

RESIDENTIAL PROXIMITY TO SCHOOLS AND DAYCARES

An Empirical Analysis of Sex Offense Recidivism

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Residential restrictions for sex offenders have become increasingly popular, despite the lack of empirical data suggesting that offenders' proximity to schools or daycares contributes to recidivism. Using a matched sample of recidivists and nonrecidivists from Florida ($n = 330$) for the period from 2004 through 2006, the authors investigated whether sex offenders who lived closer to schools or daycares were more likely to reoffend sexually against children than those who lived farther away. No significant differences were found between the distances that recidivists and nonrecidivists lived from schools and daycares. There was no significant relationship between reoffending and proximity to schools or daycares. The results indicate that proximity to schools and daycares, with other risk factors being comparable, does not appear to contribute to sexual recidivism. These data do not support the widespread enactment of residential restrictions for sexual offenders.

Keywords: residence restrictions; sex offenders; housing; recidivism; geocoding

Laws restricting where convicted sex offenders live have become increasingly common. These policies are intended to reduce the risk posed to children by repeat sexual offenders. At least 30 states and hundreds of municipalities across the United States have enacted laws requiring registered sex offenders (RSOs) to reside at some minimum distance from schools, parks, daycares, school bus stops, or other places commonly visited by children (Meloy, Miller, & Curtis, 2008). These laws generally target abusers of minor children, but many jurisdictions apply housing restrictions to all RSOs. Typical residence restrictions prohibit RSOs from living within 500 to 2,500 ft of certain locations. Although repetitive predatory sexual violence is a grave concern for legislators and their constituents, no consensus exists about the strategies most effective in preventing sex crime recidivism. Few empirical studies have been conducted to ascertain the role of residential restriction laws in protecting children from sexual abuse. The purpose of this study is to examine the relationship between sex offense recidivism and residential proximity to common places where children congregate.

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Little is known about the ways in which the residential locations of sex offenders might influence sex offense recidivism. Routine activities theory (RAT) (Cohen & Felson, 1979) postulates that for crime to occur, three conditions must exist: the presence of a motivated offender, access to a potential victim, and the absence of capable guardians to prevent criminal activity. As applied to sex offender residence restrictions, RAT would suggest that predatory or pedophilic sex offenders are most likely to commit new assaults against children when they have unrestricted or unmonitored access to youngsters. Living in close proximity to a school or other place known to cater to children might, theoretically, increase opportunities for sex offenders to have contact with children or to view children playing, thereby reinforcing their sexually deviant preferences and facilitating child sexual abuse.

The impact of residence restrictions laws on recidivism remains largely unknown. The only known investigation to date was conducted by the Iowa Department of Criminal and Juvenile Justice Planning (Blood, Watson, & Stageberg, 2008). Iowa's statewide 2,000-ft residential restriction law went into effect in August 2005. Researchers compared the number of charges filed for sex offenses with minor victims in the 12 months prior to the enforcement of the law with the number of charges filed within 24 months after implementation. The number of charges steadily increased each year; there were 913 charges filed during the year prior to implementation, 928 filed the subsequent year, and 1,095 filed the following year. The authors concluded that Iowa's residence law "does not seem to have led to fewer charges or convictions, indicating that there probably have not been fewer child victims" (Blood et al., 2008, p. 10).

Mapping technologies provide other opportunities for researchers to study key questions related to proximity and recidivism. In keeping with RAT, one might surmise that pedophiles choose to live within easy access to children and that those living in closer proximity to schools, parks, or bus stops would have higher recidivism rates than offenders living farther away. The empirical data surrounding these assumptions are extremely limited and decidedly mixed.

An analysis of the addresses of RSOs in Pulaski County, Arkansas, found that child abusers were more likely than other sex offenders to live near schools, daycares, and parks (Walker, Golden, & VanHouten, 2001). In Newark, New Jersey, however, those who abused children lived significantly farther from schools than did those who offended against adults (Chajewski & Mercado, 2008). However, the Newark sex offenders lived significantly closer (on average 1,094 ft closer) to schools than did other community members (Chajewski & Mercado, 2008); in Camden County, New Jersey, 88% of sex offenders lived within 2,500 ft of schools, parks, daycares, or churches, compared to 80% of households in general (Zgoba, Levenson, & McKee, 2009).

RAT might suggest that sex offenders intentionally place themselves in close proximity to potential victims, but an alternative explanation is that economic considerations are the primary factors influencing residential choices (Red Bird, 2009; Tewksbury & Mustaine, 2006; Tewksbury & Mustaine, in press-a). Underemployment is not unusual for those with a felony conviction, and as a result, sex offenders often reside in less affluent communities (Tewksbury & Mustaine, 2006). RSOs are likely to be found in disadvantaged neighborhoods with higher levels of social disorganization (Red Bird, 2009; Tewksbury & Mustaine, 2008). Lower income neighborhoods tend to exist in densely populated urban areas where, consequently, residential dwellings are in closer proximity to schools and other child-oriented sites. Such neighborhoods might be more affordable for criminal offenders, but they are

also characterized by community neglect and a paucity of resources that make their residents more vulnerable to crime. It is interesting to note that although sex offenses occur more frequently in census tracts with larger proportions of young children, the number of schools is not associated with a greater frequency of sex offenses (Tewksbury, Mustaine, & Stengel, 2008). Moreover, Tewksbury et al. (2008) found that a higher concentration of RSOs in a neighborhood was not significantly correlated with the incidence of sex offenses.

Thus far, proximity to schools has not been studied in such a way that can explicitly determine its empirical relationship to sex offense recidivism. In Colorado, sex offenders' residential proximity to schools and daycares was not specifically analyzed, but mapping allowed the authors to infer that sex offense recidivists resided randomly throughout the geographical area and did not appear to live closer to schools and daycares than nonrecidivists (Colorado Department of Public Safety, 2004). A qualitative analysis of 13 recidivistic sex offenses in Minnesota revealed that only 2 reoffenses took place in parks and none occurred near schools. In both cases, the perpetrators did not live in close proximity to the crime scene and in fact drove a vehicle to commit the offense (Minnesota Department of Corrections, 2003). More recently, researchers in Minnesota analyzed 224 recidivistic sex offenses and concluded that none would have been prevented by a residence restriction law (Duwe, Donnay, & Tewksbury, 2008). The authors did not measure where the offenders lived in relation to places where children congregate, but by using police reports and case files, they were able to determine whether an offender first established contact with a minor victim in or near a location typically restricted by housing laws. Using Google Earth, they calculated the straight-line distance between the offender's home and the locations of the offense and first victim contact. Most offenders first made contact with victims more than 1 mile from their homes. Predatory assaults that occurred within a mile of the offenders' residences were most likely to be perpetrated against adult victims; of those involving minor victims, most contact was cultivated within 2,500 ft of the offenders' homes, but none was facilitated by close proximity to a school, daycare, or park. The sex offenses against children were most likely to be perpetrated by offenders who were well acquainted with their victims, such as parents, caretakers, paramours of the mothers, babysitters, or friends of the family. Only in 3.6% of the cases was the sex offender a neighbor of the victim. The authors concluded that in child sexual abuse cases, social or relationship proximity to victims is a more important factor than residential proximity (Duwe et al., 2008).

