Prison Visitation, Spatial Distance and Concentrated Disadvantage of Visitor Neighborhoods, and Offender Recidivism

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Research Summary

Since prisoners who receive visits while incarcerated are less likely to recidivate, scholars have studied predictors of visitation, finding that the distance that visitors must travel affects how often they visit, as do characteristics of the visitors' neighborhoods. This study examines whether spatial distance between visitors and correctional facilities and visitors' neighborhood disadvantage are related to recidivism. These questions are assessed using data from a sample of approximately 2,600 inmates released from Minnesota state prisons. The results of Cox regression models showed that, among offenders who received visits, reconviction was less likely when visitors traveled longer distances, although this varied somewhat based on the measurement used to capture distance. Visitors' neighborhood disadvantage was not related to reconviction. These findings highlight the importance of visitation for maintaining social ties in the community, and suggest that some visits (such as those from distant visitors) may be especially beneficial for reducing recidivism.

Introduction

Over the last several decades, American correctional systems have increasingly relied on the risk-needs-responsivity (RNR) model to guide the delivery of programming. The RNR model holds that programming should: 1) be calibrated to an individual's risk for recidivism, 2) target known criminogenic needs or dynamic risk factors, and 3) be tailored to the abilities, strengths, and learning styles of offenders. According to Andrews, Bonta, and Wormith (2006), there are eight central risk factors (or criminogenic needs) for recidivism. Of the eight, four (the "big four") are considered especially influential for reoffending—antisocial history, antisocial personality, criminal thinking, and antisocial peers. Antisocial history is the strongest predictor of recidivism, but it also happens to be a static factor that cannot be modified through programming (Durose, Cooper, & Snyder, 2014; Gendreau, Little, & Goggin, 1996). Because the remaining three of the "big four" are dynamic risk factors, these criminogenic needs can presumably be addressed through interventions (Andrews, Bonta, & Wormith, 2006).

Even though anti-social peers is considered a major risk factor for recidivism, there are relatively few formal institutional programs that are dedicated to addressing this criminogenic need by helping offenders establish or enhance pro-social sources of support. Prison visitation is arguably the most prominent source of pro-social support for prisoners, but it is seldom regarded as a type of correctional program. Unlike most other programs, which are limited in the number of prisoners they can serve, there is rarely a limit as to how many prisoners can receive visits. With no clearly-defined points at which prisoners must enter and eventually exit, visitation does not have a curriculum that inmates must master in order to complete it. Instead, visitation is similar to prison labor, which is typically regarded as a type of programming. As long as employment is available, eligible prisoners frequently work in prison for as long as they can or at

least until they get released. Likewise, as long as friends and family members are able to visit, willing and eligible prisoners typically accept as many visits as they can during their confinement.

Because prison visitation generally provides offenders with pro-social support, thereby addressing a major criminogenic need, existing research has shown that visited inmates tend to have less recidivism. The findings from studies on prisoners from Florida (Bales & Mears, 2008; Cochran, 2014; Mears et al., 2012), Minnesota (Duwe & Clark, 2013), and Canada (Derkzen, Gobeil, & Gileno, 2009) suggest that offenders who are visited more often in prison are less likely to recidivate. In addition, a recent meta-analysis by Mitchell, Spooner, Jia, and Zhang (2016) reported that visitation is associated with a 26 percent reduction in recidivism.

Mainstream criminological theories have emphasized the importance of social bonds and social support in facilitating the desistance from crime. Recidivism is less likely, according to social control theory, when a released prisoner forms an attachment, or bond, to a conventional lifestyle (Hirschi, 1969). Similarly, from a life-course perspective, the release from prison is a potential turning point in which the attachment to supportive friends and family members can help bring about desistance for released prisoners (Horney, Osgood, & Marshall, 1995). And general strain theory suggests that social support can help lower recidivism by easing the stresses precipitated by a transition from prison to the community (Agnew, 1992).

While inmates are in prison, visits provide a means of developing, maintaining, or even improving social support networks. Because many released prisoners rely on family and friends for employment opportunities, financial assistance, and housing (Berg & Huebner, 2010; Visher et al., 2004), these networks can be critical to a successful reentry from prison. Moreover, by strengthening ties with pro-social sources of support, visits may also help prevent prisoners from

assuming a criminal identity (Rocque, Bierie, & MacKenzie, 2011).

Despite the theoretical and empirical basis for the positive effects of prison visitation on recidivism, the literature indicates that many offenders are not visited in prison. The rate of unvisited offenders in prior studies has ranged from a low of 39 percent (Duwe & Clark, 2013) to a high of 74 percent (Cochran et al., 2016). The relatively low visitation rates found among American prisoners have been attributed to restrictive visitation policies (Arditti, 2003; Austin & Hardyman, 2004; Farrell, 2004), inhospitable visitation settings (Sturges, 2002), travel and lodging costs (Christian, 2005; Fuller, 1993), and the physical distance between the facilities where inmates are confined and the communities where their potential visitors live (Casey-Acevedo & Bakken, 2002; Cochran et al., 2016; Schirmer, Nellis, & Mauer, 2009; Tewksbury & DeMichele, 2005). Existing research has observed that prisoners tend to come from heavily-populated urban areas that are geographically distant from the rural areas where most prisons are located (Austin & Hardyman, 2004; Cochran et al., 2016; Schirmer et al., 2009).

