



## Victims & Offenders

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# Does GPS Improve Recidivism among High Risk Sex Offenders? Outcomes for California’s GPS Pilot for High Risk Sex Offender Parolees

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**Abstract:** The supervision and monitoring of sex offenders has been one of the most hotly contested areas in corrections policy in recent years. The public has called for greater levels of offender scrutiny as the result of heinous acts perpetrated by sex offenders, while critics point to recent legislation with onerous housing restrictions coupled with public censure that prevent many offenders from reentering successfully into society. The current study provides a test of the effectiveness of GPS monitoring for high risk sex offender parolees over and above surveillance and monitoring provided by specialized sex offender caseloads. Using data from a GPS pilot program, 94 high risk sex offenders monitored by GPS and 91 high risk sex offenders on specialized caseloads were followed for 12 months. GPS sex offenders were less likely to be found guilty of failing to register as non-GPS sex offenders and marginally less likely

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to abscond—reflecting relative success in meeting two goals of sex offender legislation—knowing where sex offenders are and making sure they are registered. Additionally, GPS offenders were less likely to be found guilty of committing a new criminal violation; however we observed no significant differences in the type of new crime violation.

**Keywords:** electronic monitoring, GPS, parolees, sex offenders

## INTRODUCTION

Currently more than 7.1 million people are under correctional supervision in the United States (Bureau of Justice Statistics, 2011). Sex offenders comprise a small proportion of the overall offender population—approximately 3% of probationers and 8% of parolees have a sex crime as their most serious offense (Glaze & Bonzcar, 2011). Yet, despite their relatively small numbers, the sex offender population has been front and center in public policy discussions over the past decade, largely due to high-profile crimes and public concern that sex offenders are likely to reoffend while in the community (Cohen & Jeglic, 2007).

Sex offender supervision in the community has been largely guided by a series of laws, often resulting from high-profile cases, which have increasingly restricted the movements of these offenders living in the community. Federal legislation has played an important part. For example, the federal Sexual Offender (Jacob Wetterling) Act of 1994 required sex offenders to provide local law enforcement agencies with their current address for inclusion in a publicly available statewide sex offender registry (Levenson & Cotter, 2005; Levenson & Hern, 2007). The Wetterling Act was later enhanced by the passage of Megan's Law, which mandated that states develop and implement a mechanism to notify the public about sex offenders living in the community (Levenson & Cotter, 2005). In 2006, the Adam Walsh Child Protection and Safety Act added new elements to sex offender registration, established a federal sex offender management office, and provided grants to states to improve registration and meet the new requirements.

At the state level, Jessica's Law (the informal name given to sex offender legislation in many states) has greatly influenced the treatment of sex offenders. Initially passed in Florida in 2005 (HB 1877), the law sought to protect children from sexual predators through expanded registration requirements, establishing mandatory minimum sentences, and the use of electronic monitoring to track and report the location of sex offenders (Levenson & D'Amora, 2007).

In November 2006, California voters overwhelmingly approved the state's own version, the Sexual Predator Punishment and Control Act: Jessica's Law, known as Proposition 83. The passage of Prop 83 resulted in nearly 400 changes to existing California law, affecting the manner in which sex offenders are sentenced, released, and monitored in the community (Boyd,

2008; California Sex Offender Management Task Force, 2007). These changes, among other things, made existing laws governing the movement of sex offenders in the community more restrictive, included a requirement that convicted sex offenders be monitored using GPS during probation or parole, and required that all registered<sup>1</sup> felony sex offenders be monitored by GPS for life following discharge from community supervision (California Sex Offender Management Task Force, 2007; National Conference of State Legislatures, 2009). In addition, Prop 83 prohibited sex offenders from residing within 2,000 feet of any school, park, or other place where children congregate, and allowed local jurisdictions the discretion to implement residency requirements for released sex offenders that are even more restrictive (California Sex Offender Management Board, 2008).

The problem, however, was that Prop 83 was passed without a plan for how it would be implemented statewide or clear empirical evidence that the use of GPS monitoring would reduce reoffending among sex offenders in the community—and ultimately, increase public safety. Despite these considerations, the California Department of Corrections and Rehabilitation (CDCR) had already begun to use GPS technology to monitor sex offenders. In June 2005, CDCR launched a pilot program to investigate the efficacy of GPS monitoring on high risk sex offenders (HRSO) in San Diego County. Using data from the pilot, this study examines the effectiveness of GPS monitoring on HRSO supervised in the community. Our analysis examines and compares outcomes for both sex offenders monitored by GPS and a comparison group of HRSO from the same parole units on technical violations, convictions, and returns to custody. This is one of the first studies examining the effectiveness of GPS solely on sex offenders and fills an important research gap with respect to the use and effectiveness of GPS monitoring for HRSO.

## **SEX OFFENDERS: RECIDIVISM RATES AND PUBLIC SAFETY CHALLENGES**

Sex crimes are particularly harmful to victims and raise fear and concern among community members and society as a whole. Given this heightened concern, the supervision of sex offenders in the community plays a critical role in efforts to increase public safety and reduce the number of sex crimes committed by known sex offenders. The extent to which convicted sex offenders continue to perpetrate sexual crimes after they have been released to the community is uncertain. A recent study conducted by the Bureau of Justice Statistics (BJS) examined the recidivism rates of known sex offenders released from prison in 15 states (including California) and found that 43% were rearrested for some type of crime within three years of release, of which 5.3% were rearrested for a new sex crime (Langan, Schmitt, & Durose, 2003). By comparison, the rearrest rate for non–sex offenders for any type of crime was much

higher, 68.4%—although only 1.3% were arrested for a new sex crime (Langan et al., 2003).

Sex offenses, however, are generally underreported, which is a major factor when considering the accuracy and reliability of reported reoffense rates among sex offenders. Consequently, the actual rate of recidivism is generally underestimated in official crime reports (Kilpatrick, Saunders, & Smith, 2003; Smith et al., 2000; Tjaden & Thoennes, 2006), suggesting that the results reported in the BJS study, which rely exclusively on official crime data, likely represent the minimum level of recidivism. Other research findings indicate that recidivism rates for sex crimes among sex offenders might be slightly higher. A series of meta-analyses examining the sex crime recidivism rates among sex offenders after five years found a rate of approximately 13%, while the recidivism rate for non-sex offenses was about 36% (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005). The higher levels of sex offense recidivism reported in these studies might be attributed to longer follow-up periods and the use of self-report data in a portion of the studies used in the analysis.

