REVISITING THE NEIGHBORHOOD: A SPATIAL ANALYSIS OF COMMUNITY ORGANIZATIONS AND JUVENILE RECIDIVISM IN THE URBAN SOUTHWEST

by

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DEDICATION

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ABSTRACT

It is well documented that characteristics of residential neighborhoods shape the lives of residents in ways that can perpetuate or alleviate inequality. One compelling but comparably understudied explanation for these “neighborhood effects” is that organizations in the neighborhood shape the opportunities and constraints residents face. A small body of work has examined neighborhood contributors to adult repeat offending and scholars have called for more work on the role of organizations in offender recidivism. Surprisingly, no prior research has examined whether spatial proximity to community organizations influences the likelihood that juvenile offenders will repeat offend despite theories of juvenile delinquency that suggest local institutions generate social and formal control that, in turn, may influence delinquent behavior.

To fill this gap, I examined seven types of organizations theorized to influence recidivism serving as *risk enhancers* or *risk reducers* in a juvenile’s neighborhood. I conducted tract-level and individual-level analysis in the Phoenix-urbanized area using point-level geolocated data on organizations and juvenile offenders who completed diversion or probation supervision with Maricopa County Juvenile Probation in 2007. Spatial regression models indicated there were more organizations per capita in census tracts with higher socioeconomic disadvantage across the metropolitan area, rather than a negative association as predicted. However, descriptive maps indicated a spatial mismatch between juvenile offenders and resources; reentering youthful offenders were largely located in areas lacking socioeconomic and organizational resources in select suburbs and communities just outside the urban core.

Using Cox proportional hazard models, I also examined the influence of aggregate neighborhood disadvantage and the number of organizations accessible within walking distance of a juvenile's approximate residential address on their likelihood of subsequent recidivism, net of individual characteristics. My results were mixed and modest and did not provide strong support for the general predictions of social disorganization theory. Rather than exerting uniform *risk enhancing* or *risk reducing* effects, the influence of nearby organizations on repeat offending varied by juvenile population and type of recidivism (any, status/public peace, property, violent/drug). Neighborhood disadvantage enhanced the risk of a new property offending but was unrelated to other types of repeat offending. However, this relationship was largely accounted for by proximity to the total number of organizations lending support to a routine activities approach for property offense behavior.

Findings indicated that public parks, middle and high schools, libraries and community centers, civic/membership/voluntary establishments, and detention/police facilities influenced recidivism risk for status/public peace and violent/drug infractions, but the direction and significance of these effects varied by juvenile population. Together, this research suggests organizations are not inconsequential, but there is no one-size-fits-all approach. Successful integration of organizational measures into neighborhood effects research warrants greater specificity in the types of organizations, resident population, and specific behaviors or outcomes modeled.

CHAPTER 1: INTRODUCTION

Sociologists and criminologists have long recognized that neighborhoods influence individual behavior and outcomes. A large literature links community-level economic disadvantage and residential instability to health, children's well-being and achievement, civic participation, and crime (Browning and Cagney 2003; Leventhal and Brooks-Gunn 2000; Sampson 2013; Sampson, Morenoff, and Gannon-Rowley 2002; Sampson, Raudenbush, and Earls 1997). Although there is a prolific body of publications on "neighborhood effects," much of this work relies on aggregate compositional measures such as socioeconomic disadvantage, racial/ethnic composition, and residential mobility informed by Shaw and McKay's social disorganization theory (1942). A gap remains in understanding *why* neighborhoods matter using more precise measures of what occurs in the local environment, such as organizations and institutions (Allard and Small 2013; Clifford 2018). Further, there is increasing emphasis for more studies that differentiate neighborhood effects by population and behavior. Sharkey and Faber (2014: 559) argued the most promising direction for neighborhood scholars is research that answers "where, when, why, and for whom do residential contexts matter?"

The goal of this dissertation is to address this specific gap in the neighborhood effects literature by exploring the relationship between juvenile repeat offending, or recidivism, and the organizations in a youthful offenders' local community. To accomplish this task, this dissertation contains three empirical chapters that use a unique, geolocated dataset on the greater Phoenix metropolitan area to investigate the relationship between neighborhood disadvantage, community organizations and reentering juvenile offenders at risk to reoffend. I differentiate by juvenile population, types of new

offenses, and the types of organizations because I expect there is not a "one-size-fits-all" approach. Instead, current sociological and criminological research on neighborhoods, organizations, urban studies, and juvenile delinquency suggests that organizations may inhibit or enhance repeat offending differently based on the type of behavior and history of juvenile offender.

Theories of juvenile delinquency suggest that organizations may serve as risk enhancers or risk reducers to the extent that they provide social or formal control inhibiting repeat offending (e.g., community centers) or draw together motivated offenders without adequate supervision (e.g., public parks). While criminogenic facilities have received some attention in prior empirical work, less is known about the spatial influence of protective organizations on individual repeat offending. Further, a systematic typology of organizations and their theorized effects on juvenile repeat offending has not been formalized elsewhere. My main contribution to the literature is to bring an organizational dimension to the study of youth recidivism and in doing so, shed light on a larger conversation about the hazards and benefits of where we live.

In Chapter 2, I trace the historical lineage of neighborhood effects research from its roots in the Chicago School and social disorganization theory to the present. The present focus in neighborhood effects research embraces the idea that organizations should be addressed. I review empirical findings on the relationship between organizations and adult parolee reentry, and the limited work on juvenile offender reentry that considers the neighborhood in conjunction with individual-level attributes. I close the chapter by offering a typology of organizations that I predict will exert formal or

social control on offenders through distal or proximal effects, based on the tenets of routine activities, differential association, and social control theories of juvenile crime.

In Chapter 3, I describe the specific empirical focus of the three analyses, as well as the detailed procedures used to collect, code, and analyze the data. In Chapter 4, I present the results of empirical analyses that examine metropolitan-level patterns of socioeconomic disadvantage, the density of community organizations, and the distribution of juvenile offenders at the tract-level. Using descriptive maps and spatially weighted regressions, I examine where offenders live in relation to valued organizations to determine if spatial inequality exists across the urban landscape. Chapters 5 and 6 chapter take an individual-level approach to examine the individual risk of recidivism for specific types of new offenses offenders released from diversion and probation supervision, accounting for offender characteristics and community context. Based on the predictions of social disorganization theory, Chapter 5 examines the influence of aggregate neighborhood disadvantage on offender recidivism by type of offense using Cox proportional hazard models. The analyses in Chapter 6 incorporate organizational measures using the establishments that are within walking distance from each juvenile offenders' home to test whether having risk enhancing or risk reducing organizations nearby influences individual risk of repeat offending. Finally, I close with a concluding chapter to place the empirical findings from this work in the larger dialogue about neighborhood effects literature, as well as to offer recommendations for additional research to extend the findings reported here.

CHAPTER 2: LITERATURE REVIEW

Historical Perspectives on Neighborhood Effects

The idea that the characteristics of urban neighborhoods influence those who live there is one of great enduring contributions of early sociological researchers. Indeed, early scholarship on the link between neighborhoods and individual behavior focused almost exclusively on crime and sought to identify spatial hotspots of criminal activity. The earliest mapping of crime is traced to Guerry (1833) who produced maps of France showing spatial hotspots of criminal activity. However, it was the work of sociologists at the University of Chicago in the early 20th century, known later as the "Chicago School" that brought neighborhood-based analysis to the fore. They explored geographic patterns of urban crime and vice that arose with rapid industrialization and urbanization (Park 1915; Park and Burgess 1925). One of the best-known contributions of this time was a pictorial representation of growth patterns of the city based on concentric zones with the industrial center at the core. The zone of transition, nearest to the urban center, with slum dwellings housing industrial workers near to the city center, was an area of enduring high crime (Park and Burgess 1925). The nature of work and life in these slum areas was characterized by a highly mobile, impoverished residential population without the social or organizational infrastructure to sustain social order. Louis Wirth (1938) argued in his influential paper "Urbanism as a Way of Life," that this was a function of urban life in general, which fundamentally changed how people related to one another. Crime in the city persisted because the strong, overlapping social bonds of rural life that held people in check were replaced with fleeting, instrumental ties as a function of city living. Yet, a critical part of the argument was that the ill effects of urban life were not borne equally,

but rather there was spatial patterning in crime. Areas in the city with fewer ties that bind, such as areas with highly transient populations, would lack the necessary social control to inhibit problem behavior.

Social Disorganization Theory

The idea that the social structure of relations in a neighborhood could influence individual behavior, a mainstay of contemporary sociological thinking, was further elaborated in Shaw and McKay's (1942) social disorganization theory. They focused on explaining why juvenile crime rates were higher in some areas of Chicago than others. Delinquency hot spots remained remarkably stable over a 30-year period, even when the ethnic composition of the areas changed. Shaw and McKay offered social disorganization theory to explain persistently high levels of youth criminality in some areas. Simply, some neighborhoods have greater resources (tangible and intangible) that allow residents within these communities to impose social control on residents (through both formal and informal means). A socially disorganized neighborhood, in contrast, is characterized by an inability to "realize the common values of its residents and maintain effective social controls" (Sampson 2013: 37). Shaw and McKay (1942) theorized that communities characterized by high concentrations of ethnic heterogeneity, economic disadvantage, and a highly mobile residential population would have greater delinquency because the neighborhood conditions reduce the levels of collective trust and interaction they viewed as necessary for community-level social control. At the time, this theory of delinquency marked a pivotal shift in the criminological literature because it considered environmental context as a component of delinquent behavior.

Despite the initial popularity of this approach, social disorganization theory was heavily criticized in the 1950's and 1960's. Certainly, many of the criticisms were well-founded such as the problem of ecological fallacy, when individual-level inferences are draw from aggregate data, as well as concern with how to operationalize "social disorganization" without tautological definitions (Bursik 1988; Kubrin and Weitzer 2003). Ethnographers also raised valid concerns with normative assumptions in the social disorganization perspective that failed to acknowledge not everyone within a neighborhood shares the same values and goals. Furthermore, some scholars noted that violence or crime are not necessarily indicative of a lack of community efficacy or control. For example, ethnographic research has shown that ethnic gangs can flourish in tightly knit communities because their presence is part of the fabric of neighborhood life (Sánchez-Jankowski 1991; 2008; Whyte 1943). Although many criminologists abandoned ecological models in favor of individual-level contributors to crime, Shaw and McKay's work has endured in urban scholarship generally.

Wilson's Theory of Spatially Concentrated Urban Poverty

A contemporary revival of neighborhood-based research can be attributed in large part to the work of William Julius Wilson on the causes and consequences of urban poverty in inner-city neighborhoods of Chicago (1987; 1996). Wilson's seminal work documented the plight of black residents living in extremely impoverished areas of Chicago. In his book *The Truly Disadvantaged,* Wilson (1987) observed that extreme poverty was geographically concentrated. These areas of "concentrated poverty" had more than 40% of households living below the federal poverty line and had a high proportion of black residents. This spatial concentration of an urban underclass, Wilson

argued, could be traced to both demographic changes such as an increase in female-headed households, and structural changes in employment and organizations that transformed neighborhoods into ghettos. Fierce global competition led to a precipitous decline of manufacturing jobs in the Chicago area. Steel mills closed and moved overseas. Other employers moved to the suburbs along with a suburban workforce flocking to burgeoning middle-class residential communities subsidized by Federal Housing Administration policies. When employers and middle-class residents left these inner-city neighborhoods, community organizations such as banks and churches soon followed. This exodus of residents and institutions left behind a concentration of marginalized, mostly poor black residents, in communities bereft of the organizations necessary for employment and sustaining the social fabric of the neighborhood.

Wilson (1996) further elaborated the effects of living in neighborhoods of concentrated poverty in *When Work Disappears.* He argued that structural changes in opportunity preceded cultural shifts that further exacerbated the problems in neighborhoods of concentrated poverty. Over time, persistent lack of legitimate employment fundamentally altered the values and cultural norms of residents in ways that further perpetuated disadvantage. Wilson's research was primarily concerned with explaining and understanding urban inequality. Nevertheless, his ideas re-focused attention on how neighborhood characteristics influence residents more generally (see Small and Allard 2013; Small and Newman 2001). Moreover, he specifically noted the presence or absence of organizations within a neighborhood as a key component of urban spatial inequality.

Empirical research on "neighborhood effects" exploded in the decades following Wilson. A tremendous volume of work has associated neighborhood context with inequality (Allard and Small 2013; Bursick 1988; Clifford 2018; Sampson and Groves 1989; Sampson et al. 2002). This work has largely taken a compositional approach to characterize neighborhoods using socioeconomic and demographic measures of the residents who live in the neighborhoods (e.g., percent in poverty, percent black). For example, neighborhood disadvantage has been linked to health, children's well-being (Leventhal and Brooks-Gunn 2000), youth physical aggression (Chang, Wang, and Tsai 2016), civic participation (Putnam 2000), and crime and delinquency (Browning and Cagney 2003; Huang, Ryan, and Rhoden 2016; Sampson et al. 1997; 1999; Sampson 2013).

However, many scholars have expressed growing dissatisfaction what has been called a "black box" approach to neighborhood influence. Many publications failed to contribute meaningfully to the conversation about the intermediary mechanisms linking neighborhood disadvantage to individual inequality (see critiques by Jencks and Mayer 1989; Sampson et al. 2002; Kubrin and Weitzer 2003). A remaining gap in neighborhood effects research is understanding *why* neighborhoods lead to differential outcomes for individuals. The goal is to identify specific mechanisms that underlie this enduring association (Small and Newman 2001; Sampson 2012).

Formal Organizations as the "Missing Link"

One specific research priority articulated by leading urban scholars is work that considers emergent properties of neighborhoods, such as systems, organizations, and institutions, not captured in aggregate census data (Allard and Small 2013; Bursick 1988;

Sánchez-Jankowski 2008). The idea that organizations are important in shaping life outcomes is not new (Jencks and Mayer 1990; Leventhal and Brooks-Gunn 2000; Sampson et al. 2002). Qualitative scholars have noted the role of neighborhood organizations in providing both tangible and intangible resources for residents. For example, Sánchez-Jankowski (2008) observed that many "Mom-and Pop" grocery stores in poor neighborhoods preserved and honored cultural heritage through food and provided a space for social interaction and identity formation that elevated these stores to neighborhood institutions.

Nevertheless, more empirical research on how organizations structure life for urban residents, particularly youth, is needed (Allard and Small 2013). McQuarrie and Marwell (2009) lamented the "missing organizational dimension" in urban sociology because as they see it formal organizations have "an independent role in the production, reproduction, and arrangement of urban social relations, neighborhood conditions, and individual outcomes and identities (p. 247). While there is increasing work in recent years that considers organizations as a component of neighborhood, there is considerably more work to be done to fully understand the role organizations may play in urban inequality (Allard and Small 2013).

Organizational Impact on Residents

There are two general arguments about why nearby organizations can influence resident behavior or outcomes directly and indirectly. A useful definition of organizations comes from Allard and Small (2013), which I also adopt here because it because it excludes informal organizations and narrows the scope to organizations with a specific purpose and geographic presence in a neighborhood.

> We define *organizations* as formally recognized sets of peoples and practices whose activities are oriented toward an overarching purpose […]. Organizations typically operate in buildings, file tax forms, receive coding regulations, employ people, and sell or provide goods to patrons or clients. They may be for- or not-for-profit and privately or publicly funded." (pp. 3-4).

According to this definition, some organizations provide direct access to goods, services, information, or social connections that are valuable to the individual. As Freeman and Audia (2006) write, "Opportunities are granted or withheld from social actors depending in part on their organizational connections" (p. 145). Accessibility research based on spatial proximity has largely been the domain of geographers and public health experts (Kwan 2013). The idea is that spatial proximity facilitates the use of valued resources necessary for personal health and well-being, employment, or social integration (Guagliardo 2004). For example, physical proximity to grocery stores (or lack thereof) has been associated with health outcomes like obesity (Moore et al. 2008; Morland et al. 2002). Research on individual usage of nearby facilities has shown a link between service use and geographic proximity for substance abuse and mental health services (Lockwood 2012), children's activities (Galaskiewicz, Inouye, and Savage 2008), parks (Cohen et al. 2007), recreation facilities (Kaczynski and Henderson 2008) and doctor's offices (Anderson 2016; Billi, Chih-Wen, and Spahlinger 2007).