Recently, Cochran and colleagues (2016) examined the distance between inmates' county of conviction and the prisons in which they were housed, observing that visitation was less frequent among inmates whose home counties were farther away. Clark and Duwe (2017) measured the effects of physical distance and social disorganization on the frequency of visitation among 2,817 Minnesota prisoners released in 2013; notably, their study used visitor addresses rather than county of conviction to measure distance and social disorganization. Clark and Duwe (2017) estimated the effects of distance by performing multilevel repeated measure analyses, measuring the frequency of visitation across the different facilities at which inmates were housed, the different neighborhoods from which they received visits, and between-inmate differences in visitation frequency. They found that as the distance between visitors and prisons

increased, the frequency of visitation decreased. In addition, Clark and Duwe (2017) reported that higher levels of concentrated disadvantage in the neighborhoods where visitors lived were associated with less visitation. That is, all else being equal, the frequency of visitation was lower for residents of more disadvantaged neighborhoods.

Scholars have begun to explore whether spatial distance is related to outcomes other than visitation; for example, Lindsey and colleagues (2017) tested the relationship between distance (based on inmates' county of conviction) and institutional misconduct. They found that distance was positively related to misconduct (although the effect became negative after approximately 350 miles). This relationship was partially mediated by distance's effect on visitation, which tends to reduce misconduct (Mitchell et al., 2016), but the results suggest that distance was directly related to misconduct as well. However, the relationship between distance and recidivism has not yet been tested. Further, the study by Lindsey et al. (2017) measured the distance of the offender's county of commitment, not the distance of the offender's visitors.

Given that the study by Clark and Duwe (2017) was the first to quantitatively evaluate the relationship between visitors' distance and visitation, important questions remain about the effects this relationship may have on recidivism. Does the physical distance a visitor has to travel influence the effect of visitation on recidivism? That is, are visits from those who travel long distances more beneficial in reducing recidivism than visits from those who travel shorter distances? And, does the level of concentrated disadvantage in the neighborhood where the visitor lives affect recidivism?

The Current Study: Visitor Neighborhoods, Visitation Frequency, and Recidivism

This study examines whether characteristics of visitors' neighborhoods (i.e., spatial distance to facilities and disadvantage) are related to recidivism once offenders are released from

prison. More specifically, we test three hypotheses regarding distance, disadvantage, visitation, and recidivism. First, Lindsey et al. (2017) observed that distance increased institutional misconduct partially through its reduction of visitation. Following this argument, it is possible that visitors' neighborhoods may indirectly increase recidivism. Prior research shows that spatial distance and neighborhood disadvantage reduce visitation (Clark & Duwe, 2017; Cochran et al., 2016), and visitation, in turn, appears to reduce recidivism (Bales & Mears, 2008; Cochran 2014; Duwe & Clark, 2013; Mitchell et al., 2016). Therefore, greater spatial distance and neighborhood disadvantage of visitors' homes could be expected to indirectly increase recidivism.

Second, because distance could affect offender-visitor relationships in ways beyond visitation frequency, we hypothesize that the distance between incarcerated offenders and their visitors will have protective effects against recidivism. When visitors travel a long way, these visits might be more meaningful, which may inspire greater change among offenders. Scholars suggest that prison visitation makes offenders aware of the effect of their incarceration on others, thereby inspiring change (Liu, Pickett, & Baker, 2014; Brunton-Smith & McCarthy, 2017). Following this idea, the distance traveled may further heighten this awareness and motivation to change. When visitors travel a greater distance, offenders may perceive reoffending as having even greater risk of damaging their relationships with others.

In addition to these potential ways that distance could impact recidivism, the distance traveled by visitors may not only exert an effect but also reveal important information about the relationship between the offender and the visitor. In particular, high-quality relationships may inspire visitors to travel greater distances to visit, and recent research shows that the quality of inmates' relationships before incarceration are especially important for recidivism (Atkin-Plunk & Armstrong, 2018). Visitors who travel farther to see incarcerated offenders may have greater

stakes in their success after release, which could equate to more willingness to put forth effort and resources to help offenders successfully transition from prison to the community. In addition, visitors who are financially able to travel longer distances to visit their incarcerated loved ones may have more resources at their disposal to assist with the reentry process. For these reasons, offenders whose visitors travel a long way to visit may receive more help from their social networks after release, making them less likely to reoffend.

Third, we examine whether there is a direct relationship between visitors' neighborhood context and recidivism. We expect that offenders whose visitors live in disadvantaged neighborhoods will have higher risk of recidivism. Because released offenders often live with family members or friends (Steiner, Makarios, & Travis, 2015), offenders whose visitors live in disadvantaged neighborhoods may move into disadvantaged areas after release, which can increase recidivism (Kubrin & Stewart, 2006; Hipp, Petersilia, & Turner, 2010; Clark, 2016; McNeeley, 2018a, 2018b). In addition to visitors who offer housing to releasees, the neighborhood context of other visitors may also matter: Criminologists have noted that non-residential activity spaces (i.e., the broader network of neighborhoods, beyond the home neighborhood, that make up one's environment) may be important in shaping criminal behavior and have called for more research on these contexts (Wikström et al., 2010; Graif, Gladfelter, & Matthews, 2014). However, the literature on recidivism has not yet examined other areas in which offenders might spend time after their release from prison, such as communities where their family members or friends live.

In addition, characteristics of the neighborhoods in which visitors live may also offer context for understanding the visitor-offender relationship. In particular, visitor neighborhood disadvantage may signal an inability to assist offenders with the reentry process: Those who live

in disadvantaged neighborhoods may have less resources that enable them to help offenders after their release. Offenders' family members and friends from disadvantaged communities likely have limited financial resources available to help the offender overcome obstacles such as lack of housing or transportation. They may also have fewer connections to potential employers or less access to social services.