Furthermore, some types of sex offenders might have much higher rates of sexual recidivism compared to others. Research estimates that the sexual recidivism rates of certain HRSO<sup>2</sup> could be at minimum 50% and as high as 70–80% (Hanson, 1998). Additional research has attempted to identify characteristics, either static or dynamic, that can be used to predict the likelihood that an individual will reoffend. Sexual deviancy and antisocial attitudes have been found to be the strongest predictors related to sexual recidivism (Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005). Nonetheless, the potentially higher rates of sexual recidivism among certain types of sex offenders might merit additional surveillance tools, such as GPS.

Both the detection and frequency with which sex offenses occur within the sex offender population are difficult to tease apart. To this end, GPS technology has been utilized in an effort to alleviate some of the challenges associated with the supervision of sex offenders. One advantage of utilizing GPS as a supervision tool is that it might increase the detection of violations by providing law enforcement with real-time information regarding the location and movements of sex offenders; this might enhance the accuracy of both sex offender supervision and sexual reoffending rates. Furthermore, awareness among sex offenders that their whereabouts are tracked more closely might also deter criminal behavior. These additional restrictions might reduce the proclivity of sex offenders to reengage in sexual (as well as nonsexual) reoffending.

## **GPS Monitoring of Sex Offenders**

A major component of Prop 83 was a requirement that all convicted sex offenders be monitored by GPS during their period of probation or parole

to more closely track their whereabouts. GPS monitoring is a tool used by law enforcement to collect data on offenders from a distance by pinpointing and recording an offender's exact location, allowing an offender's movements to be tracked over time (DeMichele & Payne, 2009). There are three types of GPS monitoring commonly used for sex offenders: active, passive, and hybrid systems (Brown, McCabe, & Welford, 2007; DeMichele & Payne, 2009; International Association of Chiefs of Police, 2008). Active GPS is the most aggressive form of monitoring in which data points capturing offender location information are transmitted almost instantaneously. Active GPS is based on cellular technology, which also has the capability of alerting law enforcement if an offender has tampered with the device or has moved out of range or into a restricted location.<sup>3</sup> Passive GPS units record location and time data and transmit it once daily, so review of offender movements is retrospective. Data are transmitted much like traditional electronic monitoring devices, where the system is placed in a docking station that is connected to a telephone landline. Officers will generally take action against any alerts within 24–48 hours of the event. Finally, hybrid systems use a combination of both active and passive GPS, where data points are transmitted every few hours; if the system is tampered with or an offender moves out of range or into a restricted area, law enforcement will be alerted immediately.

Although the use of GPS and electronic monitoring of sex offenders has been widely implemented, there is limited empirical support for its use (Conway, 2003; National Conference of State Legislatures, 2012; Renzema & Mayo-Wilson, 2005). Only a handful of studies have examined the efficacy of GPS on sex offender recidivism. For example, an examination of the use of GPS on 250 sex offenders in New Jersey found that, after one year, only one GPS-monitored sex offender had committed a new sex crime, and 19 had committed a new nonsex crime; however, the lack of a control group in the evaluation limits the assessment of the overall deterrent effect of GPS on this population (New Jersey State Parole Board, 2008). A GPS pilot project in Tennessee, similar to the San Diego pilot, found no statistically significant differences between GPS-monitored sex offenders and a comparison group of sex offenders with regard to parole violations, new criminal charges, or the number of days prior to the first violation (Tennessee Board of Probation and Parole and Middle Tennessee State University, 2007). Finally, a recent statewide evaluation of GPS for HRSO in California contrasted implementation and outcomes with offenders under routine parole supervision. Gies et al. (2012) found that the GPS program was implemented with fidelity and resulted in reductions in sex violations, new arrests, and returns to custody.

Other studies have examined the use of GPS as part of wider evaluations of electronic monitoring (EM) in general. Padgett, Bales, and Blomberg (2006) examined the use of EM, including GPS, among a large sample of high risk offenders in Florida. The study, which included offenders convicted of

sex offenses, found that the use of EM—including GPS—reduced the likelihood of committing a technical violation and absconding from supervision by more than 90%, and reduced the likelihood of committing a new offense by more than 94% relative to a comparable group of non-EM participants. A more recent study by Bales and colleagues (Bales et al., 2010) of EM (including GPS) for medium and high risk offenders in Florida revealed that EM reduced the risk of failure by 31% and GPS reduced the risk of recidivism by 6% compared to radio frequency EM. While not examining GPS specifically, Finn and Muirhead-Stevens (2002) investigated the use of EM on a group of violent male parolees in Georgia. The study found that EM was useful for some specific types of offenders, such as sex offenders. Sex offenders were less likely to recidivate when on EM compared to other violent offenders. A limitation of prior studies examining the use of GPS is their failure to rigorously examine its effects on sex offenders exclusively. Despite inconsistent research findings regarding the utility of GPS on parolees in general, and sex offenders in particular, GPS technology is being increasingly implemented in jurisdictions across the United States. A strength of the current study is its exclusive focus on HRSO, for which GPS technology might be most useful.

### **Sex Offender Residency and Movements**

Monitoring sex offenders through GPS allows law enforcement to ensure they are complying with residency restrictions, which are designed to prevent sex offenders from living in areas that are in close proximity to potential targets. Monitoring sex offender compliance with residency restrictions has been cited as an important factor in deterring further sex offenses among this population. However, recent evidence suggests that the neighborhood characteristics of where sex offenders live may have little relationship with a propensity to commit future sex offenses. Although some research has found that registered sex offenders are likely to live in neighborhoods located near a pool of potential targets—such as schools, day care centers, and parks (Walker, Golden, & Van Houten, 2001)—other research has found that sex offenders are unlikely to commit a new offense close to home (Colorado Department of Public Safety, 2004; Minnesota Department of Corrections, 2003). For example, Tewksbury, Mustaine, and Stengel (2008) found no relationship between the concentration of sex offenders in a particular neighborhood and the number of sex offenses in the community. Furthermore, sex offenders who live in close proximity to schools or day care centers may be no more likely to reoffend compared to sex offenders who do not live close to these areas (Colorado Department of Public Safety, 2004).

If sex offenders are not committing sex offenses within their own neighborhoods, this implies that they may be traveling to potential targets, and these targets may be located in the surrounding areas or neighborhoods. The use

of GPS would enable law enforcement to track the movements of offenders, potentially deterring new sexual offenses by decreasing opportunities through increased supervision. Routine activities theory (Cohen & Felson, 1979) suggests that monitoring the movements of daily activities of sex offenders by GPS would be effective. According to routine activities theory, crime will occur when a motivated offender encounters a suitable target in the absence of a capable guardian; these are most likely to occur as offenders go about their routine activities. Similarly, crime pattern theory focuses on the regular activities of both offenders and targets and implies that offenders will be cognizant of a greater number of opportunities in and between locations traveled with greater frequency (Brantingham & Brantingham 1993, 2008). A central goal of GPS and other forms of electronic monitoring is to track the movements and location of an offender, and to deter an offender from traveling to a location where potential victims may be located. The imposition of GPS increases guardianship and might disrupt movements by restricting when and where an offender can go, thereby reducing the potential for criminal opportunities.