A second way that formal organizations are theorized to influence residents is at the neighborhood-level. The idea is that certain types of organizations generate ties between individuals which, in turn, benefit the entire neighborhood because they enhance collective social control (Coleman 1988; Sampson et al. 1997). Sampson and colleagues

(1997) called this phenomenon "collective efficacy." Following the tenets of social disorganization theory, as trust between neighbors increases, so does the likelihood that residents can and will intervene to collectively solve social problems like juvenile delinquency (Sampson 2013). Organizations are one vehicle for generating these social ties. Oldenburg argued (1989) that "third places" other than home and work, such as the local coffee shop or community centers, are essential to the vitality of a community. Similarly, Putnam (2000) lamented the decline of voluntary club participation and bowling leagues as a sign of the demise of civic and civil society.

At the macro-level, organizations can also link neighborhood residents to valued external resources (Galaskiewicz 1979). A study in Brooklyn found that community-based organizations (CBOs) with links to institutions outside the local neighborhood were instrumental in obtaining housing, employment and social service opportunities for residents by bringing external resources into the neighborhood (Marwell 2007). Organizations without explicit advocacy missions, such as childcare centers, have also been shown to increase residents' access to resources beyond the local neighborhood (Small, Jacobs, and Peeples Massingill 2008; Marwell and Gullickson 2013).

But not all organizations are desirable in a community. Specificity in the type of organization is necessary to understand the relative risk or rewards of adjacency. The mental and physical health hazards for residents who live near organizations that create noise, water, air pollution and hazardous waste are well documented, and are differentially borne by underprivileged populations (Crowder and Downey 2010; Downey 2005, Downey and Van Willigen 2005; Evans and Kantrowitz 2002). Some organizations, such as liquor stores, bars, or marijuana dispensaries, can generate

undesirable traffic, and increase crime and noise disturbances (Day et al. 2012; Grubesic and Pridemore 2011). Further, strong interpersonal networks between residents can facilitate rather than inhibit illicit activities (Browning, Feinberg, and Dietz 2004; Kubrin and Weitzer 2003; Portes 1998). Together, this literature suggests that organizations matter, but further specification is necessary to account for the heterogeneity in the influence of organizations based on the resources or hazards they bring to a neighborhood.

Spatial Capital

It is important to note that the relationship between organizations and resident behaviors is multifaceted. The term spatial capital introduced by Marcus (2010) refers to the ability of actors to capitalize on spatial resources to realize individual value. Spatial capital is the result of one's location to valued resources as well as the ability to access resources (such as transportation capabilities or access to information such as GPS), and individual credentials to enter different areas based on socially significant statuses (Galaskiewicz et al. 2016).

While disparities in the resources available in one's residential neighborhood can have real costs, geography is not deterministic. Physical proximity to an establishment is only one component of accessibility (Guagliardo 2004). As Abramson (2015) observed in his study of aging adults, "both *neighborhood contexts* and *material resources* (e.g., money, health, insurance, and property) create a drastically uneven field on which the end game is played," (p. 42). Having a senior center or health care services nearby was only one component of access. Residents with poor physical mobility and reliable transportation services faces significant logistical challenges, even if they were relatively

close to the facilities. Conversely, adding a new grocery store to a resource-depleted neighborhood alone is insufficient to combat obesity (Cummins, Flint, and Matthews 2014). Thus, spatial proximity models, while important, can only address one aspect of the accessibility challenges individuals in poor neighborhoods may face.

Theories of Juvenile Delinquency

The idea that neighborhood organizations can influence juvenile delinquency finds support in three theories of juvenile delinquency. Social control theory, routine activities, and differential association theory have been used to conceptualize why offenders start and stop criminal behavior (Laub and Sampson 2003). The role of formal organizations in offender behavior is not explicitly emphasized in these perspectives. However, the theoretical logic of these theories predicts that differential access to services, interaction, or exposure that can inhibit or enhance risks for juvenile offenders which could be observable in a spatial analysis of organizational resources.

Routine Activities

The routine activities perspective is based on a rational actor model and considers the *external constraints* in the routine activities of daily life that keep potential offenders from breaking the law. In the original formulation, Cohen and Felson (1979) argued crime rates in the United States could be explained by the overlap in time and space between motivated offenders, available targets for crime, and the absence of supervisory guardians. They argued increases in predatory crime could be tied to transformations of the labor market, such as the mass influx of women into the paid workforce, which reduced supervision of adolescents (e.g., latch-key kids) and private property. This perspective considered the spatial, temporal, and situational dimensions of youth crime.

The logic of routine activities has been invoked to explain hotspots of criminal activity (Sherman, Gartin, and Buerger 1989) as well as the correlation between unstructured socializing without parental supervision and juvenile delinquency (Maimon and Browning 2010; Osgood et al. 1996; Osgood and Anderson 2004).

The underlying logic can be extrapolated to organizations. A direct application of routine activities approach is that more community organizations such as recreation clubs or sports/membership clubs that directly reduce the time youth offenders spend unsupervised, should decrease youth crime. Conversely, organizations that bring together motivated offenders and victims without adequate regulatory supervision may increase criminal activity. Brantingham and Brantingham (1995) proposed two types of criminogenic land use patterns including *crime generators,* that draw together large groups of people, both offenders and victims (e.g., shopping center) and *crime attractors,* places that attract strongly motivated offenders because of the plentiful opportunities for illicit activites (e.g., red light districts).

An extension of the routine activities approach has been offered by Browning and Soller (2014) which marries network analysis with the concept of *collective efficacy*. They use the term eco-networks to describe the geographic and temporal space of one's daily routine attending school, work, and social events. Collective benefits arise when these eco-networks overlap such as increased trust between neighbors and supervision over public spaces which should reduce subsequent criminal activity (Browning et al. 2017a; Browning et al. 2017b). This idea is conceptually similar to *collective efficacy* (Sampson 2013); the main extension is methodological. The key implication for an organizational perspective on juvenile recidivism is that organizations may enhance or

reduce the *external constraints* on individual offenders depending upon how they structure the interactions between motivated offenders, potential victims, and supervisory agents.

Differential Association Theory

Differential association theory, in contrast, focuses on the *internal motivations* for crime as learned from others. The basic argument is that juvenile delinquency is the result of exposure to delinquent peers and family members (Sutherland 1947). Juveniles acquire both the techniques to commit crimes as well as values and norms that rationalize the behavior. Thus, youth who have greater exposure to attitudes that legitimize criminal behavior over conformity are more likely to adopt these principles (Burgess and Akers 1966). Thus, having more organizations accessible that facilitate relationships with adults and other youth who value compliance with the law may inhibit repeat delinquency.

There is strong empirical evidence that finds delinquent peer exposure increases an individuals' own participation in delinquent activities (Cottle, Lee, and Heilbrun 2001; Mulder et al. 2011) and this relationship is amplified in dense networks (Haynie 2001; Pyrootz, Sweeten, and Piquero 2013). This is one reason diversion programs exist; rather than detaining first time offenders in juvenile detention facilities, which can increase their exposure to delinquent peers, youth with minor infractions receive consequences outside the formal justice system such as appearing before a community justice board (Wilson and Hoge 2013). Other research has shown that a change or disruption in delinquent peer networks can reduce delinquency. Sweeten et al. (2013) found that changing the social network of youth offenders and increasing structured activities reduced delinquency and

gang involvement. Thus, organizations that disrupt delinquent peer networks or enhance the development of conventional activities and values could influence initial and repeat offending. However, other research has found the same types of neighborhood-level properties such as trust and solidarity between residents and low neighborhood disadvantage increase opportunities for unstructured, unsupervised socializing and violent behavior (Maimon and Browning 2010). Similarly, youth are more likely to offend with other juveniles in neighborhoods where collective levels of trust are high, and disadvantage is low (Shaefer, Rodriguez, and Decker 2014).

Social Control Theory

Social control theory brings together the idea that both *internal and external processes* explain delinquency. The fundamental premise of Hirschi's social control (1969) theory is that delinquency is the result of a weak bond to society. A strong social bond, according to Hirschi, develops through attachment to others, commitment to and involvement in conventional activities, and belief in the legitimacy of the law and legal systems. Moreover, the processes that inhibit delinquent behavior include both internal and external dimensions. Youth who have internalized conventional values, norms or individual goals have a self-regulating mechanism that makes the risks of delinquent behavior and possible punishment less attractive than conventional behavior. External sources of social control such as adult supervision and relationships with non-delinquent peers can also keep delinquent youth out of trouble. The import for this study is that some types of organizations can reduce crime by offering services that enhance commitment to and involvement in conventional activities to increase the social bonds tethering former offenders to society. For example, social service agencies can enhance

individual capacities for conventional attachments (e.g., employment, drug treatment) while other establishments provide opportunities for community engagement that can enhance the social bond (e.g., voluntary, civic, social, and fraternal).

One of the most compelling recent works on juvenile delinquency using a social control approach comes from *Shared Beginnings, Divergent Lives: Delinquent Boys to Age 70* (Laub and Sampson 2003) which expanded ideas first developed in their earlier book *Crime in the Making* (Sampson and Laub 1993). The authors followed up with a sample of youthful offenders who had been part of Sheldon and Eleanor Glueck's 1950's study when the men were in late adulthood (60+). Their objective was to explain variation in offending patterns over the life course. In the lives of the men they studied, Laub and Sampson (2003) identified "turning points" such as marriage, military service, or steady employment that anchored former delinquents to society. These turning points, such as gaining steady employment, modified the men's daily routines, peer interactions, and offender identity and beliefs that strengthened the social bond, ultimately leading to desistance from crime. From these findings, Laub and Sampson (2003) concluded that three general processes explain persistence or desistance in crime: 1) the presence or absence of informal and formal social controls, 2) structured vs. unstructured routine activities, and 3) individual agency. This model pulls together insights from routine activities, differential association theory, and social control theory to explain long-term offending patterns. This logic is also generalizable to the juvenile population to the extent that organizations can influence the degree of social and formal control of juvenile behavior.

Organizations and Crime

Despite the theoretical underpinnings that suggest organizations can influence juvenile offending, the empirical work between organizations and juvenile crime is sparse. Most of the work on organizations has focused on aggregate crime rates (e.g. property and violent offense incidents) and criminogenic facilities rather than examining the influence of nearby organizations in individual offending trajectories (reviewed by Groff and Lookwood 2014). Empirical work has shown that subway stations (Groff and Lockwood 2014), alcohol outlets (Wo 2016), public schools and shopping malls (Kautt and Roncek 2007; LaGrange 1999; Slocum et al. 2013) and public parks (Groff and McCord 2012) function as crime generators when measures of aggregate crime counts, or rates are modeled (Brantingham and Brantingham 1995).

Far fewer studies have examined organizations as protective entities that reduce overall crime. Results from this body of empirical work has been mixed. Multiple studies report a limited or null effect of voluntary organizations on violent and property crime. Studying nine U.S. cities, Wo (2016) found that “third places” such as coffee shops and cafes were associated with less crime, but civic and social organizations had no statistically significant relationship with violent or property crime counts. Similarly, Slocum et al. (2013) found no relationship between voluntary organizations and crime in their study of institutions in South Bronx, NY. Instead, areas with more political or advocacy organization that bridged beyond the local community had less violent crime. This effect was not ubiquitous for property crimes; bridging organizations reduced property crime in areas with more commercial land use but were associated with slightly higher property offenses in predominantly residential areas. Family and youth-service

organizations reduced property crime but not violent crime. Peterson, Krivo, and Harris (2000) observed that recreation centers reduced violent crime in extremely disadvantaged neighborhoods in Columbus, Ohio but did not exert a general protective effect across levels of socio-economic disadvantage.

Other scholars have explored how changes in organizational densities over time influence neighborhood-level recidivism rates among adult offenders. Wallace and Papachristos (2014) found that losses or gains in health care organizations in Chicago impacted recidivism in areas of concentrated disadvantage. Areas with higher levels of concentrated disadvantage saw greater recidivism reduction when three or more health care organizations were added to the neighborhood and saw a greater increase in recidivism when three or more health care organizations were lost. These results suggest economically disadvantaged neighborhoods have the most to gain from the addition of valued organizational resources, and subsequently the most to lose when these organizations dissolved or moved elsewhere. Clifford (2018) observed that more impoverished neighborhoods were doubly disadvantaged in England. Poor neighborhoods were not only less likely to have voluntary associations locate there, but also had a higher rate of voluntary association dissolution.

Another study by Wallace (2015) examined changes in the density of employment and emergency assistance organizations. She found that losses in two or more education organizations (e.g., junior colleges, trade schools) increased the recidivism rate in Chicago neighborhoods. Neighborhood affluence conditioned the effect of changes in emergency assistance and employment organizations, but in opposite directions. When more affluent neighborhoods gained emergency assistance organizations, the recidivism

rate increased which Wallace suggests indicates certain types of organizations may increase exposure to criminogenic populations which leads to increased crime (p. 304). Conversely, gains in employment organizations in more affluent neighborhoods reduced recidivism rates. These findings support the assertion by Slocum and colleagues (2016) that the relationship between the organization infrastructure of a community and crime is "elusive." Taken together, these findings suggest differentiation by type of organization and type of crime is warranted in any study linking organizations and delinquent activity; there is no one-size-fits all approach.

One limitation is that most prior research linking organizations and crime uses crime incidents, crime rates or neighborhood-level recidivism rates as the outcome measure. While this is methodological approach is useful for identifying hotspots of criminal activity across the urban landscape, this type of analytical approach does not shed light on whether individual-level proximity to criminogenic or protective facilities influences individual offending trajectories, a gap which I address here.

Neighborhood Context and Recidivism

There is a small, but important literature that looks at neighborhood predictors of adult reoffending using the individual as the unit of analysis (see a review by Morenoff and Harding 2014; Visher and Travis 2003). Most of these studies used aggregate measures of neighborhood context, such as economic deprivation in the census tract or counties and observed mixed results. One of the first of these studies examined adult parolee recidivism in the Portland, Oregon area (Kubrin and Stewart 2006). They found that offenders returning to more affluent tracts were less likely to be re-arrested within one year than those returning to disadvantaged tracts. Other work has shown a

neighborhood disadvantage effect for certain types of reoffending, but not others. Mears et al. (2008) and Orrick et al. (2011) reported that county-level socioeconomic disadvantage increased individual recidivism for violent crime in Florida, but not for property crimes or drug reconvictions. Other research using aggregate county measures finds little or no effect of economic disadvantage on individual adult recidivism (Tillyer and Vose 2011; Wang et al. 2014).

Far fewer studies have examined the spatial distribution of organizations and adult offender risk of repeat offending. A series of studies by Hipp and colleagues (2009; 2010; 2011) found that nearby organizations influenced recidivism among adult parolees in California. Adult parolees with more social service agencies nearby were less likely to return to prison within one year of release, controlling for individual characteristics. However, this effect was reduced when offenders lived near providers that were taxed by high potential demand. African-American and Latino parolees had more health care and social service providers within a two-mile radius of home than white parolees, but these areas also had higher concentrations of ex-offenders taxing resources (Hipp et al. 2009; 2011). This small body of work suggests spatial proximity to organizations that provide valuable resources should be considered as a potential risk or protective factor when assessing the risks adult offenders face upon reentry.

