interventions are most successful when the rewards-to-punishments ratio is high. More specifically, advocates often assert that correctional programs should strive to achieve a 4:1 ratio of rewards to punishments when working with offender populations (Andrews & Bonta, 1998; Gendreau, 1996). To explore the importance of the rewards-to-punishments ratio, two variables were examined: *behavioral total* (total number of behavioral interventions; sanctions + rewards) and *behavioral ratio* (proportion of rewards received in relation to total behavioral interventions; rewards ÷ [sanctions + rewards] × 100).

RESULTS

Descriptive analysis regarding the use of sanctions and rewards of WDOC ISP offenders is available in Table 3. The vast majority (80.2%) of offenders experienced at least one sanction while on the program, with the most common sanctions being program regression, removal of good time, and jail. Approximately 82% of offenders received at least one reward during their tenure. The most common types of rewards included level advancement, verbal praise, and approval of a special activity.

The results of the multivariate analyses are presented in Table 4. Three logistic regression models were used to examine the effects of sanctions and rewards on ISP success.

Sanction model. The sanction model explores the effect of punishments on ISP completion. The model chi-square was significant and the Nagelkerke R^2 reveals that the proportion of variation explained by the independent variables was .27 (see Nagelkerke, 1991). Three significant variables emerged: prior revocation, high-risk violations, and sanction total. More specifically, individuals who had previously experienced a revocation while under

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TABLE 3: WDOC ISP Sanctions and Rewards Descriptive Analysis

Sanction Experiences	n	%
Number of sanctions		
M	2.7	
Mdn	2	
Range	0–10	
Experienced ISP sanction		
Yes	227	80.2
No	56	19.8
Sanction type received		
Program regression	105	37.1
Take good time	97	34.3
Jail sanction	97	34.3
Verbal reprimand	70	24.7
Electronic monitoring	55	19.4
Community service	60	17.7
Outpatient treatment	41	14.5
Written assignment	18	6.4
Reduce PMT	16	5.7
Inpatient treatment	15	5.3
Community corrections	14	4.9
Reward experiences		
Number of rewards		
M	3.5	
Mdn	3.0	
Range	0–11	
Experienced ISP reward		
Yes	233	82.3
No	50	17.7
Reward type received		
Level advancement	206	72.8
Verbal praise	124	43.8
Special activity	98	34.6
Remove electronic monitoring	78	27.6
Increase PMT	37	13.1
Good time	22	7.8
Reduce ISP fees	6	2.1
Special visitation	4	1.4

Note. WDOC = Wyoming Department of Corrections; ISP = Intensive Supervision Program; PMT = personal maintenance time. Values are *n* and percentage unless otherwise noted.

community supervision and those who committed a higher number of high-risk violations were less likely to successfully complete the WDOC ISP than those who had not experienced a previous revocation and those with fewer high-risk violations. In addition, a positive relationship was observed between sanction total and ISP success, meaning that as the number of formal punishments received increases, so do the odds of successfully completing ISP. Finally, by focusing on the semistandardized coefficients for the significant variables, it is observed that high-risk violations were the most powerful predictor variable in the analysis, followed by sanction total and prior revocation.

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TABLE 4: Logistic Regression Models Predicting ISP Success

	Sanction Model				*Reward Model*				*Ratio Model*			
Variables	b	SE	*Exp*(b)	*Std.* b[a]	b	SE	*Exp*(b)	*Std.* b	b	SE	*Exp*(b)	*Std.* b
Age	0.001	0.017	1.001	0.011	0.040	0.025	1.041	0.424	0.028	0.023	1.028	0.297
Sex (male)[b]	0.090	0.343	1.094	0.042	0.271	0.459	1.311	0.126	0.042	0.436	1.043	0.020
Race (White)	–0.203	0.395	0.816	–0.078	0.256	0.537	1.292	0.098	0.356	0.495	1.428	0.136
Education (more than diploma or GED)	–0.266	0.372	0.766	–0.108	0.269	0.516	1.308	0.109	0.097	0.473	1.102	0.039
Marital (married)	0.361	0.379	1.435	0.151	0.719	0.502	2.052	0.301	0.738	0.481	2.091	0.309
Prior felony (no prior felony)	0.084	0.338	1.088	0.040	0.366	0.469	1.441	0.176	0.139	0.431	1.149	0.067
Offense type (nonproperty)	–0.518	0.320	0.596	–0.251	–0.377	0.439	0.686	–0.183	–0.080	0.409	0.923	–0.039
Prior revocation (no revocation)	–0.735*	0.327	0.480	–0.368	–0.409	0.441	0.664	–0.205	–0.104	0.423	0.901	–0.052
Drug use (no drug use)	–0.157	0.365	0.855	–0.071	–0.385	0.483	0.680	–0.174	–0.561	0.457	0.570	–0.253
High-risk violations	–0.938*	0.209	0.391	–1.210	–0.950*	0.189	0.387	–1.226	–0.766*	0.220	0.465	–0.988
New-crime violations	–0.656	0.400	0.519	–0.242	–0.484	0.513	0.616	–0.179	–0.343	0.469	0.710	–0.127
Sanction total	0.382*	0.115	1.465	0.898								
Reward total					0.410*	0.107	1.506	1.087				
Behavioral responses									0.231*	0.076	1.260	0.848
Behavioral ratio									0.050*	0.008	1.051	1.726
Constant	0.601	0.824	1.824		–0.579	1.142	0.560		–3.381	1.167	0.034	