Research Methods

Data and Sample

The above hypotheses were tested using a sample of adult offenders released from Minnesota state prisons in 2013. The sample only included offenders who were in prison at least 30 days[1] and received at least one visit[2] during their most recent incarceration (n = 2,817). Offenders (n = 62) were removed from the sample if they were deceased, fugitives, released on conditional medical release, released with a hold from another agency, or released to a different state. In addition, a key control variable in this study is the offender's Level of Service Inventory-Revised (LSI-R) score. Therefore, offenders without an LSI-R score (n = 117) were removed from the sample. This resulted in a sample of 2,638 offenders.

Data on offenders and their visitors were collected from the Correctional Operations Management System (COMS), where offenders' visitor lists are maintained.[3] Because

[1] Offenders who were incarcerated fewer than 30 days were eliminated from the data for two reasons. First, some are committed to prison for only a few days or a week; these offenders likely spent most of their incarceration periods in county jails awaiting trial. Second, after examining the data and conferring with Minnesota Department of Corrections (MnDOC) staff, it was determined that 30 days is a reasonable amount of time for offenders to prepare for and receive visits. Visitors must apply to visit offenders and undergo a background and outstanding warrant check, and offenders must set up their visitor lists. Offenders may be responsible for relaying visitation information to potential visitors, which is done via the U.S. Postal Service.

[2] 59% of offenders released in 2013 did not receive any visits and were therefore not included in the sample. Ideally, we would be able to examine all offenders, including those who received no visits. However, visitor address information was only available for offenders who received visits. We do not use offenders' pre-incarceration addresses because this information is not consistently available or accurate. In addition, we use visitors' addresses rather than pre-incarceration addresses because offenders do not necessarily come from the same areas as their visitors.

[3] In Minnesota, individuals must apply to be added to an offender's visitor list. All of the visitors included in the

individuals from the same households or neighborhoods often visited an offender together in small groups (especially when offenders had visits from minor children), visitors who lived in the same neighborhood were grouped together and the census tract in which they lived was used as the geographic location. Characteristics of visitors' neighborhoods were measured using data from the 2013 American Community Survey.

The sample of offenders was 89% male. Over half (58%) were non-Hispanic White, 29% were Black, 6% were American Indian, 5% were Hispanic, and 2% were Asian. The released offenders ranged in age from 18 to 73, with an average age of approximately 33 years. A quarter (25%) of the offenders were incarcerated for drug offenses, while 22% were incarcerated for person offenses, 14% were incarcerated for property offenses, 13% were incarcerated for sexual offenses, 11% were incarcerated for driving while intoxicated (DWI), and 15% were incarcerated for other offenses. The number of prior convictions ranged from 0 to 33, with an average of 4.89.

Dependent Variables

The outcome variable in this study, recidivism, was measured as a conviction for any new offense after release from prison. Supplemental analyses were conducted using reconviction for a new felony offense rather than any new offense. Reconviction data were obtained from the Minnesota Bureau of Criminal Apprehension (BCA). Data were collected through December 31, 2016; therefore, the study covers recidivism for three to four years after release (36 to 47 months, mean follow-up period = 41.5 months). 48% of the sample was reconvicted for a new offense during the follow-up period. Descriptive statistics for all variables are provided in Table 1.

Reconviction was the focus of the main analyses because it is a moderate measure that is neither too sensitive nor too conservative in estimating reoffending. While reconviction may not

study visited at least one time.

Table 1: Descriptive Statistics

	Mean	SD	Range
Dependent Variables			
Reconviction for any new offense	.48	.50	0-1
Reconviction for a new felony offense	.33	.47	0-1
Rearrest	.59	.49	0-1
Reincarceration	.20	.40	0-1
Revocation	.40	.49	0-1
Visitors' Distance			
Average distance (miles)	109.9	191.28	2.5-4899.6
Shortest distance (miles)	57.9	110.13	0-1545
Highest distance (miles)	205.16	463.69	2.5-9389.6
Proportion of observations with visitors far	.48	.39	0-1
Proportion of visitors always far	.33	.43	0-1
Any visitors always far	.44	.50	0-1
All visitors always far	.25	.43	0-1
Visitors' Neighborhood Disadvantage			
Average neighborhood disadvantage	.18	.93	-1.18-5.16
Proportion of visitors in disadvantaged neighborhood	.49	.42	0-1
Any visitors in disadvantaged neighborhood	.68	.47	0-1
All visitors in disadvantaged neighborhood	.31	.46	0-1
Additional Independent Variables			
Average visits per month	2.34	3.33	0.01-34.00
Number of visitors	4.04	3.96	1-57
LSI-R at release	30.41	8.23	3-50
Number of treatment programs	.95	1.06	0-6
Male	.89	.31	0-1
Minority	.42	.49	0-1
Married	.10	.31	0-1
Age at release (in years)	33.47	9.6	18-73
High school degree or GED at release	.86	.35	0-1
Length of stay (in months)	19.6	24.1	1-331
Discipline convictions	4.28	11.24	0-172
New commitment	.82	.38	0-1
Metro commitment	.51	.50	0-1
Prior record	.03	1.01	-1.12-5.85
Prior convictions	4.89	4.6	0-33
Prior supervision failures	1.43	1.64	0-14
Supervision type			
Standard supervision or treatment program (reference group)	.77	.42	0-1
ISR	.19	.39	0-1
Discharge	.04	.21	0-1

Offense type			
Person (reference group)	.22	.41	0-1
Property	.14	.35	0-1
Drug	.25	.43	0-1
Sexual	.13	.34	0-1
DWI	.11	.31	0-1
Other	.15	.36	0-1

capture as much reoffending as rearrest, it is less likely to include crimes that were not committed by the offender, without being as conservative as reincarceration. Supplemental analyses were conducted using other measures of recidivism (rearrest for a new offense, reincarceration for a new felony offense, and return to prison due to revocation of supervised release). The results of the supplemental analyses are summarized below.