Neighborhood Context and Juvenile Offender Recidivism

There is also reason to suspect that reentering juvenile offenders would be influenced by the institutional infrastructure of their local community, however, this specific relationship has not been examined empirically. In theory, access to valued organizations can buffer the deleterious effects of neighborhood disadvantage on youth

by providing needed services, reducing social isolation, providing cultural, educational or socialization opportunities and/or fostering stronger ties between residents that increase informal social control (Mulvey et al. 2004). The significant educational, emotional, mental health, and substance use/abuse needs of persistent juvenile offenders are well documented (Altschuler and Brash 2004; Maguin and Loeber 1996; Pyle et al. 2016; Abrams and Synder 2010). Between 65% and 70% of youth in the juvenile justice system suffer from at least one mental health disorder and nearly two-thirds of these youth also have a substance abuse disorder, according to the National Center for Mental Health and Juvenile Justice (Shufelt and Cocozza 2006). Childhood trauma, sexual and physical abuse, and substance abuse are risk factors for delinquency and repeat offending (Chassin et al. 2016; Fox et al. 2016; Sickmund 2016; Stoolmiller and Blechman 2005).

Many scholars and court practitioners agree that youth also need developmental and prosocial activities in addition to social services to prevent recidivism (Anthony et al. 2010; Butts 2008; Green et al. 2016; Korchmaros, Thompson-Dyck, and Haring 2016; Nissen 2011; Steinberg, Chung, and Little 2004). Juvenile reentry support service provision to reduce recidivism has received increasing attention and funding over the past two decades (Chassin et al. 2016 and Nissen 2011). The Second Chance Act passed Congress in April 2008 which authorized nearly 600 grant funded awards to support programs aimed at easing the transition post-release for government and nonprofit agencies serving adult and juvenile offender reentry populations (The Council of State Governments Justice Center), specifically for enhancing substance use counseling, mental health services, and housing services. Thus, easy access to organizations that provide these types of services should theoretically influence successful reentry.

Given these funding and programmatic emphases, it is surprising that the literature on neighborhood context and juvenile reentry is so sparse. Most of the juvenile reentry literature has focused on individual characteristics such as mental health diagnoses or substance use history or offense history to predict future success or failure post-release. Neighborhood predictors of reentry risk have been significantly understudied in relation to juvenile repeat delinquency.

Very few studies have explored neighborhood predictors of youth crime in the U.S. (Grunwald et al. 2010; Mennis et al. 2011) and Canada (Jacob 2006; Law and Quick 2013). Findings from this literature have offered mixed support for the predictions of social disorganization theory based on measures of economic disadvantage, ethnic heterogeneity, and residential mobility. A key theme in this body of work is that the influence of neighborhood context using aggregate measures has been shown to vary by type of offense modeled (Jacob 2006; Grunwald et al. 2010) and characteristics of the juvenile population such as gender (Wright and Rodriguez 2014). Others have measured neighborhood resources using perceptions of adults in the area (Leech 2016) or youth self-reported measures of social supports (Smith, Faulk, and Sizer 2016).

A consistent recommendation from scholarship on juvenile recidivism is that more research using more specific measures of the neighborhood context, such as institutions and peers, are needed to supplant measures of economic disadvantage or ethnic composition, which echoes shifts in the larger neighborhood effects literature. Since juvenile court policies and practices emphasize linking youth to community organizations as part of a comprehensive approach to juvenile recovery (Bullis, Yovanoff and Havel 2004; Greene et al. 2016; Nissen 2011), it is critical to understand whether the

location of these services impacts if youth successfully reintegrate into their communities or end up back in the system.

Introducing a Typology of Organizations

My focus here is to address the remaining organizational "missing link" in research on neighborhood contributors to juvenile recidivism. To my knowledge there is no prior work that establishes whether youth offender recidivism risk, like the adult parolees in prior work (Hipp et al. 2009; 2010; 2011), is influenced by the organizations that are spatially accessible in the local neighborhood. To accomplish this task, I examine juvenile offenders in the greater Phoenix-metropolitan using geolocated neighborhood context and organization data. Below, I introduce a typology of organizations that may influence juvenile recidivism as informed by routine activities, differential association and social control theories of juvenile delinquent behavior. I describe each organization subgroup featured in this study and why these entities are conceptualized as *risk enhancers* or *risk reducers* in relation to juvenile repeat offending. I close this section with a brief outline of the three empirical chapters that follow.

To organize this study, I developed a typology shown in Figure 2-1 with two dimensions to conceptualize the types of organizations I expect to influence juvenile recidivism. Organizations can exert *social control* or *formal control* on juvenile offender behavior via *proximal* or *distal effects.* This typology draws on the work of Anderson (2016) for one dimension, the categorization of organizational influence as proximate or distal. The links to juvenile offender behavior via formal and social control are my own contributions.

In brief, Anderson's (2016) work focuses on the relationship between residential racial segregation and individual health outcomes. She differentiated organizations that influence physical health from those that impact mental/emotional well-being through either a proximal or distal effect. She argued that some organizations, like hospitals or doctor's offices, have a direct bearing on physical health (a proximal effect) while others, such as social services which may influence health more indirectly (a distal effect), such as providing access to Medicaid or food stamps.

Figure 2.1. Typology of Organizations and Hypothesized Effect on Juvenile Recidivism

	Proximal	Distal
Social Control	Community Recreation Centers (-) Libraries (-) Parks (+) Schools (+)	Civic, Voluntary, Membership (-) Religious Organizations (-)
Formal Control	Youth & Family Social Services (-)	Police Stations (-) Juvenile Detention Centers (-)

Likewise, organizations in the community may also have a direct influence on juvenile behavior, specifically when services are utilized directly, while other organizations may provide collective-level properties that exert a distal effect. Some organizations may inhibit delinquency through enhanced supervision, exposure to non-delinquent peers or adults, or engagement in conventional prosocial activities (e.g., YMCA and Boys and Girls Clubs). This type of influence can be viewed as *social control.* Other facilities operate with the specific goal of curbing criminal behavior through formal means (e.g., detention centers or police stations) or changing behaviors

(e.g., substance abuse treatment centers, family counseling, behavioral health services). These latter organizations exert *formal control* which may reduce risk of recidivism. The direction of influence on repeat offending, as noted in parentheses, varies depending upon whether the activities/resources of this organization provides social or formal control. Thus, in this conceptualization schools and parks are viewed as *risk enhancers,* while community recreation centers, libraries, youth/family services, civic/social/fraternal, religious orgs, police stations and juvenile detention centers are viewed as *risk reducers.* Below, I describe each of the organizational categories I have selected in my dataset, why I predict it will have the designated effect, and a general description of the types of facilities I have included in each. My methodology chapter describes the minutiae of data coding in greater detail.

Proximal Social Control

Community Centers/YMCA/Boys and Girls Clubs. I predict that community centers and libraries will be negatively associated with juvenile recidivism, exerting proximal social control on delinquency behavior. *Community centers* provide activities such as physical fitness, educational, prosocial, or community-building services such as gardening, cooperative classes, recreation classes specifically designed to draw community members togethers. This category includes such entities as YMCA's, Boys and Girls Clubs and large community centers that would specifically target youth[1]. In general, the activities of these types of establishments are organized and occur under adult supervision. Community centers encourage conventional activities via engagement

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[1] Community centers serving general populations are included in this category. Senior centers are included in the civic/membership/voluntary category as described in detail in the methodology chapter.

with non-delinquent peers, adult supervision and/or mentorship, individual psycho-social development, and maturity, and or new habits, skills, and values that make continued offending less feasible or less attractive[2]. Thus, I predict that the presence of a community center will be associated with reduced recidivism in a neighborhood.

Recent empirical work has supported the predictions of social control theory relative to juvenile offenders. Intravia and colleagues (2017) found that prosocial bonds mediated the relationship between neighborhood disadvantage and repeat offending among juvenile offenders in Florida. Disadvantage reduced prosocial bonds which amplified recidivism risk. Another study by Zimmerman, Welsh, and Posick (2015) reported a protective effect for neighborhood youth organizations in Chicago. Juveniles with low self-control were more likely to engage in self-reported violence. Having more neighborhood youth organizations such as YMCA, Boys and Girls Clubs, and community centers nearby reduced the influence of low self-control on violence.

Public Libraries. Similarly, I expect that public libraries will also provide proximal social control to reduce recidivism risk. Public libraries offer after-school, summer and evening programs specifically for adolescents including: meaningful employment, educational support, technological access, and mentorship (Jones and Delahanty 2011; Moellman and Tillinger 2004; Walter 2009). The academic deficits of juvenile justice involved youth are well known (Maguin and Loeber 1996; Pyle et al. 2016) and public libraries offer academic resources that can directly benefit juvenile

[2] One could also argue that the presence of a community center may reduce reoffending through distal effects by generating collective efficacy in the community (Mennis et al. 2011; Sampson et al. 1997).

offenders. Similarly, library properties are staffed by paid employees and attract a general patronage that provide authority supervision.

Public Parks. Public parks are often a place where organized, supervised activities occur for youth and families, such as little league baseball games or community barbeques. The empirical literature on crime has considered parks to be criminogenic entities (Groff and McCord 2012; McCord and Houser 2017). The main differentiation between a park and a recreation center is that parks lack consistent authority supervision and regular formal activities, thus they do not have the capacity to exert the same level of social control over offender behavior. Groff and McCord (2012), and others have argued that parks are "contested spaces" that can be used for both desirable and undesirable activities (Brantingham and Brantingham 1995). Groff and McCord (2012) found that crime incidents were clustered in and around Philadelphia parks with some parks being more criminogenic than others. Parks with more formal activity spaces such as playing fields/courts, playgrounds, pools, dog parks, or recreation centers had fewer incidence of violent, property and disorder crime compared to parks with fewer specific use areas. Relatedly, a recent study of youth in Chicago found that youth living in areas with more parks and playgrounds increased the likelihood of substance use compared to youth with fewer accessible parks (Kotlaja, Wright, and Fagan 2018). My category of public parks includes those that are general use public parks, excluding those that are privately maintained by a homeowners' association or specific-use public sports complexes which

are analyzed elsewhere[3]. I expect these entities to enhance risk of recidivism for juvenile offenders.

Schools. In the same way that public parks are contested spaces, schools, particularly non-elementary schools serving middle and high school populations, are viewed in the literature as mixed-use facilities. During school hours and days, schools provide structure and supervision as well as purposeful activities designed to enhance the social bond through academics and extracurricular activities.

However, empirical data suggest that middle and high schools are hotspots of youth victimization and crime because they bring together adolescent offenders and potential victims at the same place and time. Higher incidences of drug-related offenses, interpersonal violence, theft, and vandalism are associated with areas on and adjacent to school properties (Slocum et al. 2013; Groff and Lockwood 2014). Research in San Diego, CA (Roncek and LoBosco 1983), Cincinnati, OH (Roncek and Faggiani 1985) and Canada (LaGrange 1999) indicated that public middle and high schools were crime hotspots in the 1980's and 90's and recent studies continue to observe similar findings (Willits, Broidy, and Denman 2013; Willits, Broidy and Denman 2015; Murray and Swatt 2013). However, this criminogenic effect has not been consistently observed near elementary schools (Murray and Swatt 2013; Willits et al. 2013) suggesting that schools serving older student populations are those most likely to increase delinquency and

[3] My data do not capture the level of facility detail that Groff and McCord analyzed but I can differentiate between large public activity facilities (e.g., baseball complex, soccer complex, public pool) and general use public parks. My 'parks' category includes only general use, public parks. I exclude private parks such as those maintained by a private homeowner's association because these have restricted use, and public activity facilities. Large public activity facilities which do host regular, supervised organized activities, such as a soccer complex, are better equipped to provide the social control to reduce recidivism. I analyze these facilities under the civic, voluntary, social organization category which I predict has a protective effect on recidivism.

recidivism. I predict that middle and high schools will function as risk enhancers in my analyses.

Distal Social Control

Organizations such as schools, parks, libraries, and community recreation centers provide resources that are targeted directly at youth and families, so the proximal effect of social control is rather intuitive. At a more general level, organizations that bring community residents together for a range of activities are theorized to enhance community collective efficacy which increases neighborhood-level social control of delinquent activity. Thus, these types of facilities would exert an indirect or distal effect on juvenile recidivism.

Civic, Voluntary, and Membership Organizations. As noted in the literature review, empirical evidence examining civic/voluntary/membership organizations and adult crime has been mixed (Slocum et al. 2013; Wo et al. 2016). It remains to be seen if these organizations influence juvenile recidivism. I argue, that in contrast to parks, school facilities or neighborhood community centers, civic/voluntary/membership entities are more exclusive and interest-specific and thus more appropriate to conceptualize as a distal effect. In my dataset, this category includes entities such as neighborhood associations, art councils, membership country clubs, parent-teacher organizations, senior centers, Lions club, as well as martial arts and yoga studios. Although youth may engage directly in services offered by a small subset of these establishments, the bigger story is that these organizations facilitate the coming together of the community that enhance the collective capacity to monitor and correct local social problems. For this reason, I expect

the number of civic and social organizations in an area to be associated with reduced risk of recidivism.

Religious Organizations. A similar argument can be made for a distal effect of social control via religious organizations such as churches and synagogues. The predictions of collective efficacy suggest that religious organizations may reduce juvenile repeat offending by way of social control at the neighborhood-level, so I adopt this conceptualization here. However, empirical evidence from existing research is mixed about whether the spatial distribution of churches influences crime. Willits et al. (2011) reported church location had no significant impact on crime in a study of block groups in Albuquerque, New Mexico. Two additional studies observed a positive relationship between the number of churches and crime (Desmond, Kikuchi and Morgan 2010; Triplett, White and Gainey 2012), while Beyerlein and Hipp (2005) found variation by congregation type. The implication of nearby religious congregations for adolescence delinquency have not been studied.

Proximal Formal Control

Youth and Family Social Services. Some organizations offer more targeted services that exert *proximal formal control*. Their goal is to enhance conventional behavior by providing services or resources designed to assist struggling families. Although youth and family social service providers would likely shirk from the term "formal control" to describe what they do, youth and family services provide targeted resources to alleviate family instability, unemployment, substance abuse or mental and behavioral health needs. In effect, they seek to illicit *specific changes* for families and

individuals that are conducive to non-delinquent behavior. For this reason, I expect the presence of these establishments to reduce recidivism for delinquent youth.

The mental and behavioral health needs of juvenile justice-involved youth are well documented (see Cottle et al. 2001). Poor mental health (Aalsma et al. 2015; Edens, Campbell, and Weir 2007), substance use (Guebert and Olver 2014; Hoeve et al. 2013; Stoolmiller and Blechman 2005), early childhood trauma and maltreatment (Kingree, Phan, and Thompson 2003), child welfare involvement (Baglivio et al. 2016; Huang et al. 2015), and disabilities (Zhang et al. 2011) place youth at a higher risk for repeat offending. Often, youth are referred providers for individual and family counseling services, basic needs, psychiatric and behavioral health treatment, and substance abuse treatment during juvenile justice involvement and juvenile justice professionals recommend that many juveniles continue community services after release (Altschuler and Brash 2004; Greene et al. 2016; Nissen 2011). A spatial mismatch between social services and youth offenders has been cited as an ongoing challenge for juvenile drug courts across the country (Korchmaros, Thompson-Dyck, and Haring 2017). The premise is that social services provide resources that reduce reoffending risk and proximity to these organizations enhances utilization.

Among empirical studies, however, the findings are mixed. Some research suggests that social service use does not reduce criminal behavior. Ex-juvenile offenders in Philadelphia County, PA and Maricopa County, AZ who frequently utilized community social services were less likely to be back in the formal justice system, however their social service use did not influence self-reported anti-social activity or engagement in work or school (Chung, Schubert, and Mulvey 2007). Abrams, Shannon,

and Sangalang (2008) saw no recidivism reduction for participants in a transitional living program compared to a control group. Another report found youth offenders who accessed government social services like child welfare and Medicaid had higher recidivism rates than youth who did not (Cusick, George, and Claussen Bell 2009).