Note. ISP = Intensive Supervision Program; GED = general education development; WDOC = Wyoming Department of Corrections. Sanction model: $n = 227^{c}$, model $\chi^2 = 50.27^*$, Nagelkerke $R^2 = .27$. Reward model: $n = 233^{c}$, model $\chi^2 = 86.39^*$, Nagelkerke $R^2 = .46$. Ratio model: $n = 283$, model $\chi^2 = 184.51^*$, Nagelkerke $R^2 = .66$.
a. Semistandardized coefficients are calculated by multiplying the *b* coefficient times the standard deviation of the corresponding independent variable.
b. Label in parentheses reflects reference category for dichotomous variables.
c. As the purpose of these analyses was to isolate the effects of the sanctions and rewards on offenders who experienced them firsthand, offenders who received no sanctions on ISP were excluded from the sanction model and those who experienced no rewards were excluded from the reward model.
$^*p < .05$.

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Figure 1: Ratio of Rewards to Sanctions and the Predicted Probability of Intensive Supervision Program Success

Reward model. The reward model examines the influence of incentives on ISP success. Model statistics show that the model is significant. Furthermore, the R^2 reveals that the proportion of variation explained was .46, which is substantially higher than the previous model. Only two variables achieved statistical significance, high-risk violations and reward total. Consistent with the previous model, a negative association between high-risk violations and program success was revealed. As the number of high-risk violations increased, the odds of ISP completion declined. A positive relationship between reward total and ISP success was observed. More specifically, a one-unit increase in the number of reinforcements received corresponded with a 50% increase in the odds of program success.

Ratio model. The ratio model examines whether the rewards-to-sanctions ratio is predictive of program completion. The chi-square is significant, and an R^2 value reveals the largest proportion of explained variation (.66) of any of the models tested. Three variables, high-risk violations, behavioral responses, and behavioral ratio, achieved statistical significance. As observed in the previous models, a negative relationship between high-risk violations and program completion was observed. A positive relationship between behavioral responses and ISP success was revealed, meaning that as the combined number of sanctions and rewards increased, the odds of program completion were enhanced.

The most powerful predictor variable in the analysis was the ratio variable. As the reinforcers-to-punishers proportion widened, the odds of program success improved. To better illustrate this finding, predicted probabilities of program completion were calculated using the logistic regression results.[5] This has been a technique used by researchers to aid in the difficult process of interpreting logistic regression coefficients (Roncek, 1991). In the current analysis, the probabilities of program success were calculated at varying rewards-to-punishments ratios while holding the other two statistically significant variables, high-risk violations and total behavioral responses, constant at their respective sample means (1.46, 6.14). These probabilities are presented in Figure 1.

Figure 1 reveals that individuals who experience a greater amount of punishments in relationship to incentives have a low likelihood of completing the WDOC ISP. For instance, the probability of an offender completing ISP with a 1:4 reward-to-punishment ratio is approximately 11%. The probability of success is substantially enhanced, however, when

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the ratio of rewards to punishments increases. Individuals who experience a 4:1 reward-to-punishment ratio have more than a 71% probability of completing the program.

The *S*-shaped curve observed in Figure 1 also indicates that the most substantial increases in the probability of program completion occur as the ratio shifts from a majority of punishments approach to a majority of rewards approach. For example, those individuals with a 1:2 reward-to-punishment ratio have an approximate 19% predicted probability of successful program completion. This probability of success increases substantially to approximately 36% with a 1:1 ratio and shows another substantial increase to almost 57% when rewards outnumber punishments at a 2:1 ratio. Once the proportion of rewards to punishments reaches the 4:1 ratio, the growth in the probability of success begins to stabilize.

DISCUSSION

Three clear themes emerge from the study findings. These findings have important implications for the supervision practices of community-based correctional organizations. The first involves the use of sanctions to improve supervision outcomes. Multivariate findings revealed a positive relationship between sanctions received and the likelihood of program success, meaning that as the number of sanctions imposed increases so does the likelihood of completing ISP.