Independent Variables

The three independent variables of interest are visitation frequency, distance between visitors and facilities, and visitor neighborhood characteristics. First, visitation frequency was measured as the number of visits that offenders received while incarcerated. The offenders in the sample received between 1 and 1,190 visits during their incarceration, with an average of about 38 visits. Because visitation frequency is somewhat dependent upon the length of incarceration, a monthly number of visits was calculated by dividing the total number of visits by the number of months that the offender was incarcerated. The visitation variable was positively skewed, so the natural log of the monthly number of visits per month is used in the analyses.

Second, the distance between visitors' addresses and the correctional facilities in which offenders were housed[4] was based on the latitude and longitude of the prison and the census tract

[4] In Minnesota, adult males entering prison for a new sentence are admitted to MCF-St. Cloud for intake. Most are then transferred to another facility based on security classification (minimum, medium, closed, and maximum), programming needs and availability, and administrative concerns (e.g., available bed space). Subsequent transfers may be made if these considerations change (e.g., changes in an offender's security classification). Male offenders entering prison due to supervised release revocation can be admitted to any male facility, and may be transferred if

in which the visitor lived.[5] The distance between visitor neighborhoods and facilities was calculated using the Haversine formula (a straight-line measure of distance). Distance was measured in one-hundredths, so that 100 miles is equal to one-mile increments. Offenders may have had multiple visitors and, due to transfers, may have been housed at multiple facilities during their sentence.[6] We calculated the distances between all facilities where an offender was housed and all of his or her visitors' addresses. These distances were then combined in order to measure distance at the offender level. Seven measurements of the overall distance between an offender's facility placements and his or her visitors were created:

1. Average distance between all of an offender's visitors' neighborhoods and all of the facilities where he or she was housed[7]
2. Shortest distance between facilities and visitors' neighborhoods during an offender's entire incarceration
3. Highest distance between facilities and visitors' neighborhoods during an offender's entire incarceration
4. Proportion of observations in which an offender's visitor lived more than 60 miles[8] away from the facility
5. Proportion of an offender's visitors who *always* lived more than 60 miles away from all facilities where offenders were incarcerated
6. Binary measure of whether *any* of an offender's visitors always lived more than 60 miles away from all facilities where offenders were incarcerated
7. Binary measure of whether *all* of an offender's visitors always lived more than 60 miles away from all facilities where offenders were incarcerated

Third, visitors' neighborhood disadvantage was measured using data from the U.S. Census Bureau's American Community Survey 5-year estimates. We created a factor score

necessary. Female inmates are housed at MCF-Shakopee, with the exception of women participating in Minnesota's Challenge Incarceration Program (CIP; see Duwe & Kerschner, 2008), which at the time of data collection was located at MCF-Togo.

[5] Unfortunately, while the distance between one's home community and the facility may influence visitation or recidivism, offenders' pre-incarceration addresses were not available because this information is not consistently recorded or verified by MnDOC staff. In addition, the offender's home community may not correctly identify areas where potential visitors live, as only 42% of visitors lived in a county that was the same as the offender's county of commitment (Clark & Duwe, 2017).

[6] About two-thirds (67.8%) of offenders in the sample were transferred at least once during their sentence. Offenders in the sample were housed in 1-7 facilities during their sentence (average = 1.93).

[7] Because the distributions for average distance, shortest distance, and highest distance were all positively skewed, the natural log was taken and used in the analyses. Because the variable for shortest distance included cases with values of 0, 1 was added to this variable before taking the natural log.

[8] The 60 mile cutoff was chosen because it was the median distance between visitors and facilities.

comprised of the following five variables: percent female-headed household, percent families in poverty, percent civilian labor force unemployed, percent receiving cash assistance, percent receiving food stamp or Supplemental Nutrition Assistance Program (SNAP) benefits in the past year (Cronbach's $\alpha = .906$, eigenvalue = 3.692, factor loadings between .776 and .949). As with distance, all of an offender's visitors were combined to create an offender-level measurement of visitor neighborhood disadvantage. The overall disadvantage of offenders' visitors' neighborhoods was measured in four ways:

1. Average concentrated disadvantage score for all of an offender's visitors' neighborhoods
2. Proportion of an offender's visitors who lived in disadvantaged neighborhoods[9]
3. Binary measure of whether *any* of the offender's visitors lived in disadvantaged neighborhoods
4. Binary measure of whether *all* of the offender's visitors lived in disadvantaged neighborhoods

Control Variables

In addition, several control variables were used. First are four demographic characteristics measured as binary variables: gender (male), race (minority, compared to non-Hispanic White), marital status (married, compared to other marital statuses), and education level at the time of release (at least a high school diploma or GED). Next are five characteristics of the offender's current sentence and incarceration: the number of effective treatment programs (i.e., programs that evaluations have shown are effective) in which the offender participated during the current sentence, the length of the prison stay (in months), the number of discipline convictions during the current sentence, a binary variable measuring whether the offender was a new commitment (compared to those returned to prison for a release violation), and a binary variable measuring whether the offender was committed from the seven-county Minneapolis-St.

[9] Neighborhoods were considered "disadvantaged" if the concentrated disadvantage score was above the median (median = -0.142).

Paul metropolitan area.