Although the empirical link between residential proximity and sexual recidivism has yet to be established, emerging evidence indicates that housing availability is greatly diminished by residence restriction policies. In Orange County, Florida, the locations of more than 137,000 residential parcels were analyzed, and 95% were found to be located within 1,000 ft of schools, parks, daycares, or school bus stops (Zandbergen & Hart, 2006). A buffer zone of 2,500 ft resulted in excluding more than 99% of all residential parcels and eliminated all but 37 properties in the entire county (Zandbergen & Hart, 2006). Similarly, in New Jersey, 93% of Newark's residential territory is located within 2,500 ft of schools, and therefore few addresses would be compliant with a housing restriction of that distance (Chajewski & Mercado, 2008). In four major metropolitan centers in South Carolina, only 9% of the 540,613 properties zoned for residential use were unoccupied or available for rent, and of those, 45% would not be compliant with a 1,000-ft zone around schools or daycares (Barnes, Dukes, Tewksbury, & DeTroye, 2009). Researchers in Colorado concluded that in urban areas, the large number of schools and childcare centers located within residential

neighborhoods severely limited the areas in which sex offenders could reside if housing restrictions were implemented (Colorado Department of Public Safety, 2004).

Residential restrictions can also create obstacles to offender reintegration. Several studies indicate that homelessness and transience have become more problematic for RSOs. In a survey of RSOs in Oklahoma and Kansas, 54% reported that a housing restriction law forced them to relocate (Tewksbury & Mustaine, in press-b). In Indiana, 26% of sex offenders surveyed said that they were unable to return to their homes after incarceration, 37% were not allowed to live with family members, and nearly a third experienced a landlord's refusal to rent to them or to renew a lease (Levenson & Hern, 2007). Many sex offenders in Florida and Indiana reported that affordable housing is less available due to limits on where they can live and that they are made to live farther away from employment, public transportation, social services, and mental health clinics (Levenson, 2008; Levenson & Cotter, 2005; Levenson & Hern, 2007). Similarly, New Jersey sex offenders indicated that residential restrictions have led to financial hardship and pushed them farther away from employment, treatment, and family support (Mercado, Alvarez, & Levenson, 2008). Escalating problems of homelessness and transience were noted in Broward County, Florida, where 39% of the participants reported spending at least 2 days homeless or living with someone else and 22% said that they were forced to relocate more than twice (Levenson, 2008). Larger buffer zones were correlated with increased transience and homelessness and reduced employment opportunities (Levenson, 2008). Young adults seemed to be especially affected by these laws; age was significantly inversely associated with being unable to live with family and having difficulties securing affordable housing (Levenson, 2008; Levenson & Hern, 2007).

Ironically, housing instability is consistently and strongly correlated with increased criminal recidivism and absconding. In a sample of more than 6,000 criminal offenders in Georgia, each time a parolee relocated, the risk of being rearrested increased by 25%, doubling the odds of recidivism by moving three times while on parole (Meredith, Speir, & Johnson, 2007). Residential instability was determined to be the most robust predictor of absconding in a study of more than 4,000 parolees in California (Williams, McShane, & Dolny, 2000), and in a national sample of probationers ($N = 2,030$), those who moved multiple times during their period of supervision were almost twice as likely as stable probationers to have a disciplinary hearing (Schulenberg, 2007). In a New Zealand study of sex offenders, poor housing accommodation was the aspect of reintegration most strongly linked with sexual recidivism (Willis & Grace, 2008). A subsequent validation study confirmed that poor reintegration planning characterized by unstable housing, unemployment, and a lack of social support predicted recidivism in a sample of 141 sex offenders from New Zealand (Willis & Grace, 2009).

Currently, there are more questions than answers regarding the efficacy of residential restriction laws in deterring repetitive sexual predation. Although these policies are assumed to be a commonsense approach to reducing sex offenders' access to children, their underlying assumption—that keeping sex offenders far from schools and other child-friendly locations will protect children from sexual abuse—has yet to be empirically confirmed. There is no doubt that children deserve to be safeguarded from sexual predators. Clarifying the relationship between recidivism and proximity to venues such as schools will assist lawmakers in their quest to ascertain which strategies are best able to achieve that goal.

PURPOSE OF THE STUDY

The purpose of this study is to investigate the relationship between sex offense recidivism and residential proximity to places where children commonly congregate. Specifically, we sought to determine whether sex offenders who lived closer to schools or daycares were more likely to reoffend sexually than those who lived farther away. The null hypothesis proposes that there will be no significant differences between recidivists and nonrecidivists in their proximity to schools or daycares. In addition, the null hypothesis assumes no statistically significant correlation between proximity and recidivism. This research is important for identifying the role that residential distance from child-oriented venues might play in inhibiting sexual recidivism. Policies informed by scientific data are more likely to successfully accomplish their goals of community protection.

METHOD

Florida was considered to be an informative state in which to conduct this research. Florida was the first state to enact a residence restriction for RSOs (Meloy et al., 2008). As of 1995, sex offenders on probation in Florida have been prohibited from living within 1,000 ft of schools, parks, playgrounds, daycares, or other places where children congregate (Special Conditions of Sex Offender Probation, 1997). In 2005, school bus stops were added for offenders leaving prison under conditional release programs. In 2005, the nation's first municipal ordinance was passed in Miami Beach, restricting RSOs with minor victims from residing within 2,500 ft of schools, daycares, parks, and bus stops. Currently, according to the state's Department of Corrections, Florida has more than 150 local ordinances (typically 2,500-ft zones passed by county and city commissioners) in addition to a statewide 1,000-ft law that now applies to all RSOs.

The general approach used in this study to examine the effect of residential proximity on recidivism consisted of (a) determining the recidivist population for the period from 2004 to 2006, (b) selecting a comparable set of nonrecidivists, (c) geocoding the residential addresses of the two groups as well as all the schools and licensed daycares, (d) calculating proximity metrics for both populations, and (e) analyzing any differences in the distributions of proximity metrics between the two groups. These steps will be described in more detail in the sections below.