Tracking offender movements is particularly relevant given research findings which suggest that sex offenders travel varying distances to engage in sexual crimes (Barker, 2000; Bernasco, 2006; Bernasco & Block, 2009; Brantingham & Brantingham, 1993, 2008; Brown, 1982; Rengert, Piquero, & Jones, 1999). For example, White (1932) found that the mean distance to crime for rapists was 1.52 miles compared to 1.72 miles for property crimes. More recently, Rengert and colleagues (1999) found that rapists traveled approximately 1.15 miles compared to 1.62 for burglars and 2.1 miles for robbers. There is also evidence that certain types of sex offenders will travel great distances to locate victims; “confrontational offenders” seek offending locations where they are unlikely to be recognized and subsequently apprehended (Duwe, Donnay, & Tewksbury, 2008). Other studies have found that certain types of sex offenders might target their victims in a different city (Rossmo, 2000) —areas with which they are still familiar, but where they will be less recognizable. If repeat sex offenders travel away from home in an effort to avoid recognition as some have suggested (Levenson & Cotter, 2005), then the use of GPS should compromise this sense of anonymity, since the device, not an individual, will place them in the offending location.

The current study investigates the utility of GPS monitoring for HRSO. It is important to note that this study compares the *value added* of the GPS technology to small, specialized caseloads. It is not a comparison to routine supervision parole for sex offenders.<sup>4</sup> More specifically, we examine whether GPS is effective in terms of reducing violations for supervision conditions as well as new criminal behavior and returns to custody among HRSO. Given the relative uncertainty of the effectiveness of GPS monitoring on sex offenders, this study fills an important gap in the literature, particularly as the number of states requiring this type of monitoring continues to increase.



## STUDY DESIGN

### Constructing Study Groups

California focuses supervision and monitoring of sex offenders on those determined to have the highest risk of sexual reoffending. In California, HRSO are defined as those whose commitment offense was sexual or related to an established pattern of deviant sexual behavior, who victimized one person over a long period of time (multiple counts), evidenced same sex pedophilia, or committed acts against multiple victims. Sex offenders were assessed prior to their release from prison by an HRSO agent or supervisor using the Risk Evaluation Form (Appendix A). Sex offenders who were identified as at high risk to reoffend were placed on an HRSO caseload. Approximately 1,900 of the almost 9,000 sex offenders on parole in the state were classified as HRSO at the time of our study.<sup>5</sup> In our study site, HRSO parolees were supervised more intensively as part of small, specialized caseloads. While an average parole caseload in California consisted of approximately 70 parolees, an HRSO caseload consisted of approximately 40 parolees at the time of this study.<sup>6</sup>

The GPS pilot was implemented in San Diego County using four existing HRSO caseloads.<sup>7</sup> After a parolee was identified as a HRSO parolee, additional factors were supposed to be used in a secondary screen to determine if he/she should be placed on GPS monitoring. These included a parolee's combined score on the Static-99,<sup>8</sup> the amount of time since his or her most recent release from prison (the closer the parolee was to a release date, the higher the score), and parole agent assessment. In each of the four HRSO caseloads, the 20 parolees deemed higher risk (e.g., higher Static-99 scores, closer to release date, and higher agent assessment score) were supposed to be enrolled in GPS monitoring, while the remaining HRSO parolees were to be transferred to one of two new HRSO caseloads for intensive supervision. In practice, this was not followed. Static-99 scores were not routinely available for sex offenders at the time of assignment, and (as we show below) scores for the GPS and regular HRSO groups were indistinguishable from each other. GPS was to be used for offenders recently released from prison. Analyses revealed that, in fact, there were no significant differences between GPS and regular HRSO parolees in terms of days since release from prison (302 for GPS and 354 for comparison,  $p = 0.274$ ). We were able to take advantage of this administrative "slippage" in the creation of comparable study groups.

A total of 80 GPS units were available to be used at any time throughout the course of the pilot. When parolees were removed from the GPS caseload, either due to successful completion of parole or revocation, the parole agent selected a parolee from the HRSO caseload for placement on the available unit. For each GPS parolee, the follow-up started at placement onto GPS and continued for 12 months. Additionally, agents were given some discretion

to move parolees on and off the units to accommodate case flow. A total of 94 HRSO parolees were placed on GPS<sup>9</sup> between June and November 2005, and 91 HRSO parolees were used as a comparison group during that same time period. The follow-up period for both groups for our analysis was 12 months.

One pilot implementation issue is relevant to the composition of GPS and comparison groups. As noted above, as parolees in the GPS group were either discharged or removed from GPS parole, some HRSO parolees in the comparison group were placed on the devices. While this presented potentially challenging methodological issues for the study, in practice the comparison group was largely kept off GPS monitoring for the one-year study period used in our analysis. Eleven parolees in the comparison group were placed on GPS at some point during the study period, some for several months at a time. We include these offenders in their initial group assignment for analyses, following an “intent-to-treat” analysis strategy. This is a more conservative approach than dropping the “cross-overs.” Study results were substantively the same whether or not the “cross-overs” were included or excluded from the analyses. For the interested reader, we include appendix tables for outcomes in which we drop the “cross-overs” and the one female HRSO offender, who might be seen as an anomaly. On occasion, we refer to these results in our discussion of findings.

The CDCR’s pilot program utilized an active GPS monitoring system. Parolees wore a one-piece ankle unit, which took a data point every minute and transmitted the location of the parolee and data approximately every ten minutes. If there was an urgent event (e.g., strap tamper, zone violation), the unit transmitted an immediate notification.<sup>10</sup> GPS agents also utilized software which allowed them to view the “tracks” or movements of a parolee at any given time over any period of time. All other aspects of supervision and treatment were designed to be the same for both HRSO parolees and GPS supervised parolees.