From a supervision perspective, our findings support the need to consistently hold offenders accountable for their transgressions. This finding is consistent with prior behavioral research showing that punishments are most effective in controlling unwanted behavior when administered for every infraction (Arzin & Holz, 1966; Lester et al., 2004; Marlowe & Kirby, 1999). It is imperative, therefore, that correctional agencies assess current policies and practices to better ensure consistency in delivering sanctions. This may involve increasing the capacity of line staff to impose sanctions on recalcitrant offenders. It may also require changes in policy to limit the discretion of supervision personnel in making sanctioning decisions to limit variation when handling violations. A number of jurisdictions have incorporated sanctioning guidelines to structure responses to offender noncompliance (Burke, 1997, 2004).

It is imperative to note that although our study findings support consistency in sanctioning, they do not speak to the nature of the punishment imposed. Stated differently, it may be that if consistent sanctioning is combined with excessively severe punishments, adverse unintended consequences may result. Behavioral research has shown that punishments used in an extreme or haphazard manner often create undesirable results, such as the learning of aggression or the triggering of escape behavior (Marlowe & Kirby, 1999; Myers, 2001). Therefore, it is foreseeable that sanctions, if applied in a reckless manner, can have detrimental effects on supervision outcomes.

The second important finding stems from the effect of rewards on program outcomes. The positive correlation observed between the frequency of reinforcements and the odds of program success supports the need for community corrections professionals to reward offender compliance. Furthermore, the greater proportion of explained variation between the sanction model (Nagelkerke $R^2 = .27$) and reward model (Nagelkerke $R^2 = .46$) suggests that the application of rewards holds more promise for improving program success than the

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use of sanctions. Thus, it is essential that correctional agencies explore ways to encompass the use of reinforcements into their supervision strategy. The WDOC, for example, is experimenting with a reinforcement guideline system to improve consistency in the reinforcement of prosocial behavior.

Incorporating the use of reinforcements into the management of offenders in the community in a meaningful way will likely require more than simple policy changes but will necessitate a paradigmatic shift in supervision philosophy. Contemporary supervision practices emphasize surveillance and control over more traditional objectives of assisting offenders in their rehabilitation (Feeley & Simon, 1992; Garland, 2001). Within this surveillance-oriented paradigm, attention is focused on detecting and punishing offender misconduct rather than recognizing and rewarding prosocial accomplishments. Thus, organizational efforts to integrate rewards into community supervision without first addressing ideological impediments will be superficial at best.

The final theme emerging from this research involves the importance of using rewards and punishment in concert. The ratio model was the most robust of the three models (Nagelkerke $R^2 = .66$), which is consistent with previous behavioral research showing that punishments and rewards are most effective when used in tandem (Arzin & Holz, 1966; Marlowe & Kirby, 1999). This suggests that offender management strategies that incorporate both sanctions for noncompliant behavior and rewards for conforming behavior will be most effective in improving supervision outcomes.

The study's findings further support the need to use a proportionally higher number of rewards to sanctions in the supervision of ISP offenders. As noted in Figure 1, the probability of completing ISP increases substantially as the rewards-to-punishments ratio grows until a 4:1 ratio is achieved. At this point, increases in the probability of completion sharply diminish. Achieving a 4:1 ratio is widely promoted in the offender program literature as a way to maximize desired outcomes (e.g., Andrews & Bonta, 1998; Gendreau, 1996; Lester et al., 2004). The salience of maintaining a high reinforcements-to-punishments ratio has also been supported in behavioral research on classroom management and child rearing (Cavell, 2001). Probation and parole supervisors are therefore encouraged to closely train, monitor, and guide officers so that rewards are distributed in proportionally higher number than punishments.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The current study supports the efficacy of sanctions and rewards in improving offender supervision outcomes. These findings reinforce calls by prominent academics for correctional agencies to incorporate operant learning-based interventions into the management of offenders in the community (Andrews & Bonta, 1998; Gendreau, 1996; Petersilia, 2007). It is important to recognize, however, that the current study possesses certain limitations that should be addressed in future research to provide ongoing guidance to policy makers and practitioners in their efforts to incorporate behavioral strategies into supervision practices.

First, caution should be taken when generalizing the results of this study to other community corrections populations. It is important to recognize that the offender population from which the sample is drawn may not be representative of the national community cor-

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rections population. This specific sample, for example, is made up of mainly White offenders (78.5%). National statistics by contrast show that ethnic- and racial-minority offenders make up a substantial proportion of offenders under community supervision (Glaze & Bonczar, 2009). In addition, it should be noted that the study was composed of offenders residing in a very rural state lacking the urban environment found in other jurisdictions. There is also reason to believe that the study sample is composed of a higher concentration of offenders who are more likely to experience successful community corrections outcomes. When compared to national statistics on the community corrections population, offenders in the study sample were more highly educated and had less severe criminal histories (Bonczar, 1997; Harlow, 2003). Prior research on predictors of community corrections success has shown that offenders who exhibit these characteristics are more likely to successfully complete their supervision (Morgan, 1994). Although the effect of these differences on study outcomes is unclear, efforts should be made to undertake behavioral research with more varied offender populations.