OFFENDER POPULATION

Data files on RSOs were obtained from the Florida Department of Law Enforcement (FDLE). The data included demographic information about each offender, a history of offenses, and a history of registered addresses. The database was obtained in 2007 and was considered up to date until December 2006. The publicly available registry of sex offenders for December 2006 was also obtained and matched to the FDLE records to obtain additional information not available in the original FDLE files. The original FDLE files contained information about 17,678 offenders, whereas the registry contained information about 38,084 offenders. This large discrepancy results from the fact that the registry is a cumulative record of all historical entries and contains numerous offenders who are deceased, have been deported, are under INS custody, or have established residency outside of Florida.

For the purpose of this study, a recidivist was defined as an RSO who had at least one conviction for a sex offense and who was arrested for a new sex offense in the period between January 1, 2004, and December 31, 2006. FDLE prepared the data with recidivists flagged based on this definition, including only those cases in which the original victim or the recidivistic victim was a minor (or both were minors). New arrests were used for our analysis because convictions can take a long time to take place and would create a temporal mismatch. Minor offenses, such as parole violations, were not considered recidivistic, and only sex offenses were counted as recidivistic.

For each recidivist, the following variables were determined: age at time of new arrest (based on date of birth and arrest date), sex, race, marital status, number of all offenses prior to arrest date, number of all sex offenses prior to arrest date, victim's age categories associated with both the original and the recidivistic offense, predator/offender status, and residential address prior to arrest date. The information about the victims' ages in the databases of offenses and new arrests was incomplete, and no exact ages could be determined. As a result, victim's age for both the original and the recidivistic offense was coded only as "minor" or "adult." For new arrests, the victim's age information was often missing, and therefore the victim's age category was based on the offense codes at the time of the arrest. Information about the actual age of the victim, the victim's gender, and the relationship to the victim was not available in the FDLE files. The residential address history was used to obtain the last address prior to the arrest date based on the date ranges for each address.

Initially, FDLE flagged a total of 237 recidivists. Processing the data resulted in a final set of 168 recidivists, with 69 records removed for various reasons: 1 record was excluded because the offender was female; 36 records were excluded because the recidivist had no priors for sex offenses; 14 records were excluded because the address prior to the offense was outside of Florida (in most cases, this meant the only address in Florida consisted of a jail); 18 records were excluded because of other address issues—typically, the address history could not be matched reliably to the offense date (e.g., due to incomplete addresses, incomplete dates, lack of logic in address sequence, presence of only jail addresses, etc.). Geocoding of the residential address prior to the offense (described in a later section) caused 3 more records to be removed due to incomplete geocoding, bringing the final set of recidivists to 165.

The sample of 165 recidivists contained 147 cases (or 89.1%) wherein the prior conviction was for a sex offense against a minor and the new arrest was for a sex offense against a minor. In 5 cases, the prior conviction was for a sex offense against an adult, and either the new arrest was for a sex offense against a minor or the victim's age category could not be determined. In 13 cases, the prior conviction was for a sex offense against a minor, and the victim's age category for the new arrest could not be determined.

The data about all offenders in the FDLE files ($N = 17,678$) were utilized to generate a meaningful sample of nonrecidivists. The offender data were cleaned to obtain only male nonrecidivists who resided at a valid nonjail address and for whom demographic and prior offense data were available. Processing included the following specific steps: (a) removing the sample of 237 recidivists; (b) removing all female offenders; (c) removing all offenders whose status was deceased, incarcerated, under INS custody, deported, or absconded; (d) removing all offenders whose address in December 2006 corresponded to the address of a correctional facility (in many cases, an offender is reported as released or under supervision, but if he or she fails to report a new address, the last known address is still the location of

TABLE 1: Variables Used to Characterize Offenders

Variable	Category	Code	Recidivists		Matched Nonrecidivists		Total Nonrecidivists
			n	%	n	%	n
Total			165	100.0	165	100.0	8,434
Predator/offender status	Predator	P	37	22.4	40	24.2	1,007
	Offender	O	120	72.7	125	75.8	7,427
	Unknown	U	8	4.8	0	0.0	0
Sex priors (convictions)	1	1	36	21.8	34	20.6	3,116
	2 or 3	2	75	45.5	75	45.5	3,525
	4 or more	3	54	32.7	56	33.9	1,793
Total priors (convictions)	3 or less	3	64	38.8	62	37.6	5,035
	4 or more	4	101	61.2	103	62.4	3,399
Racial composition	White	W	104	63.0	103	62.4	6,252
	Non-White	N	61	37.0	62	37.6	2,182
Victim age (initial) ^a	Minor	M	160	97.0	157	95.2	6,605
	Adult	A	5	3.0	3	1.8	523
	Unknown	U	0	0.0	5	3.0	1,306
Victim age (current) ^a	Minor	—	150	90.9	—	—	—
	Adult	—	0	0.0	—	—	—
	Unknown	—	15	9.1	—	—	—
Marital status	Other	O	25	15.2	22	13.3	988
	Single	S	77	46.7	82	49.7	3,118
	Married	M	29	17.6	29	17.6	2,335
	Divorced/separated/ widowed	D	34	20.6	32	19.4	1,993
Age	Younger than 25	1	57	34.5	55	33.3	462
	25 to 40	2	70	42.4	72	43.6	3,090
	41 to 60	3	31	18.8	31	18.8	3,673
	Older than 60	4	7	4.2	7	4.2	1,209

Note. Dashes indicate the variable is not applicable.

a. For both recidivists and nonrecidivists, the Victim Age (Initial) variable refers to the age of the victim associated with the original offense, whereas the Victim Age (Current) variable refers to the age of the victim associated with the recidivistic offense. Therefore, this variable is not applicable to the nonrecidivist group and was not used in the matching procedure.

the correctional facility); (e) removing all offenders with invalid addresses (missing street number, missing zip code and city, address outside of Florida); and (f) removing all offenders without complete demographic and prior offense data. This process resulted in a total of 8,434 nonrecidivists.

For each nonrecidivist, the following variables were determined for December 2006: age, race, marital status, number of prior offenses, number of prior sex offenses, victim's age category, predator/offender status, and residential address.

Next, a sampling strategy was devised to create a comparable sample of nonrecidivists based on age, race, marital status, number of prior offenses, number of prior sex offenses, and victim's age. For recidivists, the age of the victim associated with the prior sex offense was used. The logic behind this strategy is that such a sample controls for potential risk factors and other demographic variables, allowing for a direct comparison of proximity metrics. To facilitate the matching process, each of the seven variables was recoded according to Table 1.