Age at the time of release was a continuous variable measured in years. Offense type was measured with several dichotomous variables that indicated whether the offender's current sentence was a person (reference group), property, drug, sexual, DWI, or another type of offense. The offender's most recent LSI-R score before being released from prison was included to account for individual risk of recidivism. Prior record was measured as a factor score using the number of prior convictions (not counting the current sentence) and the number of prior supervision (i.e., probation and supervised release) failures (eigenvalue = 1.436, factor loadings above 0.847). Finally, supervision type was measured with dummy variables that indicated whether the offender was discharged with no supervision, released on standard supervision (reference group), or released on intensive supervised release (ISR).

Data Analysis

Survival analysis was used to examine recidivism. This method is preferable for studying recidivism because it allows for an examination of not only whether offenders recidivate, but also how soon after their release the recidivism occurs. Specifically, we estimated Cox regression models, which use both time and status variables to estimate the relationship between the independent and dependent variables. Here, the "status" variable measures whether an offender recidivated, while the "time" variable measures the amount of time from the release date until the date of the first recidivism incident (or December 31, 2016 for those who did not recidivate). The data are structured as offenders clustered within the prisons from which they were released, which can introduce bias: offenders released from the same facility may be more similar to each other than they are to those released from other facilities. Therefore, we used robust standard errors (specifically, the Huber-White sandwich, see Rogers, 1993; Wooldridge,

2002) to account for clustering of offenders within prisons.[10]

Results

Bivariate Results

Table 2 presents the bivariate correlations between reconviction, visitation frequency, spatial distance between visitors and incarcerated offenders, and visitor neighborhood disadvantage. All of the distance variables were negatively correlated with visitation; in other words, visitation became less frequent as distance between visitors and facilities increased. Similarly, most of the neighborhood disadvantage variables were negatively associated with visitation; offenders whose visitors lived in disadvantaged areas received fewer visits. However, one of the disadvantage variables had a positive association with visitation: offenders with any visitors living in a disadvantaged area received more visits than did offenders who had only visitors from more affluent areas.

Offenders who received more visits while incarcerated were less likely to be reconvicted. Several indicators of distance were related to reconviction. In general, these correlations indicate that reconviction was less likely when there was a greater distance between offenders and their visitors. The bivariate results for neighborhood disadvantage were less clear. Reconviction was less likely when offenders had *any* visitors living in disadvantaged neighborhoods, but was more likely when *all* of an offender's visitors lived in disadvantaged neighborhoods.

[10] Because there are only ten correctional facilities represented in the data, there are not enough Level 2 units to conduct multilevel analyses (see Raudenbush & Bryk, 2002).

Table 2: Bivariate Correlations Between Recidivism and Visitor Neighborhood Characteristics

	Number of visits	Reconviction
Number of visits received	---	-.091**
Visitor distance		
Average distance (miles)	-.169**	-.063**
Shortest distance (miles)	-.252**	.004
Highest distance (miles)	-.075**	-.102**
Proportion of observations with visitors far away	-.189**	-.076**
Proportion of visitors always far	-.160**	-.058**
Any visitors always far	-.051**	-.104**
All visitors always far	-.202**	-.009
Visitor neighborhood disadvantage		
Average neighborhood disadvantage	-.065**	-.003
Proportion of visitors in disadvantaged neighborhood	-.066**	.007
Any visitors in disadvantaged neighborhood	.088**	-.043*
All visitors in disadvantaged neighborhood	-.179**	.050**

**p < .01, *p<.05

Multivariate Results

The results of the multivariate Cox regression models are presented in Table 3. The different measures of visitor neighborhood disadvantage showed similar results; therefore, to ease presentation, only the models using one of these measures (average visitor neighborhood disadvantage) were included in Table 3.[11] First, we examined the relationship between reconviction and visitors' distance from facilities during offenders' incarceration. Five of the seven distance variables were significantly related to reconviction: average distance between visitors and facilities (hazard ratio = 0.88, $p < .05$), highest distance between visitors and facilities (hazard ratio = 0.88, $p < .01$), proportion of observations in which visitors were more than 60 miles away from the facility where the offender was housed (hazard ratio = 0.83, $p < .01$), proportion of an offender's visitors who were always more than 60 miles away from the facility in which he or she was housed (hazard ratio = 0.86, $p < .01$), and having any visitors who

[11] All full models are available upon request.

lived more than 60 miles away from all facilities where offenders were housed while serving their sentence (hazard ratio = 0.85, $p < .01$). These associations all showed a negative relationship: greater distance between incarcerated offenders and their visitors was related to 12-17% lower risk of reconviction.

Second, it was also hypothesized that offenders with visitors from disadvantaged neighborhoods would be more likely to recidivate. Contrary to this hypothesis, average visitor disadvantage was not related to risk of reconviction (hazard ratio = 0.96, $p > .05$) in any of the models, nor were any of the other measures of visitor neighborhood disadvantage. Finally, consistent with prior research, the number of visits received was related to lower risk of reconviction (hazard ratio = 0.95, $p < .05$). More specifically, the risk of reconviction decreased by 4-5% with each additional visit.

Several of the control variables were also significantly related to reconviction. LSI-R, prior record score, and number of discipline convictions were related to higher risk of reconviction; the risk of reconviction increased by 3% for each one-unit increase in LSI-R, 30-31% for each one-unit increase in prior record score, and 1% for each additional discipline conviction. Age, length of stay, and the number of effective programs that an offender participated in during incarceration were associated with lower risk of reconviction; the risk of reconviction decreased by 3% for every year of age, 1% for each one-month increase in length of stay, and 11-12% for each additional treatment program completed. The risk of reconviction was 54-63% higher for males than females and 31-32% higher for property offenders than person offenders. The risk of reconviction was 29-30% lower for offenders on ISR. In two of the seven models, those who were incarcerated for drug offenses had 16% lower risk of reconviction than person offenders, while “other” offenders had 12-13% higher risk of reconviction.