A second limitation of the current study is the inability to control for certain contextual factors that might influence supervision outcomes. The decision of a supervising agent to pursue revocation is often highly discretionary and can be influenced by a variety of factors (Clear et al., 1992; Kerbs, Jones, & Jolley, 2009; McCleary, 1975). Studies have revealed that officer-level characteristics such as gender, race, and supervision philosophy may influence decisions to pursue revocation in certain situations (Kerbs et al., 2009; McCleary, 1975). Research has also shown a relationship between decisions to purse revocation and organizational factors such as agency size, supervisor expectations, and organizational norms (Clear et al., 1992; Kerbs et al., 2009; McCleary, 1975). In addition, it should be noted that revocation decisions can be shaped by outside political forces that influence both individual and organizational responses to offender noncompliance (Grattet et al., 2008). A brutal crime committed by an offender under community supervision, for example, may result in political pressure that causes individual officers to be less tolerant of offender transgressions. This same political pressure may also bring about agency-level policy changes that dictate more rapid termination of noncompliant probationers and parolees. Thus, it is imperative for future studies to incorporate these contextual variables into the research design to explore the potential ways in which the effectiveness of sanctions and rewards may be influenced by these factors.

The present study is also limited by its inability to explore the capacity of specific types of rewards and sanctions to bring about desired outcomes. Behavioral interventions are subjective in nature, meaning that what might be rewarding to one might be punishing to another (Marlowe & Kirby, 1999). There is a need, therefore, to continue research to better understand how offenders perceive various types of reinforcements and punishments to assist line staff in administering these interventions in an effective manner (Wodahl, Ogle, Kadleck, & Gerow, in press).

Despite the above limitations, this research provides good reason to be optimistic about the capacity of behavioral interventions to improve supervision outcomes. More specifically, the current study supports the use of combining sanctions and rewards as a tool to improve compliance with release conditions. Perhaps the most interesting finding involves the efficacy of administering a proportionally higher number of rewards to sanctions. Correctional administrators are encouraged to identify ideological obstacles that may impede the application of behavioral techniques and to carefully train and guide line staff in the use of sanctions and rewards.

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NOTES

1. Wyoming Department of Corrections Intensive Supervision Program (ISP) agents supervise a mixed caseload of both probationers and parolees. Thus, both groups of offenders receive the same level of supervision and are subject to the same conditions and restrictions regardless of the nature of their release-granting authority.

2. The original target sample size for this project was 300 ISP offenders. However, because of missing data, 17 cases had to be dropped from the analyses, leaving a total sample size of 283. The target sample size of 300 offenders was identified primarily for pragmatic reasons. Although it would have been ideal to include all 1,382 offenders in the analysis, time and resource limitations made this impossible as much of the data had to be manually extracted from offender supervision files.

3. The inclusion of this variable was based largely on preliminary bivariate findings, which revealed that property offenders were the type most prone to experiencing program failure.

4. Department policy defines a drug-involved offender as any offender who has used illicit drugs within 5 years of intake to supervision.

5. The effects of the statistically significant independent variables on the change in probability of the dependent variable can be calculated using a two step approach (Roncek, 1991; see also Mertler & Vannatta, 2005; Kim, Joo, & McCarty, 2008). The first step involves using the natural logarithm of the predicted value of the odds (Equation 1). The second step entails transforming the odds to a probability by exponentiating the equation in the first step (Equation 2). In this case, the probability of ISP success for someone with a 4:1 ratio of rewards to punishments (or a behavioral ratio of 80), 1.46 high-risk violations (the sample average), and 6.14 behavioral responses (the sample average) can be calculated as follows:

Step 1.

$$\ln\left(\frac{\dot{p}}{1-P}\right) = a + b_1 * X_1 + b_2 * X_2 + b_3 * X_3 + \cdots \tag{1}$$

$$= -3.381 + .050*(80) - .766*(1.46) + .231*(6.14)$$

$$= 0.919$$

Step 2.

$$\mathrm{P} = \frac{e^{\Sigma b_i x_i}}{1 + e^{\Sigma b_i x_i}} \tag{2}$$

$$\mathrm{P} = \frac{e^{.919}}{1 + e^{.919}}$$

$$\mathrm{P} = .715*100 = 71.5\%$$

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