The coding in Table 1 was used to create a seven-character code for each recidivist and nonrecidivist. Stratified random sampling using this code was employed to generate a sample of nonrecidivists equal in size ($n = 165$). In other words, if there were 3 recidivists who were predators who had two or three sex priors, had four or more total priors, were White, victimized minors, were single, and were between 25 and 40, a total of 3 nonrecidivists were selected at random from the total population of nonrecidivists with those exact same characteristics. This process was repeated to get a comparable sample of 165 nonrecidivists.

SCHOOLS AND DAYCARES

A database of all public and private schools for all of Florida was obtained from the National Center for Education Statistics for the 2005-2006 school year. All grades up to and including Grade 12 were included. The database included fields for the physical address of the school and consisted of 3,713 records for public schools and 1,818 records for private schools.

A database of all licensed daycares for Florida was obtained from the Florida Department of Children and Families for 2006. The database included both childcare facilities and home-based family daycares. The database included fields for the physical addresses of the daycares and consisted of 13,564 records.

The database of daycares contained records with missing address information, and both databases contained records with post office boxes for the street address. Secondary information from individual school boards and counties was therefore employed to supplement the address information. Although complete address information was obtained for every public school, a substantial number of incomplete records remained for private schools ($n = 72$) and daycares ($n = 4,276$). In the case of daycares, the incomplete address information was primarily the results of blank address fields for home-based daycares due to privacy concerns.

GEOCODING

The addresses for recidivists, nonrecidivists, schools, and daycares were geocoded using a multistage geocoding process. The most accurate way to represent the locations of these addresses within the context of this study is through the use of parcel boundaries. Although street geocoding is the most common method used in the United States to determine the location of addresses, this technique introduces positional error (Zandbergen, 2009), which can lead to substantial misclassification in determining proximity in the context of sex offender residence restrictions (Zandbergen & Hart, 2009). Parcel data, however, are not always available for all areas, and geocoding to parcels is also known for its relatively poor match rates, even when good parcel data are available (Zandbergen, 2008). The multistage geocoding process employed in the study was designed to overcome these limitations and to achieve the highest possible match rate at the parcel level. The geocoding process consisted of a combination of in-house geocoding using available address point, parcel, and street centerline data from local counties and third-party parcel and street geocoding by a commercial firm.

For the in-house geocoding, the Geographic Information System and property appraiser departments of all 67 Florida counties were contacted with a request for address point, parcel, and street centerline data. Address point data consist of address locations in point

format (i.e., a single XY location), typically associated with the Master Address File for a local jurisdiction such as a county. They are the preferred reference data for geocoding because their positional accuracy is excellent (the point is often placed directly on top of the building) and the match rates are very similar to those for street geocoding (Zandbergen, 2008). Parcel geocoding often results in lower match rates due in part to the fact that many addresses can be associated with a single parcel, such as a multiunit property. In the case of address points, these individual addresses are typically captured as individual points, resulting in multiple address points for a single parcel. The primary limitation of address points is their availability because only a selected number of local jurisdictions have developed an address point database. Address point data were obtained for 16 counties, including several of the most populated counties in the state such as Miami-Dade County and Orange County. Parcel data were obtained for all 67 counties, but the address information contained in the parcel data were considered of sufficient quality for geocoding for only 30 counties. Reliable street centerline data were obtained for 23 counties.

In-house geocoding using the available reference data was accomplished in ArcGIS 9.2. All reference data were projected to a common Florida Albers coordinate system. Individual address locators were built for every available data set. Geocoding settings included the use of a minimum match score of 80, which effectively means that minor misspellings in the street name are allowed but that the street number has to be a perfect match. Each of the three data sets (offenders, schools, and daycares) was run through the same geocoding sequence. First, addresses were run through the address point geocoding. Any nonmatching records after this first step were run through the parcel geocoding. Any nonmatching records after this second step were run through the street geocoding. This resulted in three sets of points: those from address points (the exact XY location of the building associated with the address), those from parcel polygons (the centroid of the polygons), and those from street segments (the interpolated location along the street segment).

Any of the records that did not produce a match using the in-house geocoding were submitted to a commercial firm specializing in parcel geocoding for Florida. This company essentially uses the same information as requested from each individual county but has gone through considerably more effort to acquire the data through licensing agreements. The company reported having complete address point and/or parcel data available for 62 counties and partial data for an additional 3 counties. Counties for which the coverage is lacking or incomplete are some of the least populated areas in Florida, which means that geocoding coverage at the parcel level based on population is greater than 99%. In addition to parcel-level geocoding, the commercial firm employs a secondary street geocoding technique based on local street centerlines. This second phase of the geocoding process resulted in two sets of points: those from parcel polygons (the centroid of the polygons) and those from street segments (the interpolated location along the segment).

Table 2 reports the geocoding match rates based on all valid addresses (i.e., after removing all blank address and post office boxes). Results for in-house address points, in-house parcels, and third-party parcels are grouped together as "parcel geocoded" because the locations can be associated with a specific parcel boundary. Results for in-house streets and third-party streets are grouped together as "street geocoded" because these represent interpolated locations along a street segment and cannot be associated with a specific parcel boundary.

Table 2 indicates that in-house address points resulted in the largest number of matches in all three databases, followed by in-house parcels. This reflects the fact that address

TABLE 2: Geocoding Match Rates

	<i>Offenders (n = 336)</i>	<i>Schools (n = 5,419)</i>	<i>Daycares (n = 9,288)</i>
Parcel geocoded			
In-house address points	123	1,831	3,301
In-house parcels	90	1,297	2,493
Third-party parcels	85	969	1,822
Subtotal	298	4,097	7,616
Street geocoded			
In-house streets	16	588	922
Third-party streets	16	616	554
Subtotal	32	1,204	1,476
Total	330	5,301	9,092
Parcel match rate (%)	88.7	75.6	82.0
Street match rate (%)	9.5	22.2	15.9
Total match rate (%)	98.2	97.8	97.9

points and/or parcel data were available for many of the most populated counties. The multistage geocoding proved successful in achieving high parcel-level match rates ($\approx 80\%$) and very high overall match rates ($\approx 98\%$). In the case of offenders, only 6 records could not be geocoded (3 recidivists and 3 nonrecidivists), resulting in a final sample of 165 in each category for further analysis.

Prior to further analysis, all parcel-geocoded locations as identified in Table 2 were spatially matched to the actual property boundary with which they are associated. This resulted in a set of polygons for all parcel-geocoded locations and a set of points for all street-geocoded locations for use in the proximity analysis.