Other studies find that the use of social services reduces recidivism. Oregon youth who accessed mental health or social services after leaving the juvenile correction system were more likely to be working or in school one year after release (Bullis et al. 2004). Lockwood (2012), however, found that distance to social services reduced success. Philadelphia youth found those who lived farther away from substance abuse treatment providers were more likely to drop out of the program early (Lockwood 2012) and were more likely to recidivate that those completing the program (Lockwood and Harris 2013). A meta-analysis of 22 published studies by James and colleagues (2013) suggests a modest, short-term reduction in recidivism among youth receiving social services. Hipp et al. (2010) is the only study that examines the effect of spatial proximity to social services and adult recidivism finding a reduction effect in those offenders with a greater number of social services. It remains to be seen whether a spatial association between social services and juvenile offender behavior exists.

Distal Formal Control

Police Stations and Juvenile Detention Centers. Finally, police stations, juvenile detention centers, and probation and parole offices are charged with monitoring and managing criminal activity. "Hot spot" policing is based on the idea that targeted police presence deters would-be criminals. This borrows heavily from the routine activities approach that having authority presence on the street reduces the opportunities for

motivated offenders to engage in delinquency (Sherman, Gartin, and Buerger 1989). There is strong evidence to support a general deterrent effect from numerous randomized experimental and quasi-experimental research on hot-spot policing tactics, but these studies have typically focused on the patrol routes of police officers, rather than the present of police establishments. (Sherman and Weisburd 1995; Weisburd and Telep 2014). Spatial analysis of drug-related police interventions in Spain found support for a deterrent effect nearer to police stations (Marco, Gracia, and López-Quílez 2017). The logic of routine activities and a neighborhood-level "watchful eye" can be extrapolated to the case of juvenile offenders. These types of establishments could function as deterrents because of the presence of control agents in the area exerts a distal effect on juvenile behavior.

Alternatively, police stations and juvenile detention centers nearby could enhance the likelihood that youthful delinquent acts are detected. Indeed, an important limitation of formal police contact as a measure of crime is that it does not capture delinquency that is undetected, as indicated in self-reported data and victimization surveys (Bartollas and Schmalleger 2014). Having a police station nearby may facilitate the detection and prosecution of youth delinquency, rather than having a deterrent effect. A geographic explanation has been offered as one of many contributing factors to the enduring disproportionate minority contact where minority youth face greater disadvantage in the juvenile justice system. Youth of color are more likely to reside in urban areas which may expose them to more rigorous crime control surveillance than poor white youth in rural areas, or affluent white communities (Institute of Medicine and National Research

Council 2000). Living adjacent to a police station or detention facility may make youthful offenders more likely to be apprehended for repeat violations.

Together, this typology provides a useful scaffold for identifying the types of organizations theorized to influence delinquent behavior via *social or formal control* on a *proximate or distal* dimension. While urban community scholars have argued the presence of neighborhood organizations, or lack thereof, can explain unequal outcomes because organizations link people with resources, ideas, information, and relationships with others, this idea has not been examined in relation to youthful offenders. Yet, as demonstrated in this chapter, there is strong theoretical logic that specific organizations can exert social and formal control over would-be offenders by increasing their bond to society, providing adult supervision, and engaging youth in conventional activities.

My conceptual models are shown in Figures 2-2 and 2-3. My data are cross-sectional, rather than longitudinal, so I have shown the predicted associations rather than causality in the models. I expect that neighborhood disadvantage is positively associated with recidivism risk for juvenile offenders. The primary theoretical framework for this prediction is social disorganization theory which associates economic deprivation with a lack of social control and collective efficacy. It follows that organizations that enhance formal or social control of juvenile behavior in the neighborhood should be associated with a reduced risk of recidivism. The de-institutionalization perspective however leads me to expect that neighborhood disadvantage will be associated with a lower density of organizations that protect against future offending. This depicts a mediation relationship where part of the association between neighborhood disadvantage and recidivism can be attributed to a lack of organizations in the community.

Figure 2-2. Conceptual Model of Neighborhood Disadvantage and Recidivism

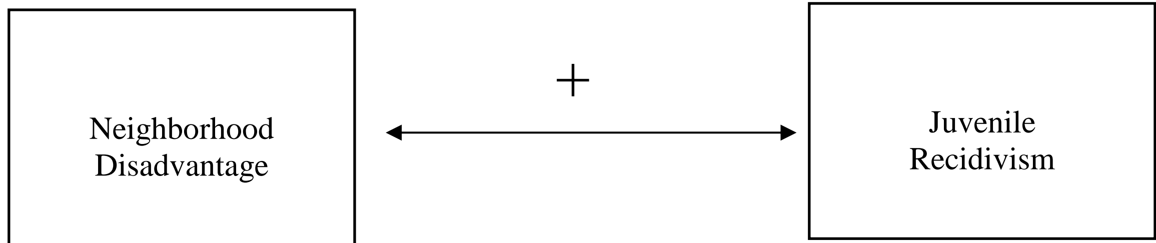
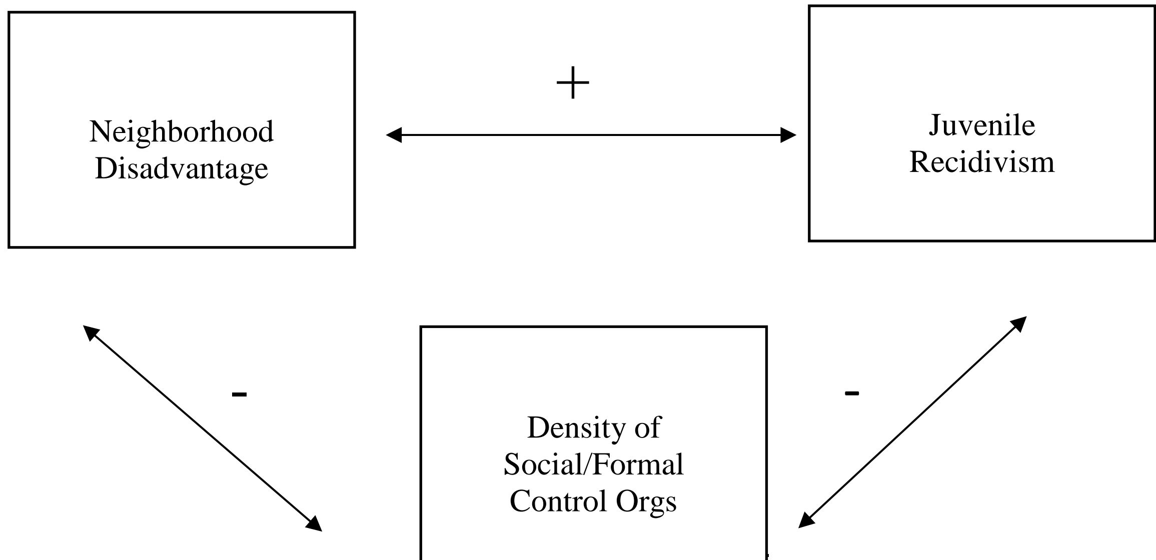


Figure 2-3. Conceptual Model of Disadvantage, Organizations, and Recidivism



CHAPTER 3: METHODOLOGY

This chapter describes in detail the data and methods that are used in each of the three empirical chapters of this dissertation. I provide a detailed reporting of the data collection and coding procedures for my three sources of data on juvenile offenders, neighborhood characteristics and organizations.

Analytical Approach and Methodological Contributions

In Chapter 4, I examine the extent to which there is spatial patterning in the distribution of aggregate neighborhood disadvantage, organizations, and reentering juvenile offenders across the study area. I use an exploratory approach using descriptive maps that visually display tract characteristics (e.g., disadvantage score) and point-level data (e.g., locations of public parks across the metropolitan area). I report findings from spatial regression models predicting the density of organizations per capita and the density of the juvenile offenders, controlling for tract demographic and socioeconomic characteristics. This chapter provides a spatial context for dynamics at the metropolitan level that inform subsequent chapters.

In Chapter 5, I predict the risk of juvenile recidivism by type of new offense and differentiate between juvenile offenders who have completed diversion (low-level offenders) and those who have completed probation (more serious or chronic offenders). I assess the extent to which a composite measure of neighborhood disadvantage influences recidivism risk. First, I model individual risk of recidivism using offender characteristics and then I add in a composite measure of neighborhood disadvantage.

In Chapter 6, I use a geographic buffer to calculate the number of organizations accessible within walking distance of each reentering juvenile offenders' residence. My

final models examine risk of recidivism by type of new offense, differentiated by population, accounting for individual predictors, aggregate neighborhood disadvantage, and the number of key organizations within a youth's walkable buffer.

The Setting: Neighborhood Effects in the Urban Southwest

My dissertation adds to the literature on neighborhood effects by offering a contrasting setting to the typical Chicago case. Much of what we know about neighborhood effects comes from landmark research conducted in large, mid-Western or Eastern cities such as Chicago or Philadelphia with clearly demarcated neighborhood boundaries (e.g., Sampson, Raudenbush, and Earls 1997; Wilson 1987; 1996). Less is known about how spatial proximity to organizations might matter for residents in sprawling urban areas more typical of the West coast and Sunbelt regions of the United States.

As an archetypical case, the greater Phoenix metropolitan area is a conglomeration of smaller cities and unincorporated areas that bleed together without clear delineations (Gober 2006). Not only are neighborhood boundaries less defined, but the metropolitan area growth is relatively uninhibited by geographical constraints or existing infrastructure and is encouraged (Nickerson and Dochuk 2011). There is an increasing scholarly attention to heterogeneity in neighborhood population characteristics and organization densities (Small 2008). Thus, the main take away is that the influence of neighborhood likely varies in different contexts and a study in the Sunbelt contributes to a larger conversation on urban dynamics more generally.

The Phoenix-metropolitan area, Patricia Gober (2006) writes, has been shamed by urban critics for sprawling, low density growth that makes reliance on car transportation a

feature of life, a banal built environment of boxy suburban homes that discourage informal interaction among residents, and a lackluster downtown (p. 104). One might argue that these features of the urban landscape make an organizational perspective on neighborhood effects uninteresting or irrelevant. However, I argue that is precisely these elements that make the Phoenix area intriguing to urban scholars. Most of what is known about juvenile recidivism and neighborhoods has been based on data from Chicago (Wallace and Papachristos 2012; Wallace 2015) or Philadelphia (Mennis et al. 2011; Grunwald et al. 2010). Only one study of youthful recidivism and community context has been conducted in Arizona (Wright and Rodriguez 2014) and it focused on the influence of immigrant concentration, rather than organizations. Like Wright and Rodriguez (2014) the present study broadens the lens of neighborhood effects by studying a sprawling metropolis in the southwest and focusing on the role of spatial proximity to organizations.

The Offender Population: Differentiating by Diversion and Probation Supervision

I chose to analyze juvenile offenders reentering from diversion and probation separately, since these are two substantively different juvenile justice processes[4]. Evidence suggests youth who are prosecuted formally rather than completing diversion for minor offenses are significantly more likely to repeat offend which supports my rationale for splitting the sample (Barrett and Katsiyannis 2017). There is also a dearth of research that examines juvenile offender recidivism using data on boys and girls; studies

[4] There were 111 instances in 2007 where juveniles appeared in both the diversion and probation files because they completed diversion and then obtained a new complaint which placed them on probation, or because they were transferred directly from diversion to probation representing a continuation of supervision rather than completion. These cases were dropped from the diversion files and were analyzed as part of the probation files because their last point of contact with the juvenile justice system in 2007 was with probation.

have largely focused on male offenders with few exceptions (Jacob 2006; Wright and Rodriguez 2014; Wolff et al. 2015), so my assessment of male and female youth is a valuable contribution.

There are two primary supervision tracks, diversion and probation, for youth who are processed as juveniles by the Maricopa County Juvenile Probation Department. Rules 28-31 of the Arizona Revised Statues Annotated describe the legal processes that occur in the juvenile court. When a youth is apprehended for delinquency or a status offense, the initial referral or complaint is sent to the county attorney's office. Then the county attorney gathers evidence on the alleged offense and the severity of the offense to decide whether to formally prosecute the youth by filing a petition in juvenile court, recommending the youth for diversion, or sending the youth to be processed in the adult court. For minor offenses or first-time offenders, youth may receive a referral to the early intervention tract known as diversion. Diversion youth do not appear before a judge for a formal adjudication. Instead, they are assigned consequences (e.g., community service, apology letters, referrals to services for academic assistance, counseling, substance abuse treatment) from a probation officer, diversion program, or a community justice committee. The intent of diversion services is to provide accountability for delinquent youth in a less punitive environment than formal juvenile court proceedings in the hopes that this will deter youth from repeat involvement in the justice system. On diversion, youth may receive consequences from a community justice committee, a probation officer or during participation in a diversion program. Those who are compliant with their consequences successfully end diversion. Those who failed to

complete their consequences or incurred new complaints are referred to the county attorney's office.

A probation tract describes the process for youth who are formally adjudicated delinquent. These youth have a formal petition filed against them by the county attorney's office. Youthful offenders are tracked through a series of hearings, at which point the judge may transfer the youth to adult court or dismiss the case. The advisory hearing is used to inform the youth of the charges filed against them and their legal rights, as well as determine whether the juvenile admits or denies the charges. An adjudication hearing is comparable to a trial in adult court where the judge hears evidence against the juvenile and determines whether to dismiss the case or deem the juvenile responsible beyond a reasonable doubt. Consequences, such as the conditions of probation supervision, fines imposed, or mandatory services, are imposed at the disposition hearing, based on written recommendations from probation officers. My analysis is on youth who have been compliant with these consequences and successfully complete juvenile probation.

Modeling Recidivism Over Time by Type of Offense

I made two analytical choices about how to model recidivism that extend the current state of juvenile recidivism research. First, I chose to model the risk of recidivism for any type of new offense, as well as for specific subcategories of status/public peace, property, and violent/drug offenses (Table 3-1). Although I am not directly testing the idea of offender specialization (i.e., that prior drug offenders will continue to offend for the same types of offenses), this differentiation allows me to observe patterns that exist (see Baker et al. 2013).

Another reason to divide the outcome by type is that Grunwald et al. (2010) found that only drug recidivism was sensitive to aggregate levels neighborhood disadvantage and social capital in their study of male offenders in Philadelphia. I do not make specific predictions about which types of offenses may be sensitive to which organizations, but this analytical separation allows me to observe variation in the influence of neighborhood context on offending patterns.

Table 3-1. Recidivism Categories and Examples

Type	Offense Examples
Status/Public Peace	Excessive Speed Disorderly Conduct Runaway Within County Alcohol Under Age Consumption Tobacco Violation Involving a Minor
Property	Burglary Shoplifting Graffiti, Criminal Damage Theft Means of Transportation
Violent/Drug	Aggravated Assault Aggravated Robbery Simple Assault Intent to Cause Injury Threatening or Intimidating Drug Paraphernalia Possession of Marijuana Drugs On/Near School Grounds

I opted to utilize Cox proportional hazard models to examine recidivism risk using days to new offense. Much of what we know about the impact of individual characteristics, offense history, and neighborhood context on juvenile repeat offending is based on studies with a binary outcome measure, rather than time to new offense (Baglivio et al. 2017; Grunwald et al. 2010; Harris et al. 2011; Wright and Rodriguez

2015). The concerns of dichotomizing continuous data are well documented elsewhere (Long 1997). My dataset provides detailed information on the timing of juvenile offense, so I use survival analysis, based on days to new offense rather than a dummy variable of recidivism. I provide more detail in the empirical chapters.

Data Description

I use three main sources of data including juvenile offender data from Maricopa County Juvenile Probation, tract-level census data from the American Community Survey (ACS) for 2005-2009, and geolocated organization data on the greater Phoenix metropolitan area compiled for a multi-year NSF-funded research project on children's activities[5]. In this section, I describe how these data were obtained and initially coded and cleaned. Each empirical chapter also contains a short methodology section that describes coding or analysis decisions that are specific to that chapter.