Table 3: Cox Regression Models Predicting Reconviction

	1	2	3	4	5	6	7
Average distance	.88 (.05)*						
Shortest distance		1.00 (.03)					
Highest distance			.88 (.04)**				
Proportion far				.83 (.06)**			
Proportion always far					.86 (.05)**		
Any always far						.85 (.04)**	
All always far							.93 (.05)
Visitor neighborhood disadvantage	.96 (.38)	.97 (.04)	.96 (.38)	.96 (.04)	.96 (.04)	.96 (.04)	.96 (.04)
Number of visits received	.95 (.02)*	.96 (.02)	.95 (.02)*	.95 (.02)*	.95 (.02)*	.95 (.02)*	.95 (.02)*
LSI-R	1.03 (.01)***	1.03 (0.01)***	1.03 (.01)***	1.03 (.01)***	1.03 (.01)***	1.03 (.01)***	1.03 (.01)***
Treatment programs	.89 (.04)**	.88 (.04)**	.89 (.04)**	.89 (.04)**	.88 (.03)**	.89 (.04)**	.88 (.04)**
Male	1.61 (.20)***	1.54 (.17)***	1.63 (.21)***	1.59 (.18)***	1.55 (.18)***	1.54 (.18)***	1.55 (.18)***
Minority	1.13 (.04)**	1.12 (.04)**	1.12 (.04)**	1.12 (.04)**	1.12 (.04)**	1.12 (.04)**	1.12 (.04)**
Married	.90 (.09)	.88 (.08)	.90 (.09)	.90 (.09)	.89 (.09)	.89 (.09)	.89 (.09)
Age	.97 (.003)***	.97 (.003)***	.97 (.004)***	.97 (.004)***	.97 (.004)***	.97 (.004)***	.97 (.004)***
High school degree	.97 (.06)	.96 (.06)	.97 (.06)	.97 (.06)	.96 (.06)	.96 (.06)	.96 (.06)
Length of stay	.99 (.002)***	.99 (.002)***	.99 (.002)***	.99 (.002)***	.99 (.002)***	.99 (.002)***	.99 (.002)***
Discipline convictions	1.01 (.001)***	1.01 (.002)***	1.01 (.002)***	1.01 (.002)***	1.01 (.002)***	1.01 (.002)	1.01 (.002)***
New commitment	.92 (.10)	.86 (.10)	.93 (.10)	.88 (.10)	.86 (.10)	.86 (.063)	.86 (.10)
Metro commitment	.93 (.05)	.98 (.05)	.93 (.05)	.93 (.06)	.94 (.06)	.94 (.063)	.96 (.06)
Prior record	1.30 (.03)***	1.31 (.03)***	1.30 (.03)***	1.31 (.03)***	1.31 (.03)***	1.31 (.03)	1.31 (.03)***
Discharge, no supervision	1.00 (.16)	0.98 (0.15)	.99 (.16)	.97 (.15)	.97 (.15)	.97 (.15)	.98 (.15)
ISR	.71 (.06)***	0.70 (0.06)***	.71 (.06)***	.71 (.06)***	.71 (.06)***	.71 (.06)***	.71 (.06)***
Property offense	1.32 (.09)***	1.31 (0.09)***	1.32 (.09)***	1.31 (.09)***	1.31 (.09)***	1.31 (.09)***	1.31 (.09)***
Drug offense	.86 (.07)	0.84 (0.07)*	.86 (.07)	.85 (.07)	.84 (.07)	.84 (.07)	.84 (.07)*
Sexual offense	.76 (.12)	.76 (.12)	.77 (.12)	.76 (.12)	.75 (.12)	.75 (.12)	.76 (.12)
DWI offense	.94 (.08)	.91 (.08)	.95 (.08)	.93 (.08)	.92 (.08)	.93 (.08)	.92 (.08)
Other offense	1.12 (.06)*	1.11 (.08)	1.13 (.06)*	1.11 (.07)	1.11 (.07)	1.11 (.07)	1.11 (.07)

Hazard ratios are presented with robust standard errors in parentheses. N=2,638. ***p<.001, **p<.01, *p<.05

Next, we used the causal step test (Baron & Kenny, 1986) to test the possibility that the effects of distance or disadvantage on reconviction[12] were mediated by the frequency of visitation. According to this method, four criteria must be met to establish a mediating effect: 1) the independent variable is correlated with the dependent variable, 2) the independent variable is correlated with the mediating variable, 3) the mediating variable is correlated with the dependent variable, and 4) the correlation between the independent and dependent variables is reduced when the mediating variable is included in the model. Therefore, we began by examining the effects of the independent variables (distance and disadvantage) before and after the mediator (visitation) was added to the model. Table 4 presents the effects of distance and disadvantage on reconviction. [13] The first column displays the total effects of distance and disadvantage and the

Table 4: Effects on Reconviction Before and After Controlling for Visitation

	Model 1: Visitation omitted	Model 2: Visitation included
Visitor Distance		
Average distance	0.89 (0.04)*	0.88 (0.05)*
Shortest distance	1.02 (0.03)	1.00 (0.03)
Highest distance	0.89 (0.04)**	0.88 (0.04)**
Proportion far	0.85 (0.06)*	0.83 (0.06)**
Proportion always far	0.88 (0.05)*	0.86 (0.05)**
Any always far	0.86 (0.04)**	0.85 (0.04)**
All always far	0.96 (0.06)	0.93 (0.05)
Visitor Neighborhood Disadvantage		
Average neighborhood disadvantage	0.97 (0.04)	0.96 (0.04)
Proportion in disadvantaged neighborhood	0.98 (0.06)	0.98 (0.06)
Any in disadvantaged neighborhood	0.93 (0.06)	0.95 (0.07)
All in disadvantaged neighborhood	1.04 (0.05)	1.02 (0.04)

Results are based on Cox regression models. Models include all control variables.