PROXIMITY METRICS

The location of each recidivist and nonrecidivist was compared to the locations of schools and daycares. Specifically, the following proximity metrics were determined: distance to nearest daycare (in feet), distance to nearest school (in feet), number of daycares within a 1,000-ft buffer, number of daycares within a 2,500-ft buffer, number of schools within a 1,000-ft buffer, and number of schools within a 2,500-ft buffer. Figure 1 illustrates this methodology and includes the residential location of a single offender as well as the locations of one school and one daycare. The lines represent the shortest straight-line distance between the residence of the offender and the property boundaries of the school and daycare. The 1,000- and 2,500-ft buffers around the offender are also shown. In the example shown in Figure 1, the daycare location falls within the 1,000- and 2,500-ft buffers, and the school falls inside the 2,500-ft buffer but outside the 1,000-ft buffer.

The two distance values of 1,000 and 2,500 ft were chosen because Florida statutes currently employ a 1,000-ft buffer for residence restrictions and most of the local ordinances employ a 2,500-ft buffer. In determining these proximity measures, euclidean (or straight-line) distance was used. In the case of polygons, the shortest distance to any of the points along the boundary of the polygon was considered. These interpretations are consistent with the wording of the residence restrictions in Florida statutes and many local ordinances.

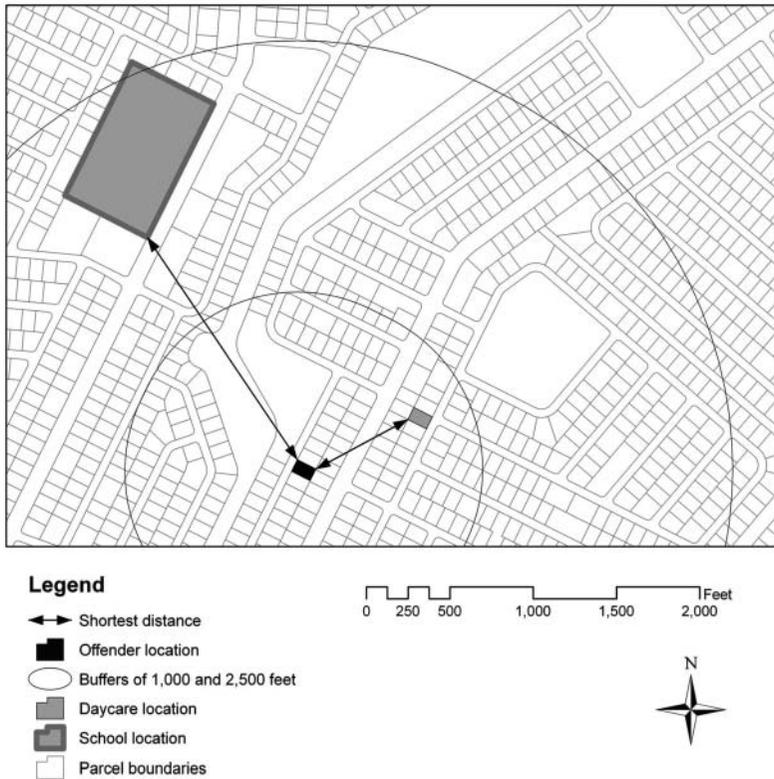


Figure 1: Illustration of the Methodology to Obtain Proximity Metrics

Note. 1,000- and 2,500-ft buffers are created around each offender's residence. Within each buffer polygon, a count was produced of the number of schools and daycare locations. A school or daycare is determined as residing within a particular buffer if any part of the parcel boundary falls inside the buffer polygon. Identical results would be produced if buffers were created around schools and daycares and the number of buffers overlapping each offender location were counted.

STATISTICAL ANALYSES

The distributions of the number of schools and daycares within distance buffers were summarized in tabular form and compared using a chi-square test. The distances to the nearest daycare and school were graphically summarized as cumulative distribution functions. Differences between the distributions were tested using chi-square and parametric and nonparametric tests of means. The predictive power of distance, controlling for certain risk factors, was assessed through a linear regression model.

RESULTS

Descriptive statistics of the offender population are displayed in Table 3. It is important to remember that this sample was generated by identifying recidivists and then creating a matched sample of nonrecidivists. The sample is therefore not representative of the sex

TABLE 3: Descriptive Statistics ($n = 330$)

	%	Mean	Median	Mode	Standard Deviation
White	63				
Minority	37				
Currently married	18				
Divorced/separated/widowed	34				
Never married	48				
Priors (all)		5.45	4.00	4	4.18
Priors (sex)		3.35	2.50	2	2.78
Offender	74				
Predator	23				
Minor victim ^a	96				
Offender age		33.1	30.0	24	12.8
Feet to daycare		5,182	1,780		9,116
Within 1,000 of daycare	23				
Within 1,500 of daycare	42				
Within 2,500 of daycare	61				
Feet to school		4,962	2,442		7,740
Within 1,000 of school	13				
Within 1,500 of school	26				
Within 2,500 of school	51				
Recidivist	50				

a. For recidivists, the victim age category is based on prior victim(s) only, not the new arrests.

offender population in Florida, and it consists of a more high-risk group than a randomly selected sample would be. The sample ($n = 330$) had accrued an average of 5.5 prior arrests for any crime (mode = 4) and 3 prior sex crime arrests (mode = 2). They were predominantly White and unmarried, and one quarter were designated as predators. Almost all (96%) had at least one minor victim in their criminal sexual history. The sample lived an average of 5,182 ft from a daycare and 4,962 ft from a school. More than half lived within 2,500 ft of a school or daycare.

Figure 2 shows the distribution of the recidivists ($n = 165$) and nonrecidivists ($n = 165$) within Florida. Although many offenders are located in large metropolitan areas (e.g., Miami, Tampa, Orlando, Jacksonville), a substantial number are located in smaller communities and rural areas. Some of the least populated counties in Florida, however, had no offenders. The general pattern that emerges from Figure 2 is that both recidivists and nonrecidivists are located throughout the state and not concentrated in a single area.

FACILITY COUNTS WITHIN BUFFER DISTANCES

Counts of the number of daycares and schools within 1,000-ft and 2,500-ft buffers around offenders are summarized in Table 4. Manual inspection of the distributions suggests very small differences. For example, when considering a buffer of 1,000 ft around offenders, 115 out of 165 recidivists have no daycare within this buffer, and 28 have one daycare, whereas 116 out of 165 nonrecidivists have no daycare and 31 have one daycare. Logically, a larger buffer of 2,500 ft results in more offenders having one or more daycares within this buffer, but the differences between the two populations remain small.