Juvenile Offender Records

I obtained deidentified juvenile offender records on reentering youthful offenders from the Maricopa County Office of Juvenile Probation. Maricopa County Office of Juvenile Probation tracks data for all juveniles who are apprehended and receive a referral (also known as a complaint) within the Maricopa County authority. Each youth is assigned a unique identification number the first time they enter the juvenile justice system which tracks their offense history, time spent in juvenile detention, and when the juvenile was released from court supervision. Each subsequent complaint is logged using the same identification number, so youth offending histories can be tracked over time.

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[5] The 2007 data were collected using funds from "Non-Profit Organizations and Recession" (SES 1154652) and "Organizations and their Impact on the Urban Community" (SES 0852641).

My data included only reentering juvenile offenders ages 8-17 who successfully completed diversion or probation with Maricopa County Juvenile Court between January 1, 2007 to December 31, 2007. Typically, the term "reentry" is applied to individuals returning home after a period of separation (i.e., imprisonment, residential treatment, military service). I use the term reentering youth here to describe youthful offenders who have successfully completed their consequences in either supervision track. I do this to keep them analytically distinct from offenders on continued supervision[6]. These youth are at the critical point where successfully community integration can make or break their continued juvenile justice involvement.

My key measures included demographic characteristics, offense history, and supervision history. I obtained recidivism data for each juvenile for up to one year after release which captured the type of new offense, if any, and days to the first new offense. Maricopa County Office of Juvenile Probation provided approximate geocoded XY coordinates for youth who had a valid street address on file when they completed diversion or probation. For confidentiality purposes, residential addresses were offset slightly in the geocoded file before I received them and represent a good approximation of the juvenile's residential location.

Sample Exclusionary Criteria. I excluded juvenile cases that were dismissed outright and cases where youth paid a fine/restitution but did not undergo any supervision on diversion or probation because the juvenile justice involvement was so limited. Based

[6] "Reentry" is an imperfect term. Diversion youth are not formally charged or typically confined in a juvenile facility. However, I argue that "reentry" embodies the premise of restorative justice programs, such as the diversion programs in Maricopa County. The idea of restorative justice is that youth have violated the community and need to make amends to be fully integrated back into society (Rodriquez 2007). Viewed through this lens, youth ending their consequences are at a critical juncture where neighborhood opportunities and constraints may play a role in their recidivism risk.

on best practices in juvenile recidivism research, I also excluded offenders who were committed to ADJC (Arizona Department of Juvenile Corrections) and sex offenders (Cottle et al. 2001). I analyzed only juveniles with valid geocoded point data because locational data are the primary focus on my research. Eighty-four percent of probation youth and 83% of diversion youth fitting the sample criteria had a valid address successfully geocoded within the study catchment area which is comparable to previous work using geocoded offender addresses (Hipp et al. 2009; 2010; 2011).

Census Data

My second source of data came from the U.S. Census Bureau's American Community Survey (ACS). I used the five-year American Community Survey estimates (2005-2009) with my year of study, 2007, as the midpoint year with 2000 census tract boundaries. Annual data are not collected for small spatial units such as census tracts or zip codes, so 5-year ACS estimates are optimal to provide the most reliable estimates with data collected over 60 months. My ACS measures included percent Latino, percent Black, percent Native, percent of residents age 10-19, percent of residents age 65 and over. I used factor analysis to generate a composite variable of disadvantage from percent unemployed, percent in poverty, percent of female-headed households, percent with no car, percent with different house in past year, and median family income[7].

Organization Data from the Phoenix Children's Activities Project

My third source of data on organizations came from a larger project on the Phoenix area funded by the National Science Foundation. I worked as a graduate

[7]Prior work on neighborhoods and recidivism have used composite variables with similar components (Hipp et al. 2010, Grunwald et al. 2010, Wallace 2015).

research associate on the project and was involved in data collection, coding, and geocoding. The initial wave of the study began in 2003 with a random-digit dial phone survey of children's leisure activities on Saturdays in the Phoenix-Mesa metropolitan area for area codes beginning with 480, 602, and 623. The survey collected data from families with children ages 5 to 12 on activities that one child in the family did outside the home on the previous Saturday (see Galaksiewicz, Mayorova, and Duckles 2013 for a detailed description of survey administration and data collection procedures). To better understand choice of children's activity providers and satisfaction with provider choice, the research team identified the type of establishments that children and families utilized for services including those where children accompanied adults (e.g., baseball league, Home Depot, mall). The team constructed a spatial catchment area covering the area code boundaries that overlapped with both Maricopa and Pinal counties. A team of research associates collected data on the population of establishments for 94 Standard Industrial Classification (SIC) codes matching the types of establishments families utilized with the catchment area in 2003, 2007, 2008, 2009, and 2013. For this project, I analyze 2007.

To obtain a comprehensive dataset of establishments in the Phoenix-Mesa metropolitan area, the research team consulted numerous sources because no single source contained adequate establishment data coverage across the three sectors of for-profit, non-profit, and government entities. Provider data were collected at the establishment level. For example, all branch locations of the Valley of the Sun YMCA were included individually, rather than just a single entry for the YMCA as a single organization. This offered a finer-grained analysis than counts of establishments using

County Business Data, for example, to assess what is in the immediate neighborhood of reentering juvenile offenders. Most but not all organizations in our datafiles had a brick and mortar location. Others, like Homeowner's Associations may operate out of a residents' home but have a geographically specific presence that we wanted to capture[8].

The data files were constructed from a variety of sources including: Dun and Bradstreet, the National Center for Charitable Statistics, phonebooks, and web searches. A baseline file was generated using Dun and Bradstreet which provided data on establishments including the name of the organization, SIC code, and physical address. Dun and Bradstreet had good coverage of for-profit entities but did not have a comprehensive list of non-profit or governmental entities.

To supplement the Dun and Bradstreet data file, the research team obtained information on government facilities for a subset of organizations where service locations are government run. The research team conducted comprehensive searches to obtain government providers for parks, pools, fitness facilities, community centers, and libraries. Once a comprehensive list was compiled for each year, we verified the open and closure list with government officials within each municipal area. On occasion, members of the team physically visited sites to verify that what appeared to be greenspace online was indeed a public park. Each government provider was assigned an SIC code based on the primary purpose of the establishment.

[8] There are some entities, specifically small non-profit entities, and religious ministries, that served a population beyond the local area (e.g., raising money to build schools in Thailand). This would be problematic if my argument was based on goods/services from every establishment being used in the local community. However, for the distal, social control category which includes civic/membership/voluntary organizations, my argument is that the effect on juvenile recidivism is not about the specific goals of the entity, but the bringing together of community members in social/civic engagement.

Non-profit establishments were compiled from three sources in addition to Dun and Bradstreet. The team obtained the Business Master Files (BMF) for each year from the Urban Institute's National Center for Charitable Statistics (NCCS) which has tax data for non-profit chartered organizations. We compared the 501(c)3, 501(c)4 and 501(c)7 files from the NCCS with the Dun and Bradstreet files. This was necessary because the NCCS Business Master File data sometimes had only the main charter organization location rather than the individual branch location (e.g., main branch of the Boys and Girls Club). Research associates manually crosschecked the Dun and Bradstreet files with the BMF data to rule out duplicates. Each BMF entry was assigned the proper SIC code using a SIC-NTEE crosswalk corresponding to the primary purpose of the organization so the SICs could be used to pull comparable entities from all auspice files.

There were two categories of organizations that were still underrepresented in the files comprised of BMF and Dun and Bradstreet data, so the research team collected additional data to ensure a more accurate file. Additional youth sports leagues and recreation club (e.g., YMCA, Boys and Girls Club) entries were collected using web searches which were verified using the Arizona Corporation Commission website. These were added to the file after duplicates were removed and each entry was assigned the appropriate SIC code. For the larger project, it was necessary to obtain additional data on religious congregations. While both the BMF and Dun and Bradstreet files contained religious congregations, these sources did not have completed coverage of congregations. To supplement these files, research associates coded entries listed in two separate phonebooks since church congregations were highly likely to list in the phonebook,

compared entities across the four files to rule out duplicates, and added the unique entries the establishment file.

Each establishment was geocoded to a locational point to allow for spatial proximity analyses. Using the ArcGIS geographic information systems platform, the team geocoded the establishment data which assigned a geographic XY point coordinate to each case. Roughly 80 percent of the establishments geocoded automatically to a point using an address locator based on the street grid of Maricopa and Pinal counties. However, a large proportion of the file did not match automatically because of limitations in the address data, so these entries had to be geocoded manually. For example, Dun and Bradstreet often had shortened address names that were not consistent (e.g., Doubletree Ranch might be shorted to Dbletree Rnch in one instance and Doubltree Ranch in another instance) that did not automatically match to the correct road segment, so research associates manually assigned the organization to the correct XY point within ArcGIS. In the 2007 file, 97.6% of establishments were successfully geocoded to a street address point.

My organization data were largely drawn from the project as described above but some subgroups required supplementation or additional coding. I grouped the establishments into the categories described below based on SIC code and did not differentiate between auspice.

Community centers (N=130). This category included YMCAs, Boys and Girls Clubs and community centers open to for general usage. Community centers were assigned a range of SIC codes in the Dun and Bradstreet dataset (7997 membership sports and recreation clubs, 7999 amusement and recreation services not otherwise classified,

8299 schools and educational services not otherwise classified, 8322 individual and family social services, 8641 civic, social, and fraternal associations), so community centers were flagged during a manual inspection of these five categories. Senior centers and centers tailored to serve special populations (e.g., LGBTQ) were excluded and added to the social services category described below.

Public libraries (N=51). This category included establishments with SIC code 8231 that were verified to be a government library accessible by the public. I excluded entries such as university libraries, a law library and a braille library that operated exclusively by mail.

Public parks (N=576). This category included establishments with SIC (7999 amusement and recreation services not otherwise classified) that underwent an extensive vetting based on visits to city websites and calls to municipal administration offices to verify dates of existence. Entities were coded as parks if they were general purpose spaces open to the public. Specialized sports facilities owned or managed by city governments (e.g., Red Mountain Baseball Complex) and private parks such as HOA recreation centers are in the civic, voluntary, and membership organizations category.

Middle and high schools (N=340). This category included establishments with SIC 8211 (elementary and secondary schools). This file underwent additional detailed coding using the Arizona Department of Education website, the Arizona Corporation Commission, and the Internet Wayback machine of school websites to verify level and charter (district, charter, and religious/secular private school) in 2007. I excluded elementary schools including K-8, preschools, technical schools, specialty schools not

accessible to the general community (e.g., school for autistic children, online schools), and district offices. K-12 schools were retained in this category.

Civic, voluntary, and membership organizations (N=5,134). This category included organizations with SIC 8641 (civic, social, and fraternal associations) with entities like the Lions Club, Kiwanis, alumni and neighborhood associations, parent-teacher organizations, senior centers; SIC 8699 (membership organizations not otherwise classified), art councils, athletic associations (regulatory only), animal rescue, toastmasters; SIC 7997 (membership sports and recreation clubs) which includes: sports and clubs restricted to use by members (country clubs, little league, recreation centers of sun city); and SIC 7999 (amusement and recreation services not otherwise classified).

Religious congregations/ministries. (N=4,711) This file was originally comprised from three separate sources including the SIC 8661 (religious organizations) for Dun and Bradstreet, the Business Master Files and two phonebooks (as described above). This complete file was then checked for duplicates and for entities wrongly categorized (e.g., Church's Chicken restaurants). Our interest for the larger project was in capturing congregations, rather than other religious-based organizations such as food-banks, mission organizations, or faith healers so line-by-line verification of these entities was conducted using the ACC and web searches to verify types of services provided and removing those entities that could be confirmed as something other than a religious congregation. Some congregations shared facilities, but these were not treated as duplicates, but rather as distinct entities as they appeared in the file[9].

[9] Mormon religious congregations, called wards, are organized in this fashion with distinct congregations meeting at variable times throughout the day. Another example is an English-speaking Protestant congregation holding services in the morning and a Korean congregation using the building in the evenings.

An extensive secondary coding was conducted of all religious congregations and ministries. For roughly 7% of the religious organization file, it was impossible to determine whether an entity was a congregation or another type of religious organization/ministry. Coders took detailed notes of the entity activities based from historic web information. Many of these non-congregations were ministries that merited inclusion in my study as entities that provide community support and social control by providing social service/outreach, charities, local/global ministries, church support activities, religious schools. Some training groups and international ministries do not target Phoenix populations directly, but do draw members together and generate collective efficacy, these entities are evidence of a type of social cohesion. Since it was impossible to separate these categories further, I included all entities except those that were clearly not establishments drawing people together for religious practice or religiously-motivated action. I excluded confirmed non-religious places of retail (e.g., Jesus Tacos, Heavenly Autobody Repair), commercial wholesalers, and names of individuals with no additional information (e.g., Jesus Romero).

Social Services (N=2,437). This category was comprised of data from three sources (Dun and Bradstreet, the Business Master File, and a referral list obtained from Maricopa County Office of Juvenile Probation). I obtained an internal document from 2007 used by Maricopa County Juvenile Probation officers and judges as a quick reference guide to consult when referring youth to services. This document contained 59 unique entities names of counselors, treatment facilities, and other services to provide: delinquency prevention/behavior specific classes (e.g., anger management), competency restoration, evaluation and clinical diagnosis, ancillary services (e.g., polygraph,

professional consultation), outpatient mental health, substance abuse services, sex offender services, violence intervention, functional family therapy (FFT), multisystemic therapy (MST), advocacy programs, foster home and out-of-home placement services[10]. This list was not exhaustive of the types of services that probation officers and judges used for youth offenders. Korchmaros et al. (2016) found that drug court professionals in other jurisdictions reported regularly making formal referrals as well as informal recommendations to families and youth for services such as basic needs and housing assistance so combining the internal list with a broader spectrum of social service agencies was warranted.

To capture the larger population of social services, I added data from the project file on two SIC codes that were pertinent to social services. I selected SIC 8322 (individual and family social services) which included a range of services including counseling, youth centers, treatment facilities, debt counseling, legal help, affordable housing, food banks, centers as well as specialized family services for the disabled and elderly. I also examined SIC 8093 (specialty outpatient clinics NEC) since residential substance abuse or mental health treatment facilities were coded under this category, as well as AA meetings and halfway houses. However, there were some outpatient facilities that were not relevant to social services, such as physical therapy or outpatient surgical centers for endoscopic procedures. To filter out irrelevant resources, I examined all entries in this category line-by-line and used the resource name and/or internet searches to determine misfits. I removed only entries from the file where I could obtain sufficient

[10] Often these entities provided more than one type of service (e.g., substance abuse treatment and multisystemic therapy) and appeared more than once in the Maricopa County file. I collapsed these duplicates into one entry to capture establishments rather than programs to be consistent with other files.

information to rule out social services provision (e.g., cosmetic surgery, auto parts shop, bail bonds). Communities centers were removed since they appeared in an earlier category and Boy Scouts and Girl Scouts were moved to the civic, voluntary, and membership category. I cross checked the file against the Maricopa County referral list and added in new entities that were not contained in the project file. I used online searches of the ACC to verify addresses based on historical scanned documents, the Internet Wayback machine for 2007, and the Arizona State Board of Behavioral Health Examiners Licensure to check individual counselor license information. I was unable to verify the address for 21 cases from Maricopa County that had incomplete online information to verify or were located out of the area. Most of these were individual counselors used for psychological evaluations.

Police and Juvenile Detention Centers (N=44). These data were collected exclusively for this dissertation. I conducted web searches of police department pages for each police district within the study area (e.g., municipal and county) to generate a list current for 2016. Then, I used the Internet Wayback machine to view the police websites in 2007 and modify the list based on what was in existence in 2007. I called one authority to verify a facility not listed online. I did this same process for the juvenile detention centers in Maricopa County, of which there are two. I excluded adult jails and prisons such as the Arizona Department of Corrections; many of these facilities are co-located. For example, a police station is directly adjacent to the detention center. In my analysis of individual offender risk, I used a dummy variable to account for a nearby facility because theoretically a single facility would be sufficient to provide this deterrent effect.