## Data Collection

Detailed information was gathered for each GPS and comparison HRSO parolee. Background characteristics were collected from several sources. Information about a parolee’s prior criminal history was obtained by reviewing criminal histories or “rap sheets.” For each arrest entry on the rap sheets, information was extracted regarding the arrest date and charges, disposition date and charges, and sentence (e.g., length and type of sentence), as well as any information regarding jail or prison terms served. Parolee case files were used to obtain information regarding parolee demographics, employment, education, substance abuse, marital status and children, living arrangements, terms and conditions of parole, and (when available) Static-99 scores.<sup>11</sup> Parolee files were also reviewed for information regarding the date and nature of parole

agent contacts (e.g., home visits, office visits), treatment referrals and participation, parole violations and new arrests, housing, employment, romantic relationships, and drug testing and drug use. This information was collected for the first six months of follow-up. Information was also extracted from the Revocation Scheduling and Tracking Systems (RSTS), which documents parole violations and revocations, for the 12 months of follow-up.

## RESULTS

### Comparing GPS Parolees and High Risk Sex Offenders in the Study Group

To measure the effectiveness of GPS monitoring on sex offender behavior, it is important to compare parolees participating in the GPS program against a group of sex offenders with similar characteristics who were not enrolled in the GPS pilot. A randomized experimental design in which participants had an equal probability of being assigned to either a GPS caseload or a traditional HRSO caseload would have been optimal, as between-group differences could be directly attributed to GPS and not preexisting background differences between the two groups (e.g., offense history, drug use). Since a randomized design was not possible, the GPS and comparison groups need to be examined to determine whether significant between-group differences exist.

Detailed characteristics of the GPS group and HRSO comparison group are displayed in [Table 1](#) (for ease of reference, the HRSO group will subsequently be referred to as the “comparison” group). For virtually all measures, comparison group and GPS parolees did not differ. Both groups were predominately male, with one female participant in the GPS group. The majority of participants in both the GPS and comparison groups were white and non-Hispanic. Although a majority of participants had been married and over half had children, only about 24% were married at the time of the study period. Over two-thirds of participants had at least a high school degree. A majority of participants were over 40 at the time of their most recent incarceration. More than half were living in a single room occupancy (SRO) or hotel, and more than 60% were employed. Participants were also scored on the Static-99. The average score of 3.7 indicates a medium risk level, although both the comparison and GPS groups contained low and high Static-99 risk offenders; GPS and comparison groups were nearly identical on this measure.

The only statistically significant difference between the two groups was with respect to age at first arrest. Offenders in the comparison group had been arrested at a mean age of 32 while GPS participants on average were arrested at the age of 36. However, there were no significant differences with respect to the number of times participants had been arrested. GPS parolees were slightly less likely to be African American and less likely to have drug use

**Table 1:** Background characteristics of GPS and comparison parolees.

Characteristic	Group	
	Comparison (N = 91) (%)	GPS (N = 94) (%)
Sex		
Male	100.0	98.9
Ethnicity		
African American	31.8	26.6*
Hispanic	17.0	11.8
White non-Hispanic	50.0	52.7
Other/Unknown	1.1	8.6
Marital Status		
Never married	39.3	35.7
Divorced	34.5	42.9
Married	26.2	21.4
Have Children		
Yes	58.8	67.5
Education		
Less than high school	29.6	25.3
High school or GED	39.5	48.4
College	30.9	26.4
Drug Use		
No drug use	13.8	17.8*
Some/occasional drug use	17.2	30.0
Frequent drug use	26.4	15.6
Drug abuse/dependency	42.5	36.7
Mean Age at First Arrest	31.6	35.7**
Mean Number of Arrests	8.1	6.2
Age at Imprisonment		
20-29	9.3	7.8
30-39	26.7	18.9
40-49	31.4	35.6
50-59	24.4	27.8
60-69	8.1	7.8
70+	0.0	2.2
Mean Age at Imprisonment	43.4	45.4
Living Arrangements†		
Rooming house/SRO/Motel	54.5	64.6
Residential: live alone	10.4	13.4
Residential: w others	26.0	17.1
Treatment facility	9.1	4.9
Current Employment†		
Employed	63.0	60.5
Static-99 Risk Category		
Low (0-1)	16.7	18.5
Medium low (2-3)	38.1	33.7
Medium high (4-5)	23.8	27.2
High (6+)	21.4	20.7
Mean Static-99	3.7	3.7

p-values for significance tests based on Fisher's Exact and Student's t Tests.

Note: \* = comparison and GPS different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

†Parole files were not available for 3 comparison group parolees and 1 GPS parolee. In addition, complete data were not available for living arrangements and employment. For living arrangements, there were a total of 77 comparison and 82 GPS with data; for employment, there were 73 comparison and 81 GPS with data.

problems, but the differences were not statistically significant. Consequently, despite the fact that study participants were not randomized into groups, there were few differences between the comparison and GPS groups, as indicated by the background characteristics presented in [Table 1](#). The relative comparability between the two groups reduces one of the primary threats to internal validity of our analysis.

[Table 2](#) presents additional information on the prior criminal record of study participants abstracted from offender criminal histories, or “rap sheets.” Prior record was defined as prior arrests and their dispositions prior to the arrest for the offense for which participants were incarcerated. Nearly three-quarters of both GPS and comparison group participants had been arrested prior to their current offense. There were no significant differences between the groups regarding the types of offenses which they had committed previously, with the exception of property crimes and drug offenses. Comparison group parolees were significantly more likely to have had prior arrests, convictions, and prison terms for property offenses and more likely to have been sentenced to prison for a drug offense (as we describe later, we consider these variables in our regression analyses).

The criminal history of both GPS and comparison group parolees demonstrate that many study participants were recidivists. While over half had been arrested for a prior sex offense, the prior records of participants reveal that their past crimes were not limited to sex offenses—many parolees had also committed person, property, and drug offenses. Nearly one-third of participants had been arrested for a drug offense, and nearly two-fifths had been arrested for a person or property offense. Almost half of GPS and comparison group parolees had been arrested for “other” offenses, including weapons possession, resisting or obstructing a public officer, disorderly conduct, giving false identification, felony parole violations, DUI, obscene/threatening phone calls, disturbing the peace, and violating a restraining order. Study participants, then, were typically recidivists, who had prior records that included arrests for criminal acts other than sex offenses.