Differences between the distributions were tested using chi-square. A total of four tests were carried out, each comparing recidivists and nonrecidivists for one type of facility for

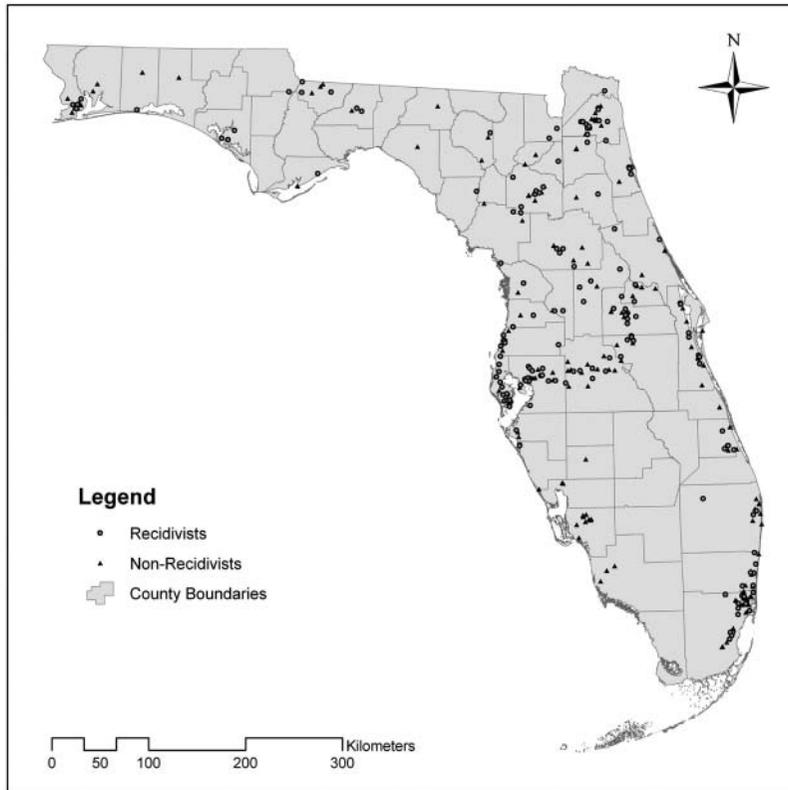


Figure 2: Residential Locations of Recidivists and Nonrecidivists Within Florida

one distance value. Consistent with standard practice in chi-square tests, count categories were combined to ensure no observation counts fell below the minimum of five. Results are shown in Table 5. Three of the four tests indicated no significant differences between the distributions of counts for recidivists and nonrecidivists. The only significant difference was found for the count of schools within a 2,500-ft buffer. Although the chi-square test itself does not reveal any particular direction, visual inspection of the results in Table 4 suggests that nonrecidivists are more likely than recidivists to have at least one school within 2,500 ft. Multiple iterations of the chi-square test using only two categories (count = 0 vs. count > 0, count ≤ 1 vs. count > 1, etc.) indicate that the strongest difference between the two populations occurs when comparing the counts for zero or one school within 2,500 ft (103 vs. 128) and more than one school within 2,500 ft (62 vs. 37). This finding confirms that the only statistically significant difference found is the result of nonrecidivists having more schools in close proximity than recidivists.

PROXIMITY AND RECIDIVISM

The distances to the nearest daycare and school for both populations are plotted as cumulative distribution functions in Figures 3 and 4, respectively. The results for distance to the nearest daycare indicate that there is very little difference in the two distance curves up

TABLE 4: Counts of Daycares and Schools Within Buffers Around Offenders

Count	Number of Daycares Within 1,000 Ft		Number of Daycares Within 2,500 Ft		Number of Schools Within 1,000 Ft		Number of Schools Within 2,500 Ft	
	Nonrecidivists	Recidivists	Nonrecidivists	Recidivists	Nonrecidivists	Recidivists	Nonrecidivists	Recidivists
0	116	115	65	57	123	127	68	77
1	31	28	30	35	26	25	35	51
2	12	12	14	19	13	10	35	21
3	5	7	17	21	2	2	12	11
4	1	1	13	15	1	1	7	3
5	0	1	8	8	0	0	7	1
6	0	0	7	6	0	0	1	1
7	0	0	4	1	0	0	0	0
8	0	0	3	1	0	0	0	0
9	0	1	1	1	0	0	0	0
10	0	0	0	1	0	0	0	0
>10	0	0	3	1	0	0	0	0
Sum	165	165	165	165	165	165	165	165

TABLE 5: Results of Chi-Square Tests for Counts of Daycares and Schools Within Buffers When Comparing Recidivists to Nonrecidivists

Test	χ^2	df	Two-Tailed p Value
Daycares within 1,000 ft	1.930	3	.587
Daycares within 2,500 ft	10.581	6	.102
Schools within 1,000 ft	0.858	2	.651
Schools within 2,500 ft	35.496	4	<.001

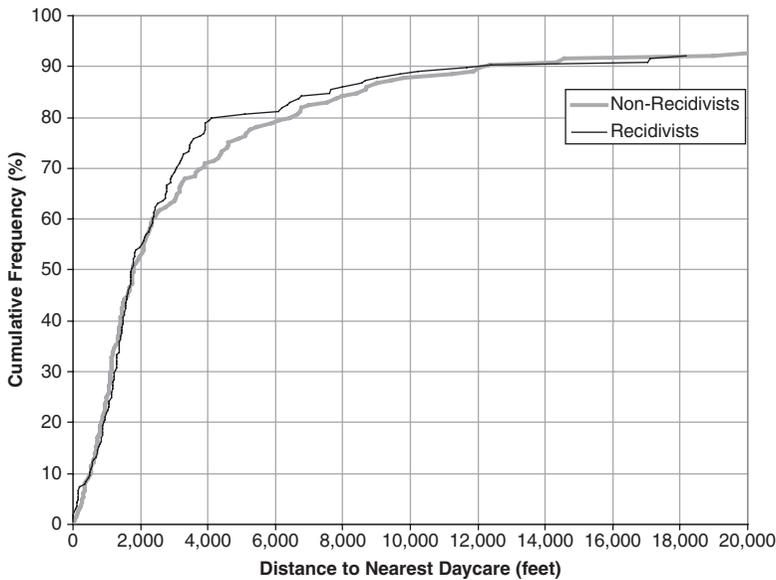


Figure 3: Cumulative Distribution Function of Distance to Nearest Daycare

until approximately 2,000 ft, indicating that recidivists and nonrecidivists are located at very similar distances when considering these shorter distances. At greater distances, the curve for recidivists is above the curve for nonrecidivists, indicating that a larger proportion of recidivists live between approximately 2,500 and 4,000 ft. At greater distances, the difference gets smaller again.