CHAPTER 4: A TRACT-LEVEL ANALYSIS OF THE SPATIAL DISTRIBUTION OF ORGANIZATIONS, TRACT CHARACTERISTICS AND REENTERING JUVENILE OFFENDERS

It is well established that juvenile offenders are not isolated actors, but rather belong to families, schools, peer groups, and communities that structure their opportunities for and orientations towards delinquency. Although the neighborhood effects literature arose in large part to study crime, neighborhood dynamics have been understudied in relation to youth repeat offending. No prior work considers whether a spatial pattern exists between valued organizations and juveniles at risk of recidivism. This task of this chapter is to fill this gap in the literature by examining the spatial distribution of reentering juvenile offenders, neighborhood disadvantage, and the density of organizations theorized to exert social and formal control. The focus of this chapter is to establish whether there is spatial patterning in the distribution of organizations and reentering juvenile offenders. Why organizations settle where they do (i.e., tax policy, commercial zoning, building availability, competition, agglomeration, potential clients/employees) is an important question that is larger than the focus of this dissertation. My interest here is first to establish if patterns of spatial inequality exists and second, to shed light on the potential consequences for repeat youth offender behavior following juvenile justice completion.

This chapter tackles this question in an exploratory manner at the metropolitan-level using census-tract level data described below. I use the following questions to guide this study:

1. *What is the spatial distribution of socioeconomic disadvantage, reentering juvenile offenders, and organizations across the study area?*
2. *Is socioeconomic disadvantage associated with fewer organizational resources per capita?*
3. *Are there more reentering juvenile offenders in areas with fewer organizations per capita?*

Literature Review

Spatial Inequality and Individual Outcomes

The idea that a geographic mismatch between organizations and residents in poor areas perpetuates and exacerbates urban poverty has become a mainstream explanation for enduring neighborhood effects (Sampson 2013). Spatial inequality refers to unequal access or exposure of different people and subgroups to an area's valued resources (Logan 2012). Conversely, spatial inequality can also refer to unequal exposure to harm such as hazardous waste, noise, and pollutants (Crowder and Downey 2010; Downey 2005, Downey and Van Willigen 2005). Research suggests that levels of disadvantage in a census tract are correlated with the density of valued organizations. Most of this work is informed by a de-institutionalization perspective predicting that concentrated poverty reduces the density of organizations which places residents of these neighborhoods at a greater disadvantage than residents of more affluent and resource-rich neighborhoods (Wilson 1987). The spatial mismatch hypothesis suggested that a geographic separation between jobs and inner-city residents contributed to discrepancies between white and black unemployment (Kain 1968). Indeed, a recent article by Clifford (2018) observed an enduring spatial mismatch of charitable institutions in England. Poor neighborhoods

had fewer establishment per capita and had higher rates of voluntary organization dissolution over time.

However, some scholarship suggests that the de-institutional perspective is limited by organization type and urban context. Small and McDermott (2006) studied the distribution of ten organizational resources across 331 metropolitan areas in the United States and observed that poverty and the percentage of foreign-born were positively associated with the number of establishments. However, the percentage of black residents was negatively associated with establishments, which they argue is evidence that de-institutionalization of poor neighborhoods observed in previous studies is reflective of poor, black neighborhoods specifically rather than of poverty rates alone (p. 1705). Indeed, there is some evidence that poor neighborhoods, particularly in U.S. cities, are not deprived of nonprofit organizational resources (Marwell and Gullickson 2013). For example, Wo (2016) found a non-linear u-shaped relationship between nonprofit density and concentrated disadvantage in Los Angeles neighborhoods where poor tracts had slightly more nonprofits per capita than more affluent areas of Los Angeles. Likewise, Peck (2008) observed that anti-poverty nonprofits were more likely to be in impoverished neighborhoods in the Phoenix-metropolitan area indicating that it is prudent to examine the spatial distribution of other subgroups in my study area, rather than assuming a uniform distribution by disadvantage.

Organizations and Juvenile Crime

Most work on spatial mismatch has emphasized aggregate compositional characteristics such as race or class rather than examining the extent to which spatial inequality in the distribution of organizational resources exists for high-needs population

such as juvenile offenders. A few studies of adult offenders have considered spatial mismatch between organizations and reentering adult populations as a factor in repeat offending (Hipp et al. 2009; 2010; 2011; Wallace and Papachristos 2013; Wallace 2015). Surprisingly, there is no empirical work examining whether there is a spatial mismatch between community organizations and juvenile crime.

As reviewed earlier, the idea that organizations are necessary for the social order draws heavily on Shaw and McKay's social disorganization theory (1942). They proposed that three factors, highest socioeconomic disadvantage, high ethnic heterogeneity, and high residential mobility, typified areas of social disorganization where delinquency and crime would be high because these conditions limited the ability for residents to maintain order in the neighborhood. In a contemporary revival of this logic, Sampson and colleagues offered the term "collective efficacy" to describe social connections among residents that generate neighborly trust and facilitate social control at the neighborhood-level (Sampson et al. 1997; Sampson 2013). Organizations, it follows, particularly those that bring residents together such as civic groups, religious congregations, or community centers can also be viewed as part of the social fabric of a community. The fundamental premise of these perspectives, which I described thoroughly in Chapter 2, is that some types of organizations provide both intangible and tangible benefits to a neighborhood. However, whether youthful offenders experience spatial inequality relative to organizations that can inhibit or enhance risks of delinquency remains an empirical question to be addressed in this chapter.

Juvenile Offender Reentry

Applying these ideas to the study of juvenile reentry is rather straightforward[11]. Previous spatial studies of juvenile offender reentry and recidivism have focused solely on neighborhood disadvantage or offender contagion as environmental risks for reoffending. What is not understood is whether there is a spatial mismatch between organizations and reentering youth offenders that may contribute to their likelihood of success after completing court programs. To what extent are these communities able to successfully reintegrate juvenile offenders who have served their consequences? This is a different question than asking what environmental risks place juveniles at risk of initial delinquency or escalation of offending severity while under supervision.

The main premise is that organizations in a neighborhood may influence juvenile offender behavior by increasing or decreasing social/formal control of offenders directly (proximal effect) or indirectly (distal effects). Three theories of juvenile delinquency suggest organizations are vehicles for social integration necessary for successful reentry and recidivism reduction. *Routine activities approach, differential association theory, and social control theory* (Cohen and Felson 1979; Sutherland 1947; Hirschi 1969) emphasize social and formal control as necessary to prohibit delinquency. Adult supervision, reduced affiliation with delinquent peers, and conventional activity involvement are theorized to enhance the social bond, reducing both the motivations and opportunities for crime and delinquency.

[11] I use the term reentering juvenile offenders to refer to youth who have successfully completed a diversion program or probation supervision in order to keep them analytically distinct from juveniles who repeat offend during active court-involvement.

The choice to examine reentering juvenile offenders is strategic. The stage when youth complete their court-involvement is viewed by juvenile justice professionals as a critical time for reintegration into the community, even for those juveniles who were not confined in a detention facility or residential treatment facility prior to completion. Youth are encouraged to continue accessing valued services (i.e., counseling) or begin new conventional activities (i.e., sports, school) that will keep them out of trouble. Services such as counseling, pro-social activities, substance abuse treatment, basic needs, and community service programs are considered important for successfully reentry when youth leave residential treatment programs or graduate from drug court (Aalsma et al. 2015; Abrams et al. 2008, Abrams and Snyder 2010; Korchmaros et al. 2017). Thus, the spatial accessibility (or inaccessibility) of these resources may influence youth repeat engagement with the law.

Methodology

Prior Research on Phoenix Organizational Densities

My work draws on previous findings from a larger project on establishments in the Phoenix area as described in detail in the methodology chapter. However, this chapter is distinctive because I analyzed a subset of organizations and year (2007) that have not been previously studied. My research also departs from the larger project because I linked spatial organization data to geolocated juvenile offender data.

Two previous papers from the larger project are directly relevant to this chapter. Both examine the distribution of organizations relative to population characteristics, and the extent to which spatial access influenced use children’s activities (Galaskiewicz et al. 2016) and health care utilization (Anderson 2016). In the first paper, Galaskiewicz et al.

(2016) reported that in 2013, physical fitness and health recreation establishments were not equitably distributed across the Phoenix-Mesa urbanized area. We compared the characteristics of zip codes using data from the U.S. Census Bureau American Community Survey and counts of establishments per capita. Results from this study indicated that zip codes with higher median family income had more membership sports and recreation clubs, physical fitness centers, and dance studios. In contrast, zip codes that were poorer and in areas with a greater proportion of children had fewer membership sports and recreation clubs, physical fitness centers, and bowling centers, but had more public parks. Percent black was unrelated to organizations per capita for recreation and healthcare facilities, but areas with a higher proportion of Latino residents had more physical fitness facilities, public golf courses, and general medical offices and hospitals. Finally, the percentage of children in a tract was inversely related to membership and sports organizations.

Using a different subset of organizations from the same Phoenix area study, Anderson (2016) focused on the extent to which racial segregation, particularly the clustering of minority populations in proximate tracts, was related to the density of health-related organizations at the zip code level in 2013. She examined the percentage of residents in poverty, the percent over age 65 and three measures of racial clustering for Latino, Native American, and black residents, respectively. She observed no effect in areas a high clustering of black residents, but tracts with a greater proportion of Native American residents had fewer doctors' offices, controlling for poverty. Similarly, areas of high Latino clustering had fewer doctor offices/health care practitioners and health services but were proximate to major hospitals. These findings led me to expect spatial

variation in organizational densities for 2007 based on race/ethnicity and age of residents, in addition to socioeconomic disadvantage.

Spatial Catchment Area and Spatial Unit of Analysis

The spatial catchment area for my study was based on the largest perimeter for which I had complete data on both juvenile offender records and organizations. As shown in Figure 4-1, this represents the intersection of Maricopa County (juvenile offender records) and the area codes for 480, 602, and 623 used in the original organizational data collection which was based on phone surveys[12].

I used the census tract as my spatial unit of analysis within this catchment area. I used 2000 tract boundaries which align with the American Community Survey (ACS) data I used. I analyzed the 652 census tracts (using 2000 boundaries) with more than 300 residents. The size of the census tracts in my study varied widely[13]. My interest was in identifying the density of organizations relative to the potential demand, so I used population density measures (counts per 1,000 residents).

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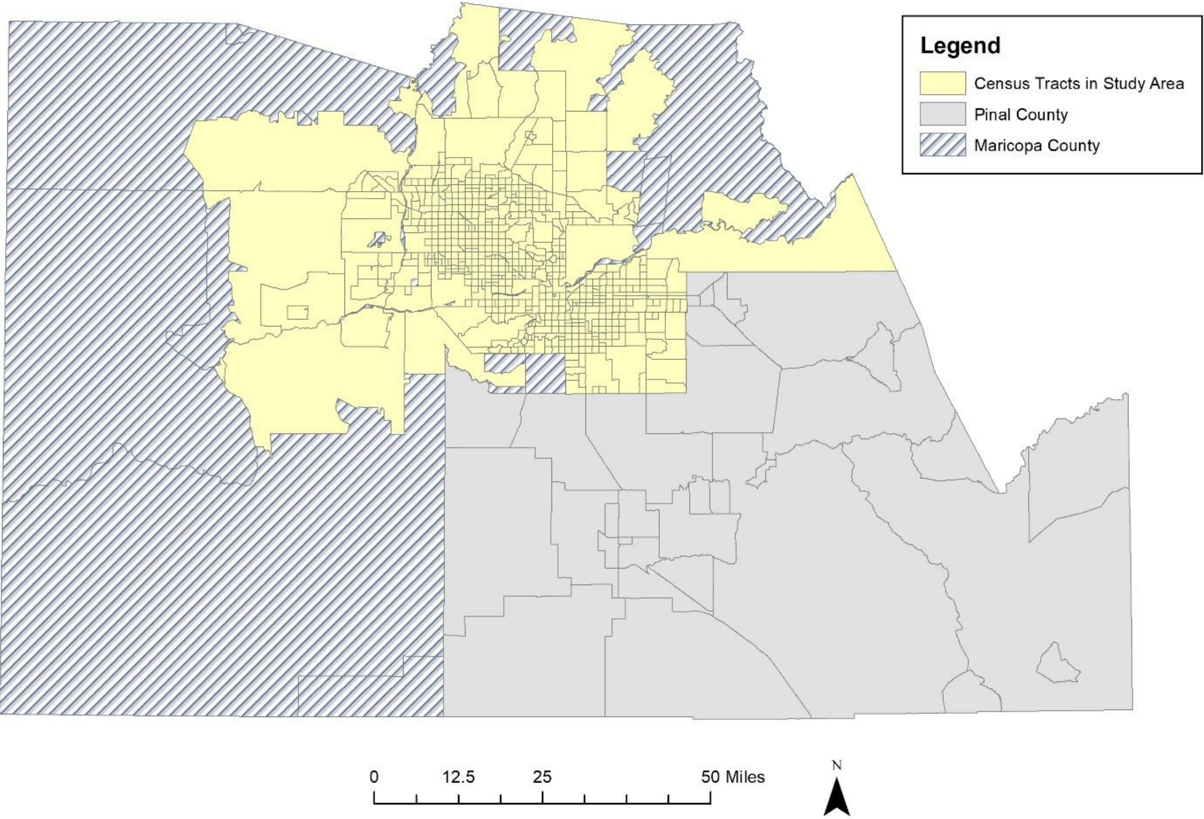
[12] This bounded the *perimeter* of the study area for the organization and children's activity survey described in Chapter 3. However, my boundaries are further restricted to Maricopa County (based on the juvenile offender data) and my *internal* divisions are based on 2000 census tracts to align with the ACS data.

[13] The mean tract size is 5.11 square miles with a range of 0.13 to 494.34. There were seven tracts around the periphery of the metropolitan area that extended far into rural, unpopulated areas. The initial organization study area was generated based on phoneline area codes which do not align precisely with tract boundaries, splicing some of these large tracts to capture the area nearest to the urbanized area. These immense tracts extend into the unpopulated desert zones beyond the urbanized area as shown. The division of these large tracts assumes that all organizations/residents in the tract are in regions nearest to the urban area.

Figure 4-1



Reentering Juvenile Offender Data

My juvenile offender data came from the Juvenile Office of Probation in Maricopa County and are described in detail in the methodology chapter. These data included juveniles (17 or under at the time of completion) who successfully completed their supervision from probation or diversion consequences during 2007 and were at risk to reoffend[14]. These data were deidentified and geocoded to an approximate residential address. For this chapter, I counted the number of juveniles within each tract and used a per capita density measure (juveniles per 1,000 residents) to account for the proportion of the tract population completing juvenile justice supervision in the study year.

Tract Characteristics

To account for neighborhood disadvantage, I used a composite measure comparable to other studies of crime and communities (Hipp et al. 2010; Grunwald et al. 2010; Wallace 2015). I used factor analysis in Stata to generate a composite neighborhood disadvantage variable measure using American Community Survey (ACS) five-year estimates 2005-2009 for: percent unemployed, percent in poverty, percent of female-headed households, percent with no car, percent with different house in past year, and median family income[15]. I also included a squared term of disadvantage since the relationship between disadvantage may be curvilinear (Wo 2016). I accounted for

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[14] One can liken this to a study of released adult parolees who are returning to their communities after release from prison. There is one important distinction to be made between juvenile and adult offending populations. I am not analyzing those juveniles who were involved in juvenile justice systems continually during the study year. There are youth who were in trouble and stayed in trouble during the year either because they had new offenses or were still finishing out their consequences who are not included in my dataset. Some of these juveniles are institutionally housed (e.g., juvenile detention, substance abuse treatment centers, Arizona Department of Corrections), while others remain in the care of their guardians. Thus, when observing the maps that show the distribution of offenders at risk across the metropolitan area, I am restricted to only those offenders who completed successfully.