## **Parolee Supervision**

Parolees on both comparison and GPS caseloads were required to meet with their parole agents during supervision. Parole agents supervising HRSO and GPS caseloads were required to have two face-to-face contacts per month with parolees; four visits every quarter were to occur at the offender’s residence. Parole agents also monitored parolee progress by conducting home visits, telephone, and other collateral contacts. In addition, parolees were also monitored for drug use. [Table 3](#) presents the types of contact between parolee and parole agent for different contact types during the first six months of the follow-up period. The table provides information on both the percent of

**Table 2:** Detailed prior criminal record of participants' prior offenses.

Offense Category	Arrest Charges		Conviction Charges		Jail Sentence		Prison Sentence	
	Comparison %	GPS %	Comparison %	GPS %	Comparison %	GPS %	Comparison %	GPS %
No Priors	24.2	29.8	26.4	35.1	38.5	48.9	53.8	67.0*
Sex Offense								
Any sex offense	57.1	51.1	46.2	46.2	24.2	22.3	27.5	25.5
Rape	18.7	12.8	6.6	5.3	1.1	2.1	4.4	2.1
Child	29.7	29.7	22.0	28.7	6.6	9.6	14.3	17.0
Oral	13.2	8.5	7.7	4.3	0.0	0.0	6.6	4.3
Sodomy	8.8	4.3	2.2	0.0	0.0	0.0	1.1	0.0
Penetrate	7.7	10.6	2.2	0.0	1.1	0.0	1.1	0.0
Other sex	27.5	22.3	19.8	19.1	15.4	12.8	7.7	7.4
Reg 290	16.5	8.5	11.0	4.3	5.5	2.1	4.4	1.1
Persons	41.8	36.2	30.8	22.3	16.5	14.9	11.0	7.4
Property	54.9	33.0***	44.0	25.5***	34.1	20.2**	19.8	4.3***
Drug	34.1	28.7	22.0	17.0	6.6	10.6	14.3	4.3**
Other†	60.4	45.7*	37.4	24.5*	24.2	14.9	3.3	0.0

p-values for significance test based on Fisher's Exact Test.

Note: \* = comparison and GPS different, \* = p < 0.1; \*\* = p < .05; \*\*\* = p < .01.

† Other offenses include weapons possession, resisting or obstructing a public officer, disorderly conduct, giving false identification, felony parole violations, DUI, obscene/threatening phone calls, disturbing the peace, and violating a restraining order. None of these individual charges was statistically significant between groups.

**Table 3:** Intensity of agent contacts per month, contact type.

Contact Type	Comparison Parolees			GPS Parolees		
	%	Mean	Median	%	Mean	Median
Residence	98.7	1.40	1.30	97.8	1.60***	1.70
Jail	2.5	0.00	0.00	10.0*	0.00**	0.00
Employment	3.8	0.00	0.00	5.6	0.00	0.00
Office	97.5	1.40	1.30	98.9	2.10***	1.80
Telephone	51.9	0.60	0.20	75.6***	2.10***	0.60
Attempted	51.9	0.20	0.20	28.9***	0.10***	0.00
Collateral	98.7	2.70	2.70	97.8	4.60***	3.70
Drug testing	93.7	1.10	1.10	91.1	1.00	1.00
Case review	73.4	0.20	0.30	85.6*	0.30***	0.30
Other	41.8	0.20	0.00	90.0***	2.50***	1.35
Residence or office	98.7	2.80	2.80	98.9	3.80***	3.50
Face to face	98.7	2.80	2.80	98.9	3.80***	3.70

p-values for proportions from Fisher's Exact Test; means from the Wilcoxon rank-sum test.

Significance Levels: \* =  $p < .1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

Note: Residence or Office = Residential or office contact.

Face to face = Residence, jail, employment, or office.

each group who had each type of contact and the monthly rate of contacts for parolees in each group to provide a measure of intensity of supervision.<sup>12</sup> Relative to the comparison group, GPS parolees were significantly more likely to have telephone and other contacts, but less likely to have attempted contacts. In addition, the average number of contacts was generally higher for the GPS group relative to the comparison group. For example, the average number of face-to-face contacts per month for GPS parolees was 3.8 compared to an average of 2.8 for HRSO comparison parolees. The same differences between GPS and comparison parolee contacts existed with regard to residence and office visits (we consider contact levels later in our regression models).<sup>13</sup>

## Parolee Outcomes

This section presents recidivism outcomes for both the GPS and comparison groups. Multiple indicators of recidivism were used. In California at the time of the current study, parole could be violated for technical conditions of parole as well as for new criminal behavior. Both behaviors were handled by the Board of Parole Hearings (BPH) in a hearing process in which parolees are represented by counsel. Table 4 presents the percentage of each group who either accepted a plea to a violation or received a determination of a violation from the BPH, covering both technical conditions and new criminal behavior.<sup>14</sup> We use "guilty" as shorthand to describe this outcome. Comparison group offenders were more than three times more likely to be guilty of absconding (9.9% versus 2.1%) or failure to register their sex offender (290PC) status (13.2% versus 3.2%). Furthermore, as one might expect, GPS offenders were

**Table 4:** Sex offender parolees “guilty” of violations, 12-month follow-up.

Sex Offender Parolee Violations	Percent of Parolees Guilty of Violation and Group	
	Comparison	GPS
Any Violation	45.1	35.1
Any Technical Violation	37.4	31.9
VSC sex	9.9	5.3
VSC inform agent	11.0	6.4
VSC contact	2.2	1.1
VSC drugs alcohol	11.0	12.8
VSC abscond	9.9	2.1**
VSC association	1.1	2.1
VSC location	13.2	11.7
VSC GPS	0.0	7.4**
VSC instructions	7.7	3.2
VSC treatment	4.4	6.4
Any Criminal Violation	35.2	19.1**
Fail to register for 290 PC	13.2	3.2*
Drug crime	20.9	14.9
Sex crime	1.1	1.1
Assault crime	1.1	2.1
Nuisance crime	2.2	3.2
Other crime	4.4	3.2

p-values for the significance test are based on Fisher’s Exact Test.

Note: \* = comparison and GPS different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ . VSC = violation of special condition of parole.

more likely to be guilty of a GPS-related violation (7.4% versus 0.0%, for GPS and comparison parolees, respectively). Although both groups were equally likely to be guilty of a parole violation, comparison group parolees were significantly more likely to be violated for new criminal behavior compared to GPS offenders (35.2% versus 19.1% for comparison and GPS parolees, respectively). No other significant differences between groups were detected.