The results for the distance to nearest school indicate that the curve for recidivists falls below the curve for nonrecidivists up until approximately 3,500 ft, indicating that a smaller proportion of recidivists is located close to schools at these distances. At greater distances, the curve for recidivists exceeds the curve for nonrecidivists, indicating that a larger proportion of recidivists live between approximately 3,500 and 10,000 ft. The curves become very similar at greater distances.

Statistical testing is necessary to determine the significance of the differences between the curves in Figures 3 and 4. A common test for comparing these distributions is the Kolmogorov-Smirnov test. However, the Kolmogorov-Smirnov test determines the maximum differences between the curves, and it is clear from Figures 1 and 2 that this maximum difference occurs at fairly large distance values (approximately 4,000 ft for daycares

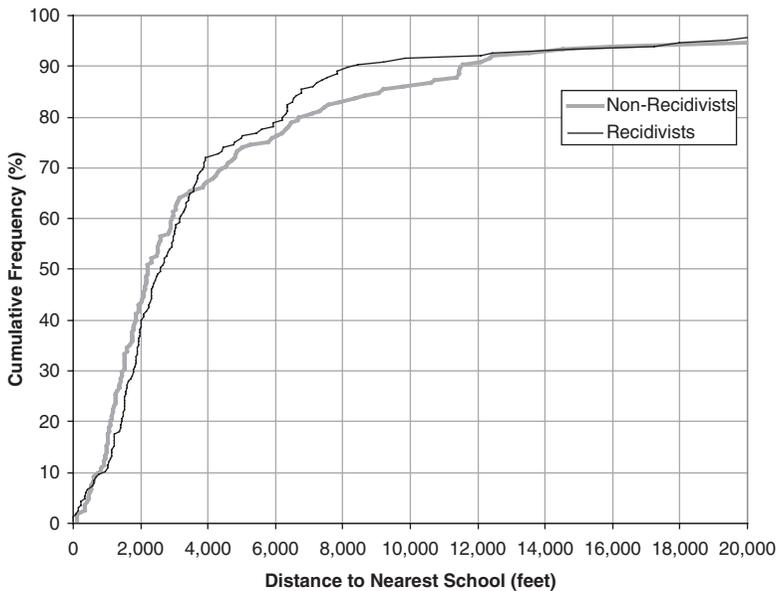


Figure 4: Cumulative Distribution Function of Distance to Nearest School

and 8,000 ft for schools), which fall outside of the values of interest. Therefore, differences were tested using parametric and nonparametric tests of means as well as chi-square tests for specific distance values of interest.

To assess whether sex offenders who lived closer to schools or daycares were more likely to reoffend sexually than those who lived farther away, we utilized two-tailed t tests to compare the mean distance that recidivists and nonrecidivists lived from schools and daycares and found no significant differences between the groups (see Table 6). Nonrecidivists lived slightly closer to daycares, and recidivists lived slightly closer to schools, but neither difference was statistically significant, indicating that these differences were not more than would be expected by chance. In other words, sex offenders who lived in closer proximity to schools and daycares were no more likely to reoffend than those who lived farther away. Because the distributions did not conform to all the assumptions of parametric comparisons of means, we performed a Mann-Whitney u test, a nonparametric test used for two samples measured on an ordinal scale (Mann & Whitney, 1947; Vogt, 2005). Again, there were no significant differences between recidivists and nonrecidivists in the distances they lived from schools ($p = .485$) and daycares ($p = .934$).

We also compared the proportions of recidivists and nonrecidivists who lived within common buffer zones using chi-square analyses (see Table 7). In these analyses, we tested three distances: the 1,000- and 2,500-ft zones used in previous analyses for the reasons stated above, and a distance zone of 1,500 ft—the distance designated in proposed legislation in 2008 in Florida for expanding the statewide buffer zone. Again, no significant differences were found, indicating that recidivists were not more likely to live within 1,000, 1,500, or 2,500 ft of schools or daycares than nonrecidivists.

We also examined the bivariate correlations between proximity and recidivism. There was a virtually nonexistent association between reoffending and proximity to schools ($r = .004$,

TABLE 6: Mean Distances From Schools and Daycares

	<i>Recidivist</i>	<i>n</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Standard Error Mean</i>	<i>t Test (Difference Between Groups)</i>	<i>Two-Tailed p Value</i>
Feet to daycare	no	165	5144.15	8655.80	673.85	-.075	.940
	yes	165	5219.76	9581.04	745.88		
Feet to school	no	165	5296.75	9029.17	702.92	.785	.433
	yes	165	4627.80	6198.25	482.53		

TABLE 7: Group Comparisons Between Recidivists and Nonrecidivists Based on Distance

<i>Proximity</i>	<i>Percentage of Recidivists Living</i>		<i>Percentage of Nonrecidivists Living</i>		χ^2	<i>Two-Tailed p Value</i>
	<i>Outside the Buffer Zone</i>	<i>Within the Buffer Zone</i>	<i>Outside the Buffer Zone</i>	<i>Within the Buffer Zone</i>		
Within 2,500 ft of a school	52	49	47	53	0.776	.378
Within 2,500 ft of a daycare	38	62	39	61	0.115	.734
Within 1,500 ft of a school	78	23	70	30	2.687	.102
Within 1,500 ft of a daycare	59	41	56	44	0.311	.577
Within 1,000 ft of a school	90	10	85	15	1.746	.186
Within 1,000 ft of a daycare	78	21	76	24	0.431	.511

Note. $df = 1$.

$p = .940$) or daycares ($r = -.043$, $p = .433$). Keeping in mind that the sample was matched on relevant risk factors (prior offenses, age, marital status, predator status), when the distances to schools and daycares were entered along with risk factors into a logistic regression model with recidivism as the dependent variable, neither distance variable was statistically significant ($p = .091$ and $p = .141$, respectively). The overall model was not statistically significant ($\chi^2 = 5.767$, $df = 7$, Nagelkerke $R^2 = .024$, $p = .567$), indicating that proximity to schools and daycares, with other risk factors being comparable, explains virtually none of the variation in sexual recidivism.

DISCUSSION

This study represents a pioneering effort to determine whether evidence exists to support the widespread enactment of residential restriction laws. The results of this study indicate no empirical association between where a sex offender lives and whether he reoffends sexually against a minor (recidivists who reoffended against adults were not included in the current analysis). Sex offenders who lived in closer proximity to schools and daycares were not more likely to reoffend than those who lived farther away.

It is important to recognize that our recidivists were defined as those on the registry who reoffended with a new sex offense arrest date in 2004, 2005, or 2006. Nonrecidivists during the follow-up time frame were matched based on the risk factors of the recidivists, and therefore there was no chance of selecting a nonrecidivist with no priors. In other words, neither group included first-time offenders, but recidivists were defined as those who reoffended

during the time frame in which we could calculate their proximity to schools and daycares. This sample is, therefore, a more high-risk sample than a randomly selected sample would be and was not intended to represent the general sex offender population in Florida.