[15] This factor analysis had a KMO of .812.

population density since organization distribution is likely contingent upon a sufficient number of patrons, clients, students etc. My population density measure was the number of people per square mile, logged to make the regression coefficients more interpretable. I also included measures of percentage of kids ages 10-19, the percentage of residents age 65+, percent black, percent Latino, and percent Native American. There was no problematic multicollinearity based on VIF tests and pairwise Pearson's correlation coefficients. Although percent Latino and the disadvantage score were highly correlated (.6975), I retained them individually to examine the relative influence of each.

Organization Densities

Organizations were collected at the establishment level. For example, all YMCA locations were individually retained even though were all part of the Valley of the Sun YMCA charter. As elaborated in the literature review section, I differentiated seven organization categories that I expect may influence juvenile offender behavior including: public parks, public middle/high schools, libraries/community centers, social services, religious congregations/ministries, civic/voluntary/membership groups, and detention/police stations. In the descriptive statistics table, I report tract counts of establishments in each category, as well as a density measure of number of establishments per 1,000 residents. I also included three combined measures including: 1) the total of all organizations of interest, 2) public parks/public schools (risk enhancers), and 3) all other organizations (risk reducers).

In the spatial regression models predicting organization densities, the dependent variable was a count of the number of establishments in the tract (e.g., schools) per 1,000 residents. The rationale for a density measure is two-fold. First, a density measure based

on population accounts for the potential demand of the resources. The second reason is methodological; spatial regression models require continuous outcome measures rather than counts (Anselin and Rey 2014) [16]. Table 4-1 reports the descriptive statistics for the 652 tracts analyzed in the study area. Tables 4-2 and 4-3 show the pairwise correlation coefficients between measures.

[16] As a robustness check of some of my models, I ran negative binomial Poisson regressions in Stata which are reported later.

Table 4-1. Descriptive Statistics of Census Tract Characteristics N =652

Juvenile Offenders	**Mean or %**	**SD**	**Min**	**Max**	**Variable Metric**
Diversion	10.31	10.23	0	90	# of juveniles ending diversion
Probation	2.46	3.27	0	36	# of juveniles ending probation
All Juveniles	12.78	12.90	0	126	# of juveniles ending supervision
Diversion per 1,000	1.81	1.43	0	16.62	# of diversion/population 2007 x 1,000
Probation per 1,000	0.41	0.49	0	6.02	# of probation/population 2007 x 1,000
All Juveniles per 1,000	2.23	1.73	0	19.39	# of both/population 2007 x 1,000
Census Tract Measures					
Disadvantage Score	0.00	1.79	-4.27	7.80	Composite measure
Disadvantage Squared	3.20	5.78	0	60.79	Square term of disadvantage
Percent Kids	13.63	5.82	0	82	% of tract population age 10-19
Percent 65+	11.81	13.58	0	85.27	% of tract population age 65+
Percent Latino	30.61	25.76	0.2	97	% of tract population Latino
Percent Black	3.96	4.59	0	37.40	% of tract population Black
Percent Native	1.80	4.90	0	89.20	% of tract population Native American
Population Density	8.27	0.93	2.58	10.29	Log of tract population 2007/square miles
Organization Counts					
Public Parks	0.90	1.12	0	9	# of facilities
Public Middle/High Schools	0.52	0.83	0	6	# of facilities
Library/Community Centers	0.09	0.49	0	6	# of facilities
Social Services	3.75	4.58	0	46	# of facilities
Religious	7.23	5.68	0	41	# of facilities
Civic/Voluntary/Membership	7.91	8.35	0	89	# of facilities
Police/Detention	0.07	0.26	0	2	# of facilities
Risk Enhancing Orgs	1.42	1.52	0	11	# of facilities
Risk Reduction Orgs	19.04	15.41	0	144	# of facilities
All Organizations	20.46	16.02	0	147	# of facilities
Each Type per 1,000					
Public Parks	0.19	0.27	0	2.27	# of facilities per 1,000 residents
Public Middle/High Schools	0.10	0.22	0	2.92	# of facilities per 1,000 residents
Library/Community Centers	0.01	0.09	0	1.14	# of facilities per 1,000 residents
Social Services	0.82	1.42	0	16.68	# of facilities per 1,000 residents
Religious	1.46	1.45	0	12.67	# of facilities per 1,000 residents
Civic/Voluntary/Membership	1.67	2.44	0	34.81	# of facilities per 1,000 residents
Police/Detention	0.01	0.07	0	0.75	# of facilities per 1,000 residents
Risk Enhancing Orgs	0.28	0.36	0	3.27	# of facilities per 1,000 residents
Risk Reduction Orgs	3.98	4.47	0	57.29	# of facilities per 1,000 residents
All Organizations	4.27	4.62	0	57.29	# of facilities per 1,000 residents

Table 4-2. Pearson's Correlation Matrix of Census Tract Characteristics and Organization Densities

	Disadv	Disadv^2	%10-19	%65+	%Latino	%Black	%Native	Pop Density	Parks	School	Lib/Center	SocialServ	Religious	Civic	Det/Police
Disadvantage	1														
Disadvantage^2	0.4602*	1													
%10-19	0.1140*	0.1343*	1												
%65+	-0.2564*	-0.0997*	-0.561*	1											
%Latino	0.6975*	0.1886*	0.3027*	-0.3967*	1										
%Black	0.3886*	0.1664*	0.0898*	-0.2342*	0.2642*	1									
%Native	0.2881*	0.1991*	-0.0469	-0.0761	0.0399	0.0886*	1								
Pop Density	0.3029*	-0.1274*	0.1189*	-0.1889*	0.3203*	0.0982*	-0.1469*	1							
Parks	0.1943*	0.2454*	0.1334*	-0.1027*	0.1025*	0.0761	0.0942*	-0.1159*	1						
School	0.1008*	0.0959*	-0.0442	-0.0850*	0.0267	0.0291	0.061	-0.0362	0.1206*	1					
Lib/Center	0.1059*	0.0707	0.0293	-0.0246	0.0541	0.016	0.2716*	-0.0959*	0.2136*	-0.004	1				
SocialServ	0.1594*	0.1519*	-0.2241*	0.0694	-0.0592	0.0293	0.046	-0.0645	0.1419*	0.2441*	0.0654	1			
Religious	0.1831*	0.1903*	-0.0391	0.0679	0.0551	0.0798*	0.0026	-0.1051*	0.2553*	0.4617*	0.1185*	0.5160*	1		
Civic	-0.0119	0.0862*	-0.1882*	0.2094*	-0.2130*	-0.0219	0.0057	-0.2342*	0.1832*	0.1366*	0.0495	0.6797*	0.3945*	1	
Det/Police	0.1267*	0.0597	-0.0168	0.0026	0.0583	0.0057	-0.0116	-0.0562	0.2331*	0.1150*	0.0939*	0.4716*	0.2731*	0.4267*	1

Table 4-3. Pearson's Correlation Matrix of Census Tract Disadvantage, Juveniles per Capita, and Org Densities

	Disadv	Diversion	Probation	Div/Prob	Parks	School	Lib/Center	SocialServ	Religious	Civic	Det/Police
Disadvantage	1										
Diversion	0.4956*	1									
Probation	0.4286*	0.5005*	1								
Div/Prob	0.5316*	0.9695*	0.6973*	1							
Parks	0.1943*	0.1909*	0.1226*	0.1927*	1						
School	0.1008*	0.0448	0.0202	0.0428	0.1206*	1					
Lib/Center	0.1059*	0.0648	0.0719	0.074	0.2136*	-0.004	1				
SocialServ	0.1594*	-0.0895*	-0.0846*	-0.0981*	0.1419*	0.2441*	0.0654	1			
Religious	0.1831*	0.0743	0.033	0.0708	0.2553*	0.4617*	0.1185*	0.5160*	1		
Civic	-0.0119	-0.1827*	-0.0701	-0.1711*	0.1832*	0.1366*	0.0495	0.6797*	0.3945*	1	
Det/Police	0.1267*	-0.001	-0.0084	-0.0032	0.2331*	0.1150*	0.0939*	0.4716*	0.2731*	0.4267*	1

Findings

Descriptive Maps

This tract-level analysis is largely exploratory in nature. Given the spatial nature of the data, a series of descriptive maps is useful to visually examine the distribution of neighborhood disadvantage relative to community organizations and juvenile offenders. The basemaps visualize either standard deviations or Jenks natural breaks, a way to optimize the clustering inherent in the data similar to k-means clustering function in Stata (Dent 1998). The visualization scheme is noted on each map.

The first series of maps examines the distribution of resources, economic and organizational, across the study area. Figure 4-2 maps the composite neighborhood disadvantage scores at the tract level. Areas of greatest disadvantage, shown in dark green, are largely concentrated in the central and south-central areas of the urban metropolis. The one dark region to the southeast is a tract that includes the Phoenix-Mesa airport and residential areas adjacent to the airstrip. Two Native American communities are indicated with an adjacent asterisk. The large boot-shaped tract to the south of the urban center is the Gila River reservation and the Salt River reservation lies to the east. Areas to the north of urban center and to the northeast are the highest income areas of Paradise Valley and Scottsdale. While not shown here, these maps largely mirror the racial divide of the Phoenix-Metro area with the highest concentrations of Latino communities in the center and south-central regions and non-Hispanic white residents concentrated in the less disadvantaged areas. Thus, socioeconomic disadvantage is largely concentrated in the urban core, but not exclusively so as there are a few highly disadvantaged peripheral tracts.

The next set of maps overlay the organizations points on the disadvantage base map. In these maps, tract gradation reflects the disadvantage score, while the point-level data show the geocoded address of the organizational facility. Public schools and parks, shown in Figure 4-3 appear to be well distributed across the urban landscape, as we would expect based on the public organization mandate to serve the school-age and general populations, respectively. In Figure 4-4, there appears to a clustering of community centers near the urban center of Phoenix with fewer establishments in the outlying areas. The next three maps show social services, religious congregations and civic, membership, voluntary organizations separately. There are comparably more of these establishments than the previous types. The central tracts areas characterized by tracts of high socioeconomic disadvantage are not bereft of establishments, rather it is the outlying areas that have fewer establishments.

To account for population, Figure 4-8 displays the number of establishments per 1,000 residents. The general pattern is that areas with the fewer organizations per capita are in periphery rather than the urban core, Sun City to the northwest and Scottsdale to the northeast are notable exceptions. In contrast to the predictions of a de-institutionalization framework, disadvantaged areas do not appear to lack organizations theorized to reduce recidivism. I examine this relationship later using spatial regression models.

Where, then, are reentering juvenile offenders located in the metropolitan area relative to organizations and disadvantage? The next three maps show the tract-level distribution of reentering juvenile offenders who successfully completed probation and diversion in 2007. Figure 4-9 shows that more reentering juvenile offenders are in tracts

to the north, west, and southwest of the urban center than in the northeast and urban core. This does not mean that the center of the city is devoid of youth who are delinquent, bearing in mind that my data do not include those who remain court-involved. Instead, the darkened areas along the periphery are indicative of tracts with reentering juvenile offenders whose time with juvenile justice system is complete.

The next two maps, Figure 4-10 and 4-11 divide out the reentering juvenile offender populations by type of court involvement to see if there are visually discernable spatial differences between youth competing probation and those completing diversion. Although more juveniles completed diversion than probation, the spatial patterning in the maps is comparable between juvenile populations[17]. Figure 4-12 normalizes the counts of offenders by the population in the tract which moves the higher density tracts inward towards the city center. Notably, the northeastern tracts, largely white and affluent, remain relatively devoid of reentering offenders when mapping both the total number and per population distributions, while the Salt River reservation has a high per capita proportion of reentering juvenile offenders, as do some small tracts in the city center.

To better understand the spatial relationship of the reentering juvenile population and the organizational infrastructure, Figure 4-13 features a bold border around tracts that have a high density of organizations (more than 22 per 1,000 residents) which was the top quintile in Figure 4-8. Notably, these tracts are those with fewer juveniles per capita. Figure 4-14 reverses this relationship, tract gradation shows tracts with a high density of organizations per capita and a bold outline illuminates the areas with the most reentering

[17] One tract of note is tract number 116601 which is on southern part of the map just north of Gila River and is darkened in both maps. This tract is 15.6% black, compared to the mean of about 4%. This area to the south and west of the city center encompasses the area of Phoenix known as Laveen Village and Estrella Village, with the towns of Tolleson and Goodyear to the west.

juvenile offenders (> 65 offenders) based on the top quintile classification in Figure 4-9[18]. These maps indicate the north and southwestern tracts where more released juvenile offenders reside have lower establishments per capita of all types compared with more central and northeastern tract, generally. There is also a spatial mismatch between tracts with a higher density of offenders and organization densities which I explore further using spatially weighted regression models.

[18] The six tracts highlighted in map encompass urban villages of Laveen and Estrella Park, the cities Tolleson, Goodyear and Litchfield Park to the south and southwest, north Phoenix (Deer Valley) to the north, and Surprise Arizona. These tracts experienced noteworthy population gains between 2000 and 2010 when tract boundaries change to reflect increase in population. In the ACS 2005-2009 estimate, the population is greater than 20,000 residents for these tracts.