In order to control for potential differences in the background and other characteristics of the two groups, we conducted logistic regression analyses of violations for absconding and failure to register as a sex offender—two of the behaviors relevant to sex offender legislation. Our strategy was to introduce blocks of variables, starting with demographics, then adding in successive models, prior record, dynamic factors (such as living situation, employment), contact levels, and sex offender variables (e.g., Static-99). We then eliminated variables that were nonsignificant at  $p > .10$  to produce parsimonious models. Table 5 results are consistent with the univariate results presented above; however, for absconding, GPS parolees were marginally significantly different ( $p < .14$ ) from comparison parolees. Inclusion of contact intensity dampens the effect seen earlier in Table 4 for GPS, reflecting the shared variance of contact level and GPS (we note, however, that when cross-overs are dropped, the effect of GPS remains significant at the  $p < .10$  level; see Appendix A). GPS



**Table 5:** Logistic regression of absconding and registration violation within 12-month follow-up.

Factor	Absconding			Registration Violation		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
		LCL	UCL		LCL	UCL
GPS parolee	0.194	0.027	1.371	0.125**	0.024	0.659
Face-face contact intensity	0.427**	0.208	0.875	1.383*	0.979	1.955
Age imprisoned	0.889**	0.811	0.976	0.929**	0.872	0.991
First release	0.092**	0.009	0.949	0.380	0.092	1.565
Months since last release	0.884*	0.771	1.013	0.950	0.869	1.039

Note: \* = comparison and GPS groups different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

offenders were significantly less likely to be violated for failure to register their addresses as sex offenders than comparison parolees. Very few background and other variables were significant in predicting these two outcomes. The variables in the models are widely identified predictors of general recidivism—age, whether the parolee has been previously returned to custody on this term, and length of time since their last release. There are too few cases with these outcomes to accommodate more variables in the models once these general factors are accounted for. If at first it seems surprising that models in [Tables 5](#) include the same factors, it makes sense considering that both outcomes are similar—ways of avoiding supervision/surveillance.

The most severe punishment for parolee misconduct in the community is reincarceration. A parolee can be returned to prison by the BPH through the violation process (above), or can be returned to prison through the criminal courts as a result of a court conviction for a new offense. The percent of comparison and GPS parolees returned to prison either by the BPH or by a conviction in court for a new crime is displayed in [Table 6](#). During the 12-month follow-up period, there were no significant differences between the two groups in terms

**Table 6:** Parolees returned to prison within 12-month follow-up.

Group	Returned for (percent):		
	Parole Violation	New Court Conviction	Any Return
GPS	34.0	1.1	35.1
Comparison	35.2	2.2	37.4

p-values for significance test based on Fisher's Exact Test.

Note: \* = comparison and GPS different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

of the percent of parolees returned to prison. Parolees in both groups were most often reincarcerated by the BPH for violations. Few offenders were returned to prison by a court for a new offense.

Another difference in outcomes between groups is the higher rate of violations for a new criminal offense, with 35% of the comparison group receiving one or more such violations as opposed to 19% of the GPS group. Initially we modeled both new criminal offenses and returns to custody using the same procedures as for absconding and registration violations, arriving at models with slightly different sets of factors which might not include usually important factors such as age or theoretically relevant factors such as Static-99 scores. To achieve better clarity on factor contributions, we decided to develop models using a common set of variables, drawn from those with univariate significance at the 0.05 level for both outcomes. Again we entered factors in blocks and retained those that were significant at the 0.1 level in either model. The final models are in [Table 7](#).

Violations for new criminal offenses are driven mainly by persons whose incident offense is a drug or property crime. People with residential rather than institutional living arrangements, those with current employment, and GPS parolees are less likely to be violated for a new criminal offense. Our model for return to prison over the 12-month follow-up period, however, found no statistically significant differences between the comparison and GPS groups. Other factors were significant predictors of parole failure. For example, an increase in Static-99 risk score increased the odds of being returned to prison, as did having a current drug or property offense. Conversely, factors such as being employed, having a high school education, and a residential living situation decreased the odds of being returned to prison by 60–70%.

**Table 7:** Logistic regressions of a new criminal offense and return to prison within 12-month follow-up.

Factor	New Criminal Offense			Return to Prison		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
		LCL	UCL		LCL	UCL
GPS parolee	0.315*	0.129	0.774	0.721	0.318	1.636
Age imprisoned	0.973	0.935	1.012	0.969*	0.933	1.005
Static-99	1.144	0.940	1.392	1.293***	1.068	1.565
Incident property offense	4.506*	0.899	22.594	4.268*	0.818	22.273
Incident drug offense	9.973***	2.595	38.325	6.566***	1.781	24.203
Currently employed	0.254***	0.101	0.638	0.265***	0.112	0.630
High school education	0.488	0.199	1.197	0.378**	0.162	0.879
Residential living	0.288**	0.106	0.784	0.361**	0.148	0.878

Note: \* = comparison and GPS groups different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

## DISCUSSION AND CONCLUSIONS

This study represents the first test of GPS technology on supervision and outcomes for a specialized caseload of HRSO on parole in California. Our findings are nuanced. There were no significant differences with regard to the overall recidivism rates of the two groups in terms of violations in general and returns to custody. These findings coincide with previous research in which intermediate sanctions were found to have no effect on recidivism (Bonta, Rooney, & Wallace-Capretta, 1999; Gendreau & Goggin, 1996; MacKenzie, 2006; Petersilia & Turner, 1992).

However, our study did uncover differences when we examined different types of recidivism behaviors. GPS parolees were overall less likely to receive a violation for a new crime; however, failure to register as a sex offender was the only specific class of crimes that was statistically different for the two groups. The study found that there were no significant differences between comparison and GPS parolees with regard to *criminal* sex and assault violations, at least as measured by official parole records. This may be due, in part, to very low rates of violations for these offenses. Results showed that there were some differences between GPS and comparison parolees on *noncriminal* technical violations. Comparison group parolees were significantly more likely to be guilty of charges for failure to register as a sex offender, and marginally for absconding. Our findings in this respect are consistent with those of Gies et al. (2012) who compared California sex offenders on GPS with those on routine parole supervision. Those authors found that subjects in the GPS group had better outcomes in terms of sex-related violations and new arrests, although not significantly better in terms of overall proportions who received violations during a one-year follow-up. Reduced absconding and registration failures with the use of GPS is an important finding, in that the whereabouts of sex offenders is a critical component of effectively monitoring them in the community. We note that the success in reductions of registration and (marginally) abscond rates may reflect the managerial aspect of correctional supervision of the “new penology” discussed by Feeley and Simon (1992). Perhaps most important, our study findings on the use of GPS show reductions in behaviors of concern to corrections and to the public—knowing where offenders are and having them registered—but they may not necessarily affect actual change in underlying criminal behavior.

Our finding that comparison group parolees were more likely to be guilty of a parole violation for a criminal offense may indicate that GPS deterred criminal behavior among sex offenders who would have otherwise committed a new offense. Higher rates for the comparison group may also reflect the fact that the comparison group had more property offenders; however, when we controlled for background characteristics in regression models the difference between the GPS and comparison groups remains significant at the 0.1 level.

Furthermore, as Petersilia and Turner (1992) note, it is difficult to determine the extent to which the GPS units changed the *actual* behavior of parolees, since complete data on the behavior of parolees was not available.