Hazard ratios are presented with robust standard errors in parentheses. ***p < .001, **p < .01, *p < .05

[12] Mediation was also examined using alternative measures of recidivism: rearrest for a new offense, reincarceration for a new felony offense, and supervised release revocation. The results were similar to those presented here.

[13] Table 4 shows the effects of visitor distance when disadvantage was measured as the average of all visitors' neighborhood disadvantage scores. The table also shows the effects for visitor neighborhood disadvantage when distance was measured as the average distance between facilities and distance (the effects of neighborhood disadvantage did not vary substantially when different measures of distance were used). All full models are available upon request.

second column shows the effect after frequency of visitation was added. The effects of visitor distance were not substantially reduced when adding visitation frequency, indicating that visitation did not mediate the relationship between distance and reconviction. Similarly, because visitor neighborhood disadvantage was not related to reconviction in either model, mediating effects were not observed.

Supplemental Analyses

Supplemental analyses were conducted to test these relationships using alternative measures of recidivism: rearrest for a new offense, reincarceration for a new offense, and revocation of supervised release for a technical violation. The results of these analyses are summarized in Table 5. The results for felony reconvictions were similar to the results for reconviction for any new offense; however, the proportion of observations in which visitors were far from facilities was not related to felony reconviction, as it was to reconviction for any new offense.

None of the distance variables were related to reincarceration. The results for rearrest and revocation were similar to those presented above for reconviction, with some indicators of distance showing a negative relationship with rearrest and reincarceration. However, the extent to which different measures of distance were associated with recidivism varied across type of recidivism. Rearrest was significantly related to two of the seven distance measures: the average distance and the highest distance between offenders and their visitors. Revocation was related to four of the distance variables: the average distance and highest distance between offenders and their visitors, the proportion of visitors who were always more than 60 miles from the offender, and the indicator that any of the offender's visitors were always more than 60 miles away.

Table 5: Summary of Findings for Alternative Measures of Recidivism

	Any Reconviction	Felony Reconviction	Rearrest	Reincarceration	Revocation
Visitor Distance					
Average distance	.88 (.05)*	.87 (.05)*	.91 (.04)*	.95 (.07)	.90 (.03)*
Shortest distance	1.00 (.03)	1.01 (.02)	.98 (.04)	1.02 (.03)	.96 (.02)
Highest distance	.88 (.04)*	.87 (.05)*	.92 (.03)*	.96 (.06)	.90 (.03)*
Proportion far	.83 (.06)*	.82 (.09)	.85 (.08)	.87 (.13)	.86 (.07)
Proportion always far	.86 (.05)*	.86 (.05)*	.87 (.08)	.94 (.11)	.84 (.05)*
Any always far	.85 (.04)*	.83 (.07)*	.88 (.07)	.96 (.11)	.82 (.06)*
All always far	.93 (.05)	.95 (.04)	.91 (.10)	.94 (.10)	.90 (.05)
Visitor Neighborhood Disadvantage					
Average disadvantage	.96 (.38)	.98 (.04)	1.00 (.02)	1.04 (.04)	1.04 (.03)
Proportion in disadvantaged neighborhoods	.99 (.06)	1.03 (.09)	.98 (.06)	1.08 (.10)	1.16 (.06)*
Any in disadvantaged neighborhoods	.96 (.07)	1.02 (.09)	.98 (.07)	1.09 (.11)	1.09 (.08)
All in disadvantaged neighborhoods	1.02 (.04)	1.05 (.07)	.94 (.04)	1.01 (.05)	1.12 (.05)*

Hazard ratios are presented with robust standard errors in parentheses. *$p < .05$

As with the results presented for reconviction, the four measures of visitor neighborhood disadvantage were not related to risk of rearrest or reincarceration. However, two of these variables were related to revocation: the proportion of visitors living in disadvantaged neighborhoods and the indicator that all of an offender's visitors lived in disadvantaged neighborhoods. Offenders whose visitors lived in more disadvantaged neighborhoods were 13-19% more likely to return to prison due to revocation of supervised release.[14]

Discussion

Inmate visitation has been promoted in the reentry literature as a way to increase social support upon release from prison. Previous literature shows that visits from family, friends, and volunteers are beneficial for offenders – particularly in reducing recidivism (Bales & Mears, 2008; Cochran, 2014; Duwe & Clark, 2013; Mears et al., 2012; Mitchell et al., 2016) – and that distance from visitors affects how many visits prisoners receive (Casey-Acevedo & Bakken, 2002; Clark & Duwe, 2017; Cochran et al., 2016; Schirmer et al., 2009; Tewksbury & DeMichele, 2005). This study is the first to examine whether the distance between inmates' facilities and their visitors influences recidivism. Among offenders who received visits, reoffending became less likely as visitors' distance from the facilities where offenders were housed increased. This relationship was not explained by the effect of spatial distance on the frequency of visitation.