The sample included offenders living in counties throughout the state. Rural counties have a wider dispersion of schools and daycares compared to metropolitan areas, which increased the average distance these offenders lived from the venues of interest. Mean distances to schools and daycares are likely to be closer for offenders living in urban and suburban communities than the average distances found in this study. Several researchers have indicated that more than 90% of residential dwellings in metropolitan areas are located within 2,500 ft of schools and daycares (Chajewski & Mercado, 2008; Zandbergen & Hart, 2006). Because most of these sex offenders are presumably subject to state laws and local ordinances restricting where they may reside, however, it is not surprising that many of them lived outside common buffer zones. Those living within buffer zones might have established their residence prior to the enactment of local ordinances and thus been grandfathered in.

Protection of children from sexual predators is an important policy endeavor. Strategies employed to accomplish that objective should therefore be informed by research to enhance the probability of their success. The current data suggest that the expenditure of resources allocated to the implementation and enforcement of residence restrictions does not appear to be justified and might be better targeted toward other methods of community protection. A glaring irony of residence restrictions is that they regulate only where offenders sleep at night and not where they travel during daytime hours when children are more vulnerable to sexual predation. It is therefore perhaps unsurprising that housing restrictions do little to deter reoffending.

As applied to sex offenders' housing, RAT does not appear to be a viable theoretical foundation for residential restriction policies. Living close to a school or daycare does not appear to increase access to children in a way that facilitates recidivism for known sex offenders. RAT might, however, better explain the risk associated with access to youngsters when sex offenders visit places where children are commonly found and where familiarity, authority, and relationships with children can be cultivated. Child safety zones have been enacted in some jurisdictions as an alternative to policies that regulate living arrangements. Child safety zones prevent sex offenders from loitering in places where children congregate (e.g., schools, parks, arcades, pools, ball fields, etc.) without a legitimate reason and prior approval. Such laws serve the purpose of prohibiting known sex offenders from being able to linger in places where they can engage in grooming practices by becoming familiar to children and their parents and developing relationships by which opportunities for sexual abuse become possible.

Residence restriction zones create barriers to reentry and inhibit the factors known to contribute to successful reintegration, such as employment, housing stability, prosocial relationships, and civic engagement (Mayzer, Gray, & Maxwell, 2004; Schulenberg, 2007; Willis & Grace, 2008, 2009). When criminal offenders sustain jobs and social bonds, they are more likely to become invested in conformity and community norms. Housing instability, transience, unemployment, and a lack of support systems are known to increase the likelihood of recidivism for criminal offenders in general and sex offenders specifically. Alternatives to residence restrictions, such as loitering zones, are more likely to manage risk while simultaneously removing obstacles to reintegration and facilitating a better chance of a safe return to community settings.

LIMITATIONS

As with any study, the current investigation is not without certain limitations. In general, these limitations are related to (a) the size of the sample, (b) the sampling strategy, (c) measures of certain variables, (d) the types of restriction locations selected, (e) the geocoding techniques implemented, and (f) the analytic approach employed. Each of these limitations is addressed in detail below.

One of the limitations of this study is the relatively small sample size that was employed. Several factors influenced the size of the sample. First, the time period considered was relatively short (2004-2006). Second, only those recidivists with reliable demographic and address information were included. Third, only those recidivists who were arrested for a sex offense against a minor were included. Fourth, incomplete geocoding removed a few more cases. Nonetheless, the sample size was sufficient for regression models with the six covariates and for statistical comparisons between recidivists and nonrecidivists.

The second limitation is the design employed in the sampling of the nonrecidivists. By creating a stratified random sampling technique based on risk factors and demographic variables, the nonrecidivist population was nearly identical to the recidivist population. Although this allowed for a direct comparison of the proximity metrics, it prevented an analysis of the interaction between risk factors and proximity. A future research study is planned in which recidivists will be compared to a randomly selected sample of nonrecidivists.

A third and related limitation is that inherent in the database provided by FDLE was the paucity of data available to us regarding other potential risk factors for recidivism. Along with the risk factors identified in this study, future research should include additional covariates, such as time at large, a measure of housing instability or transience, the influence of urban versus rural locations, victim's age and gender, and relationship between the offender and the victim. These covariates could be used to better understand the relationship between proximity and recidivism while controlling for other risk factors. A related limitation is that it is not known where the offenders established contact with the victims. However, the purpose of the study was to determine the relationship between recidivism and residential proximity to daycares and schools, independent of whether the contact occurred at those locations.

The fourth limitation is that only daycares and schools were considered facilities of interest. Florida statutes include parks, playgrounds, and public school bus stops (for conditional releasees), and many local ordinances include additional locations such as libraries or recreational facilities. However, daycares and schools are among the most commonly used categories in residence restriction laws across the nation. With the exception of public school bus stops, the volume of the other types of facilities is also much lower than for schools and daycares. School bus stops are so plentiful throughout residential areas that almost every resident (offender or not) lives close to one (Zandbergen and Hart, 2006), making their utility in proximity analyses less meaningful.

The fifth limitation is that geocoding techniques introduce some amount of positional error. Street geocoding in general can introduce substantial error, and therefore parcel-level geocoding was employed to the extent possible based on available data. Despite the very high proportion of records matched at the parcel level and the very high overall match rate, some amount of error is introduced as a result of incomplete address information (in particular for home-based daycares) and positional error in the geocoding techniques. Nonetheless,

there is no indication that these errors introduced any form of bias in the comparison of recidivists and nonrecidivists.

The final limitation is that relatively simple proximity metrics were used, including the straight-line distance to nearest facility and number of facilities within discrete buffer zones. Such metrics do not account for more complex interactions, such as visibility (e.g., can the offender see the daycare or school from his residence?) or casual contact (e.g., if the offender walks or drives from his house to the nearest major intersection or to his place of work, does he pass a daycare or school?). The metrics employed, however, reflect the language found in current residence restriction laws.

CONCLUSION AND POLICY IMPLICATIONS

Given the paucity of data suggesting that sex offender residence restrictions prevent recidivism and the growing body of evidence indicating that housing policies increase transience, homelessness, and unemployment, these laws may be contraindicated. The belief that keeping sex offenders far from schools and other child-friendly locations will protect children from sexual abuse appears to be a well-intentioned but flawed premise. The data from this study do not support the widespread enactment of residential restrictions for sexual offenders. The time that police and probation officers spend addressing sex offender housing issues is likely to divert law enforcement resources away from behaviors that truly threaten our communities.

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