We can place the recidivism rates found in our study findings in the context of what other researchers have found. Compared to previous studies in which arrest recidivism rates for sexual offenses were approximately 5.3% after three years (Langan et al., 2003), this study found higher rates of sexual recidivism over a shorter period of time (12 months) with regard to sex parole violations (9.9% and 5.3% for comparison and GPS parolees, respectively), and lower rates of sexual recidivism for offenses classified as new crimes (1.1% for both groups). The sexual recidivism rates found in this study are considerably less than those presented by Hanson's (1998) longer term follow-up with self-report data, but fairly consistent with sex violation rates reported by Gies et al. (2012), ranging from 5.0% to 12.4%. The total recidivism rate for parole violations in this study was consistent with previous research (Langan et al., 2003) (just under 45.1% for comparison and 35.1% for GPS), but considerably less when examining only new crimes (19.1% for GPS and 35.2% for comparison parolees, respectively).<sup>15</sup>

Overall GPS parolees were less likely to fail to register as a sex offender and marginally less likely to abscond compared to comparison group parolees. If the GPS units are affecting parolee behavior, then it may be deterring parolees from engaging in these types of behaviors. Parolees absconding from supervision do pose a significant problem in California. At the time of our study, of the more than 120,000 parolees released from prison, more than 38,000 absconded from supervision (California Department of Corrections and Rehabilitation, 2009). Hence, GPS may be beneficial with regard to reducing the likelihood that a parolee will abscond from supervision, particularly sex offenders, who tend to spark greater concern among the media and general public when their whereabouts are unknown.

Although GPS monitoring of sex offenders has demonstrated benefits, its implementation is costly. A recent cost-benefit analysis of GPS in California found that HRSO monitored by GPS cost an average of \$4,600 per year more than other HRSO supervised on intensive caseloads (Omori & Turner, 2012). The main reason behind this increased cost is the reduced parole agent case loads associated with monitoring GPS parolees. Although knowing the whereabouts of sex offenders is important, the cost of monitoring sex offenders on GPS may outweigh these benefits, given the fact that GPS sex offenders were no more likely to commit a new sexual offense compared to their comparison group counterparts.

We also note some limitations to the study. First, although the characteristics of the individuals in both the GPS and comparison groups were similar, group participation was not assigned randomly. Random assignment is a more effective way to assess whether recidivism is lowered by the use of GPS, as

differences in outcomes between the treatment group and the comparison group are more strongly linked to the program itself. We were, however, able to take advantage of imperfect implementation on the part of parole to establish comparable GPS and comparison groups. Another limitation of this study is the reliance on officially recorded data rather than self-reported recidivism behavior. Although GPS parolees had fewer parole violations, self-report behavior from both groups might provide more definitive results on how GPS impacted criminal and supervision behaviors. Third, our ability to determine recidivism and detect differences between groups may be limited by both the low base rate for sexual and violent crimes and the relatively short follow-up time. We note that although both GPS and comparison caseloads were smaller than the CDCR's routine parolee supervision caseloads of 70 offenders, they were not the same. GPS caseloads were approximately 20, while comparison were 40. It is not clear to what extent this difference may have affected study findings; however, regression models controlled for contact intensity (when significantly related to the outcome) to control for caseload size. Finally, although the sample size has sufficient statistical power to detect a moderate-sized effect (approximately 0.8 for a proportion difference of 20 percentage points, two-tailed test), a larger sample may have provided more robust results for smaller differences between groups. Our use of multiple p values for significance in tables reflects our sensitivity to the modest power of our sample size.

The use of GPS technology continues to expand. In California, GPS units have been assigned to newer "gang" units across the state in an effort to investigate its effectiveness in several areas, including recidivism and as an investigative and prosecutorial tool. Restrictions for sex offenders also continue to play out in legislatures across the country. In 2012, the National Conference of State Legislatures reported that at least 165 bills in 31 states had been introduced in state legislatures, focusing on key issue such as where sex offenders can vote; where they can live, work, and volunteer; along with which offenders are required to register as sex offenders. The use of technology combined with increasing restrictions on the overall movements and locations of sex offenders have become standard methods of supervision. This current study adds more empirical evidence on what GPS technology does and does not achieve when incorporated into the supervision of HRSO.

## NOTES

1. Under California's sex offender registration law, Penal Code 290, offenders are required to register for a variety of offenses, including sexual assaults, molestations, exposure crimes, kidnappings, and some statutory rapes.
2. Study participants assigned the highest-risk scores were young, had multiple prior sexual convictions, and targeted boys for molestation.

3. Law enforcement can establish inclusion and exclusion zones, further restricting the movements of offenders. An exclusion zone is a prohibited area, such as a school or playground, whereas an inclusion zone is an acceptable area, such as an employment site or treatment center (DeMichele & Payne, 2009; International Association of Chiefs of Police, 2008).
4. The recent evaluation by Gies et al. (2012) compared HRSO with GPS in California with routine parole supervision for HRSO in California. There are important differences between their study design and ours (time frame, geography, matching that eliminated some GPS parolees), the most important of which is the composition of the comparison group. Our study explicitly compares the differences between two intensive caseloads; the Gies et al. study compares GPS with routine supervision parole, with statistical controls for caseload size.
5. Numbers provided to authors by the Division of Adult Parole Operations.
6. HRSO were placed on specialized caseloads in San Diego; not all HRSO across the state were placed on these special caseloads at the time of our study.
7. The four GPS caseloads were managed by four agents; however, there was some turnover during the study period such that the same four agents were not managing the GPS caseloads throughout the pilot.
8. The Static-99 is a ten-item risk assessment instrument developed specifically to assess the risk level of sex offenders. See Harris, Phenix, Hanson, and Thornton (2003) and Hanson and Thornton (1999) for a description of the instrument and information regarding its validation.
9. A total of 14 additional parolees were placed onto GPS units during the study period.
10. Tracking units monitor the strap to make sure wearers don't attempt to remove the unit. The GPS application allows the supervising agent to define exclusion zones, areas the parolee is forbidden to enter, and puts out an alert if it is violated. Supervisors can also designate inclusion zones, such as a workplace or residence, and the hours when a parolee must be within the area.
11. Study staff were trained in scoring the Static-99 and calculated the scores when they were not included in the parolee file.
12. The monthly rate of contacts was computed as the total number of contacts for each parolee divided by the number of days during the six-month follow-up when he/she was either on GPS or comparison status.
13. Attempted contacts refer to unsuccessful agent-initiated contacts. Case reviews were periodic sessions to formally reevaluate a case, progress, or level of supervision, among other things. Residence or office indicates where the contact took place, whereas face-to-face contacts draw from any setting in which the parole agent and offender would have met in person, such as the offender's residence, the parole agent's office, parolee's place of employment, jail, or during a drug testing appointment. The other category consisted of a number of miscellaneous contacts, such as an agent visiting a parolee following a treatment session or any other meeting that might have taken place at an alternative location.
14. Analyses of filed violations, not reported here, showed the same pattern of between-group differences as the analysis of violations in [Table 4](#).
15. These differences may be partially explained by our shorter follow-up time of 12 months, but this is somewhat mitigated by the tendency of most recidivism to occur within 12 months of release.