While the current study cannot fully explain this relationship, the possible interpretations speak to criminological theories that emphasize the importance of prison visitation. First, visits from distant loved ones may be especially protective: in line with social bond theory, offenders'

[14] Supplemental analyses (available upon request) were conducted using different measures of visitor neighborhood disadvantage. In these supplemental analyses, the variables were created defining "disadvantaged" as greater than or equal to one standard deviation above the mean. Visitor neighborhood disadvantage was not significantly related to any of the recidivism outcomes when it was measured this way.

knowledge that visitors travel a long distance might strengthen the bonds between them and their visitors, reducing risk of recidivism. Additionally, this relationship may not be causal in nature but may instead reveal important aspects of visitor-offender relationships. Visitors who are willing and able to travel long distances may have greater access to resources that can help offenders after release. They may also be more likely to use those resources in this way, providing offenders with greater assistance toward successful reentry into the community. [15]

We also extended the literature on ecological effects on recidivism by examining whether the context of visitors' neighborhoods was related to recidivism. While prior research suggests that disadvantage within offenders' residential neighborhoods increases recidivism (Kubrin & Stewart, 2008; Hipp et al., 2010; Clark, 2016; McNeeley, 2018a, 2018b), it is unknown whether other areas that may be important to the offender – such as neighborhoods where their visitors live – have a similar effect. Contrary to expectations, none of the four measurements of visitor neighborhood disadvantage were significantly related to reconviction, rearrest, or reincarceration. However, two of the four disadvantage measures were associated with higher risk of supervised release revocation. Visitors from disadvantaged neighborhoods likely have fewer resources available to help offenders meet the conditions of their supervised release, such as by providing transportation or housing or helping them secure employment.

Another possible explanation for the relationship between visitor neighborhood disadvantage and revocation is that offenders may spend time with their visitors in these areas, and this context may influence behavior that increases the likelihood of revocation, such as drug

[15] In addition, some research suggests offenders placed farther away from their homes experience greater deterrence (Bedard & Helland, 2004; Drago, Galbiarti, & Vertova, 2011) by instilling stronger feelings of isolation from one's social network and one's home community, which may encourage released offenders to desist from crime in order to avoid returning to prison. However, since it is unknown whether distance has similar effects on offenders who do not receive visits, this particular theory cannot be supported without additional information. Therefore, the results should not be interpreted as suggestive that offenders will be less likely to recidivate if they are placed at remote facilities.

use. Alternatively, spending time in disadvantaged communities may increase the likelihood of revocation because of different law enforcement practices in these areas (Mears, Stewart, Warren, & Simons, 2017). However, this study cannot verify whether offenders actually spent time in these neighborhoods. Future research should explore how offenders' movements into their broader environments influence recidivism or reentry success.

These findings provide implications for correctional practices designed to reduce recidivism. First, given the negative relationship between visitation and recidivism observed here and in prior research (Bales & Mears, 2008; Cochran, 2014; Duwe & Clark, 2013; Mears et al., 2012; Mitchell et al., 2016), prison visits should be encouraged. Since visits from distant visitors are less likely (Cochran et al., 2016; Clark & Duwe, 2017) and, as argued here, could be particularly protective, programs that help community members travel to state prisons for visitation could be beneficial. Second, given the results regarding disadvantage and revocation, it may be beneficial for supervision agents to consider whether released offenders spend time in criminogenic areas, beyond simply focusing on the context of the neighborhoods in which they reside. In addition, supervision agents should be aware of the challenges that offenders face when their social networks are comprised of individuals with few resources, such as those who live in disadvantaged communities. Visitor neighborhood context could serve as an early sign that an offender may experience difficulty with reentry. At the same time, greater distances traveled by visitors could be an early sign that an offender has a strong social network to help with the reentry process, although shorter distances should not be considered a sign of weak social networks.

Although this study provides insights into the relationship between visitation and recidivism, there are limitations that must be acknowledged. First, because most offenders were

transferred to different facilities over the course of their incarceration, we could not fully account for facility-specific effects. The facilities farthest away from the Twin Cities metropolitan area have lower security classification; however, we controlled for relevant characteristics such as institutional misconduct, individual risk level as measured by the LSI-R, and offense type. In addition, we controlled for circumstances that could account for differences in recidivism among the more remotely-located facilities – most notably, participation in treatment programs. Second, we were not able to examine differences in visitor type. Because inmates' visitation experiences vary by visitor type (Turanovic & Tasca, 2017), the effect of visitors' distance from facilities on recidivism may not be uniform across visitor type. For example, distance traveled by spouses or other family members may be more important than that of volunteers, as volunteers likely have less contact with offenders after release.

Third, we were not able to account for the timing of visits; therefore, it is unknown whether the relationship between distance and recidivism changes when visitation increases or declines at later points in offenders' sentences. Fourth, it is important to note that, because the data were collected using offenders' official visitor lists, this study may not include all important members of an offender's social network. Other family members or friends may not have signed up for visitation because they were unable to visit for various reasons, one of which could be distance. Therefore, the results must be viewed with some caution. Finally, visitation is assumed to be a way to reduce associations with criminogenic peers by increasing pro-social support; however, we were unable to measure peer influence in this study. Future research should consider how prison visitation affects association with anti-social peers after release.

Future research should incorporate how distance or recidivism may be related to video visitation – which, like in-person visitation, may allow offenders to maintain their social ties in

the community. Importantly, it is possible that other types of communication replace visits for those who live far from correctional facilities. In fact, offenders who have more distant visitors could receive *more* communication than some offenders with visitors who live nearby: Distant visitors may video frequently to make up for their inability to visit in person, while those who live nearby may visit on occasion but neglect other types of communication. Future research should incorporate video visitation, in particular, in order to more fully understand ways to help offenders maintain ties that assist in re-entering the community.

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