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**APPENDIX A****INITIAL SEX OFFENDER RISK EVALUATION**

This evaluation is to be completed by a High Risk Sex Offender Caseload parole agent to assess the risk of a 290 PC registerable parolee to re-offend sexually. This evaluation is to be completed prior to the parolee's release to facilitate immediate placement on the appropriate caseload. An evaluation as a "High Risk Offender," indicates a need for placement on a High Risk Sex Offender caseload where available.

**PAROLEE NAME:** \_\_\_\_\_ **CDC NO:** \_\_\_\_\_

**LOW RISK OFFENDER**

Commitment offense is non-sexual

There may be additional sex offenses in the parolee's criminal record, which may be adjudicated and/or non-adjudicated.

Offending sexually is more opportunistic or situational than a primary deviant sexual orientation.

Comments:

**MODERATE RISK OFFENDER**

Commitment offense is sexual.

There may be additional sex offenses in the parolee's criminal record, which may be adjudicated and/or non-adjudicated.

Offending sexually is more opportunistic or situational than a primary deviant sexual orientation.

Comments:

**HIGH RISK OFFENDER**

Commitment offense is sexual or is related to an established pattern of deviant sexual behavior.

One victim over long period of time (multiple counts).

The parolee's criminal record may contain other sexual offenses and minimal or no history of non-sex offenses.

- The offense is deviant sexually oriented.
- The sex crime involved multiple victims or numerous crimes involving a single victim perpetrated over an extended time period.
- Same Sex Pedophilia.

**APPENDIX TABLES**

**Drop Cross-overs and Female, n = 173**

**Table A3:** Intensity of agent contacts per month, contact type.

Contact Type	Comparison Parolees			GPS Parolees		
	%	Mean	Median	%	Mean	Median
Residence	98.6	1.30	1.30	97.8	1.60***	1.70
Jail	2.9	0.00	0.00	9.0	0.00	0.00
Employment	2.9	0.00	0.00	5.6	0.00	0.00
Office	97.1	1.40	1.30	98.9	2.10***	1.80
Telephone	55.1	0.60	0.20	76.4***	2.10***	0.70
Attempted	55.1	0.30	0.20	29.2***	0.10***	0.00
Collateral	98.6	2.70	2.50	97.8	4.70***	3.70
Drug testing	95.7	1.10	1.00	91.0	1.00	1.00
Case review	71.0	0.20	0.20	85.4**	0.30***	0.30
Other	37.7	0.20	0.00	89.9***	2.60***	1.40
Residence or office	98.6	2.80	2.80	98.9	3.80***	3.50
Face-to-face	98.6	2.80	2.80	98.9	3.80***	3.70

p-values for proportions from Fisher’s Exact Test; means from the Wilcoxon rank-sum test.  
 Significance Levels: \* = p < .1; \*\* = p < .05; \*\*\* = p < .01.  
 ResOffice = Residential or office contact.  
 FaceToFace = Residence, jail, employment, or office.

**Table A4:** Sex offender parolees “guilty” of violations, 12-month follow-up.

Sex Offender Parolee Violations	Percent of Parolees Guilty of Violation and Group	
	Comparison	GPS
Any Violation	43.8	34.4
Any Technical Violation	36.3	31.2
VSC sex	8.8	5.4
VSC inform agent	11.3	5.4
VSC contact	2.5	1.1
VSC drugs alcohol	12.5	11.8
VSC abscond	10	2.2**
VSC association	1.3	2.2
VSC location	11.3	11.8
VSC GPS	0	7.5**
VSC instructions	6.3	2.2
VSC treatment	3.8	5.4
Any Criminal Violation	32.5	19.4*
Fail to register for 290 PC	11.3	3.2*
Drug crime	18.8	15.1

(Continued)

**Table A4:** (Continued).

Sex Offender Parolee Violations Violation Type	Percent of Parolees Guilty of Violation and Group	
	Comparison	GPS
Sex crime	0	1.1
Assault crime	1.3	2.2
Nuisance crime	2.5	3.2
Other crime	5	3.2

p-values for the significance test are based on Fisher's Exact Test.

Note: \* = comparison and GPS different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ . VSC = violation of special condition of parole.

**Table A5:** Logistic regression of absconding and registration violation within 12-month follow-up.

Factor	Absconding			Registration Violation		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
		LCL	UCL		LCL	UCL
GPS parolee	0.187*	0.027	1.300	0.123**	0.022	0.680
Face-face contact intensity	0.437**	0.213	0.896	1.391*	0.977	1.981
Age imprisoned	0.897**	0.817	0.984	0.929**	0.867	0.996
First release	0.093**	0.009	0.962	0.249*	0.049	1.280
Months since last release	0.881*	0.767	1.011	0.949	0.862	1.045

Note: \* = comparison and GPS groups different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

**Table A6:** Parolees returned to prison within 12-month follow-up.

Group	Returned for (percent):		
	Parole Violation	New Court Conviction	Any Return
GPS	33.3	1.1	34.4
Comparison	33.8	2.5	36.3

p-values for significance test based on Fisher's Exact Test.

Note: \* = comparison and GPS different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .

**Table A7:** Logistic regressions of a new criminal offense and return to prison within 12-month follow-up.

Factor	New Criminal Offense			Return to Prison		
	Odds Ratio	95% Confidence Interval		Odds Ratio	95% Confidence Interval	
		LCL	UCL		LCL	UCL
GPS parolee	0.341**	0.128	0.909	0.684	0.286	1.633
Age imprisoned	0.953**	0.910	0.998	0.959**	0.921	0.999
Static-99	1.196	0.960	1.488	1.354***	1.102	1.664
Incident property offense	3.712	0.616	22.367	3.414	0.578	20.152
Incident drug offense	16.945***	3.641	78.862	8.186***	1.942	34.504
Currently employed	0.205***	0.075	0.561	0.269***	0.108	0.669
High school education	0.496	0.188	1.312	0.383**	0.158	0.930
Residential living	0.220***	0.071	0.683	0.362**	0.142	0.925

Note: \* = comparison and GPS groups different, \* =  $p < 0.1$ ; \*\* =  $p < .05$ ; \*\*\* =  $p < .01$ .