Figure 4-2

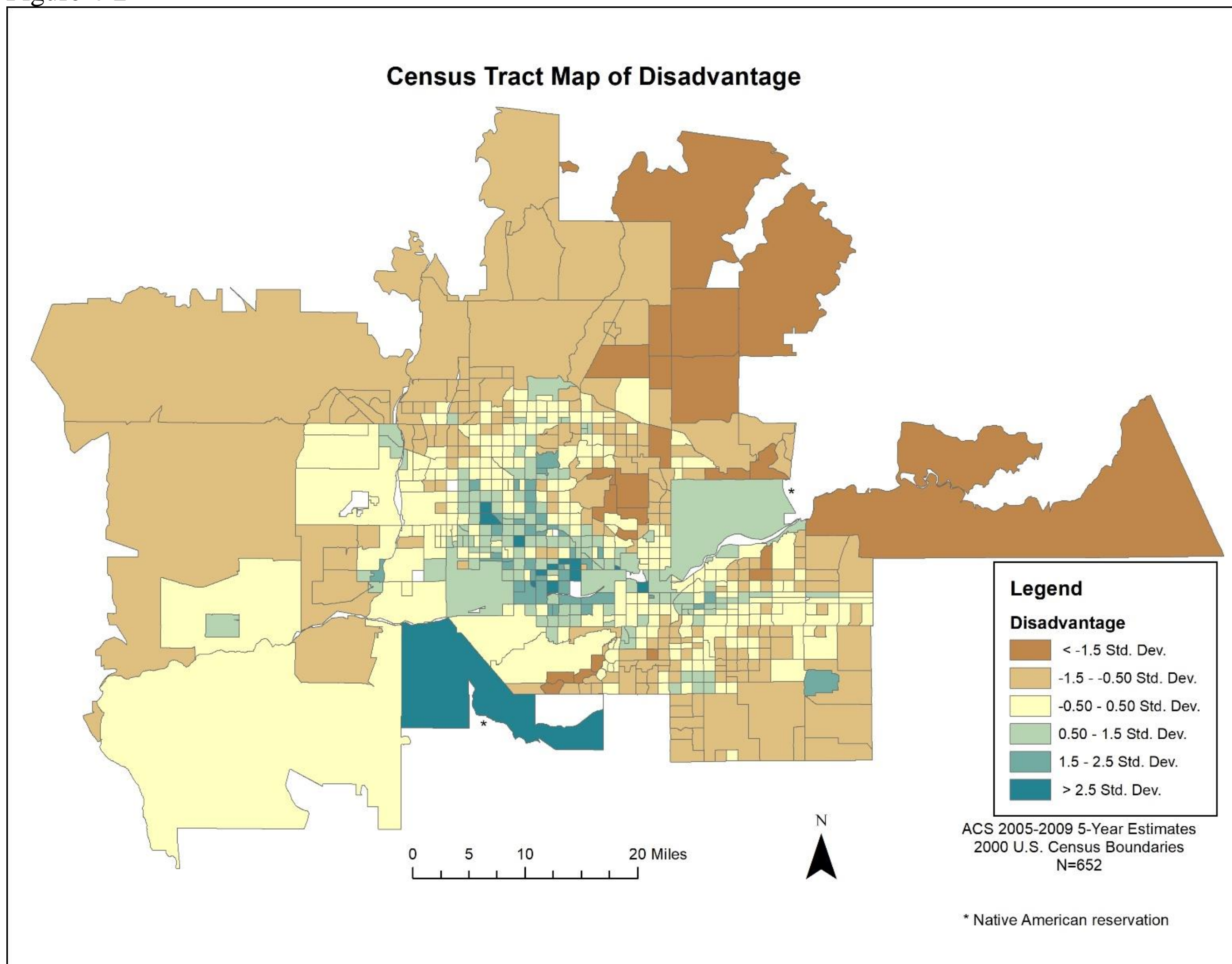


Figure 4-3

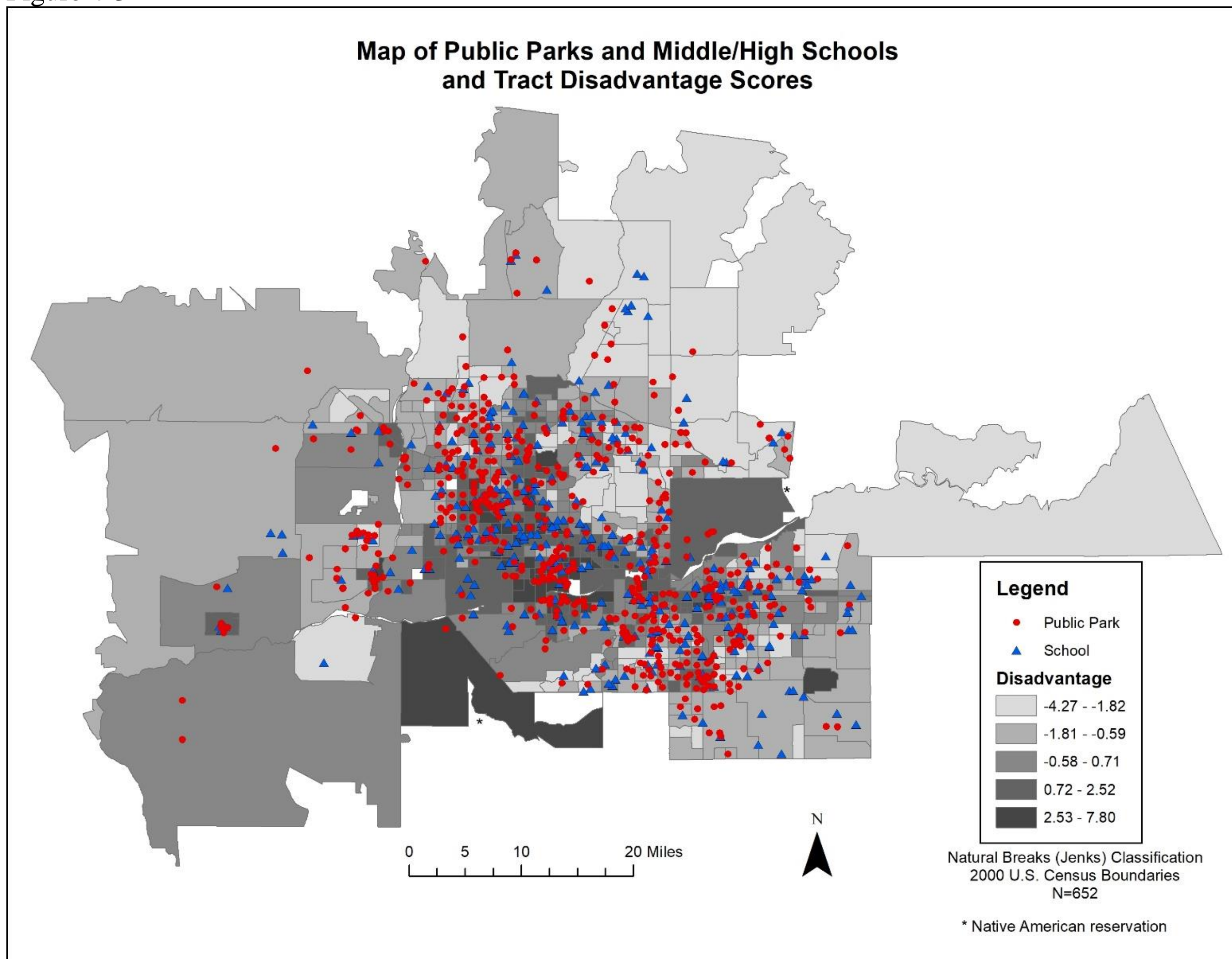


Figure 4-4

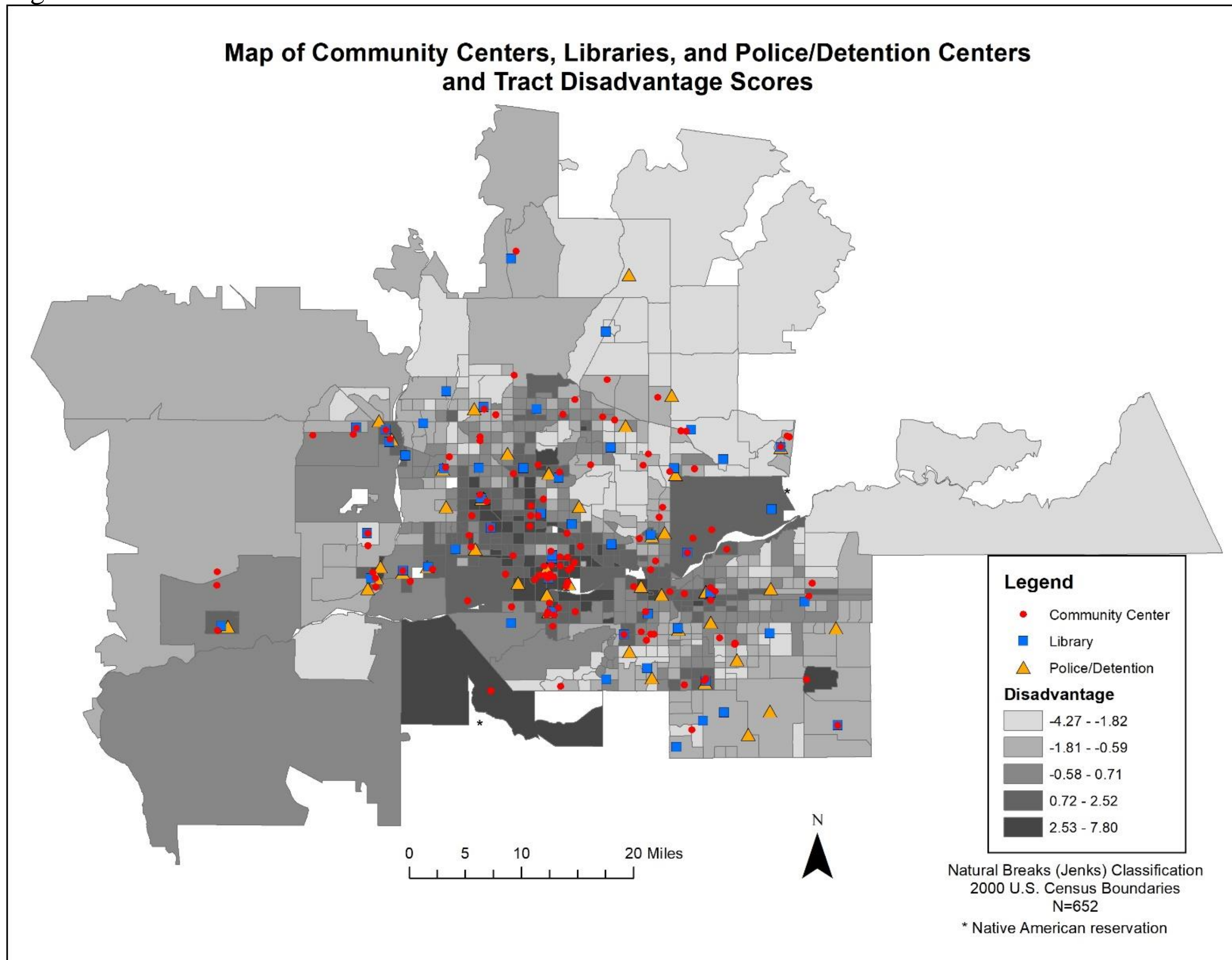


Figure 4-5

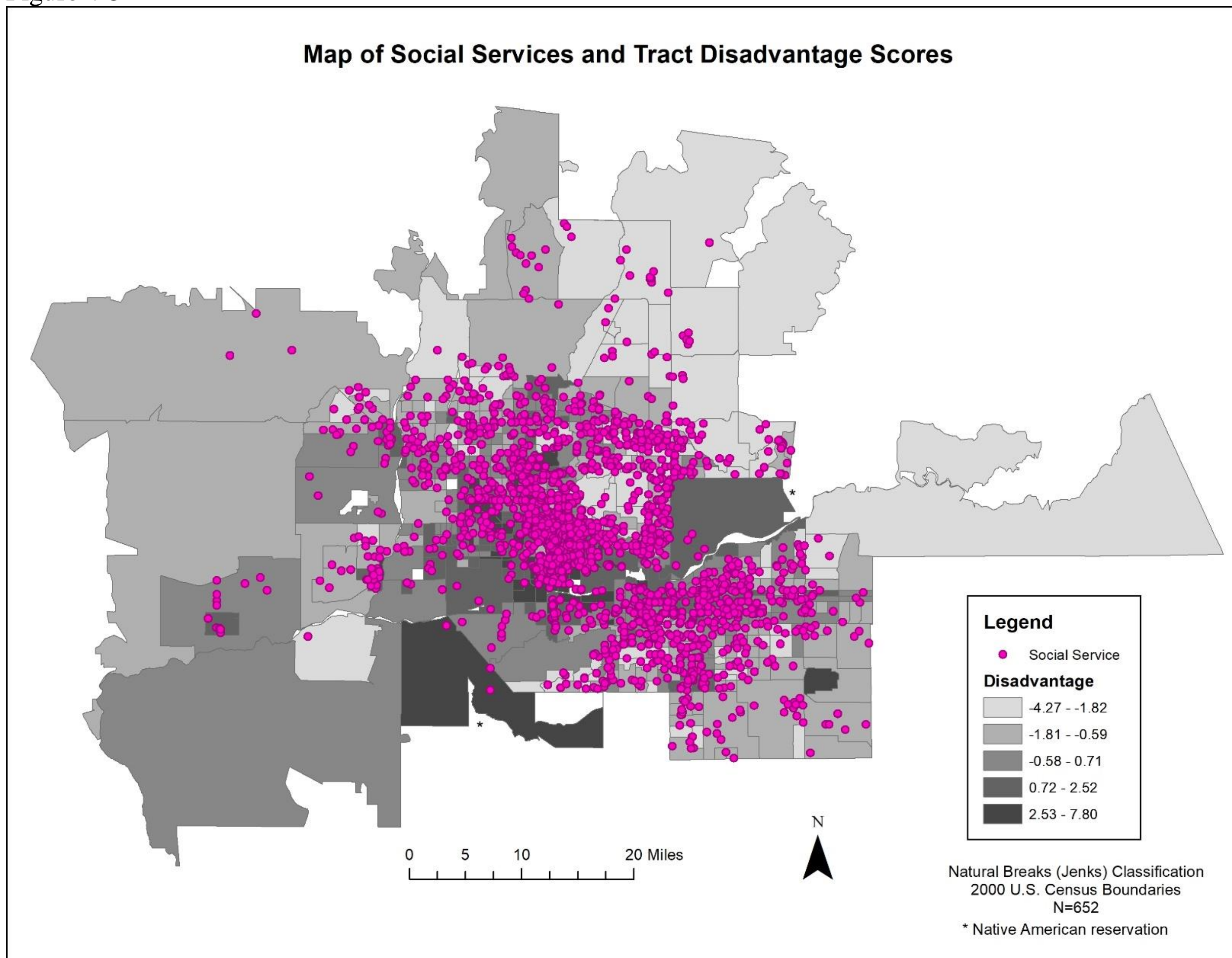


Figure 4-6

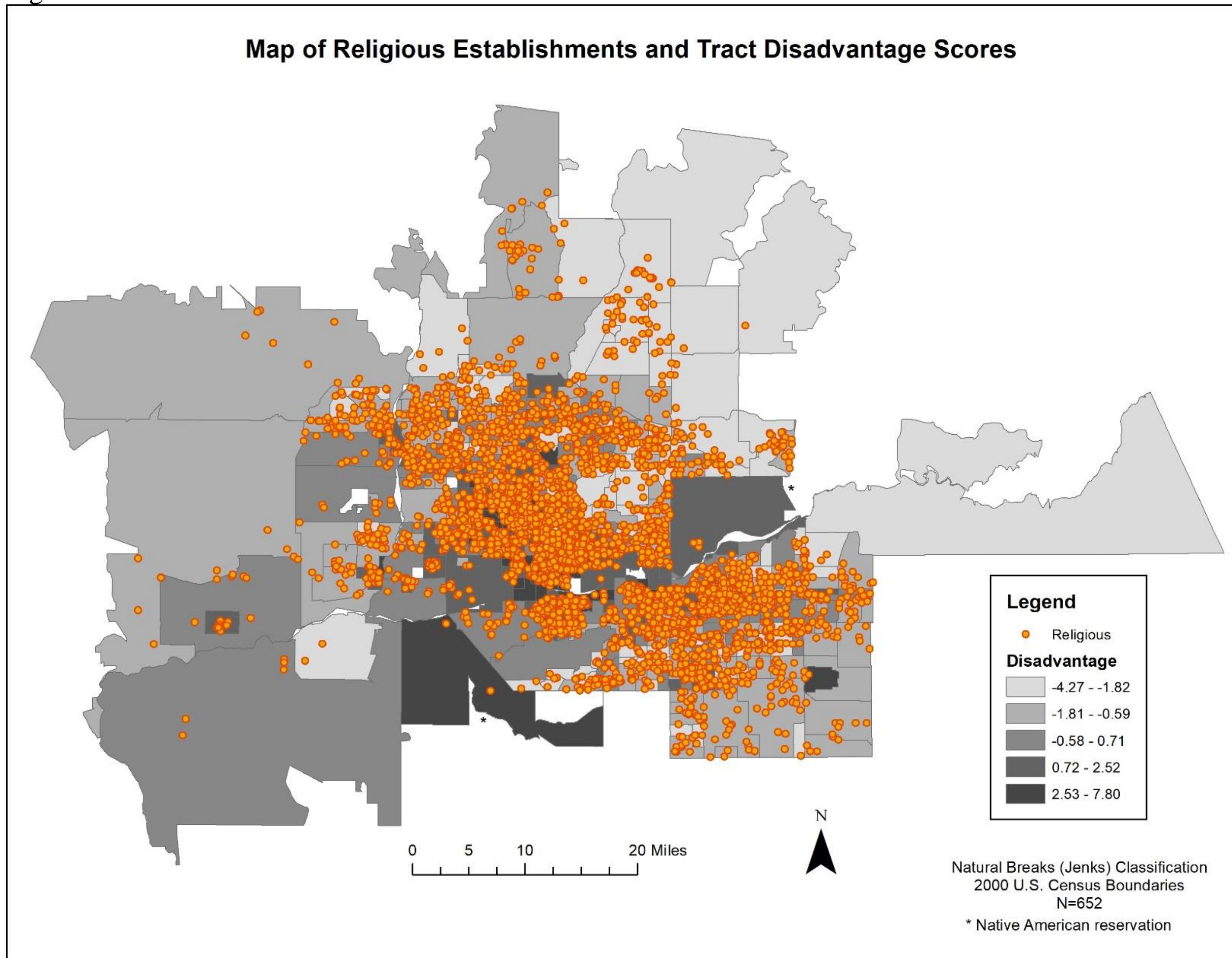


Figure 4-7

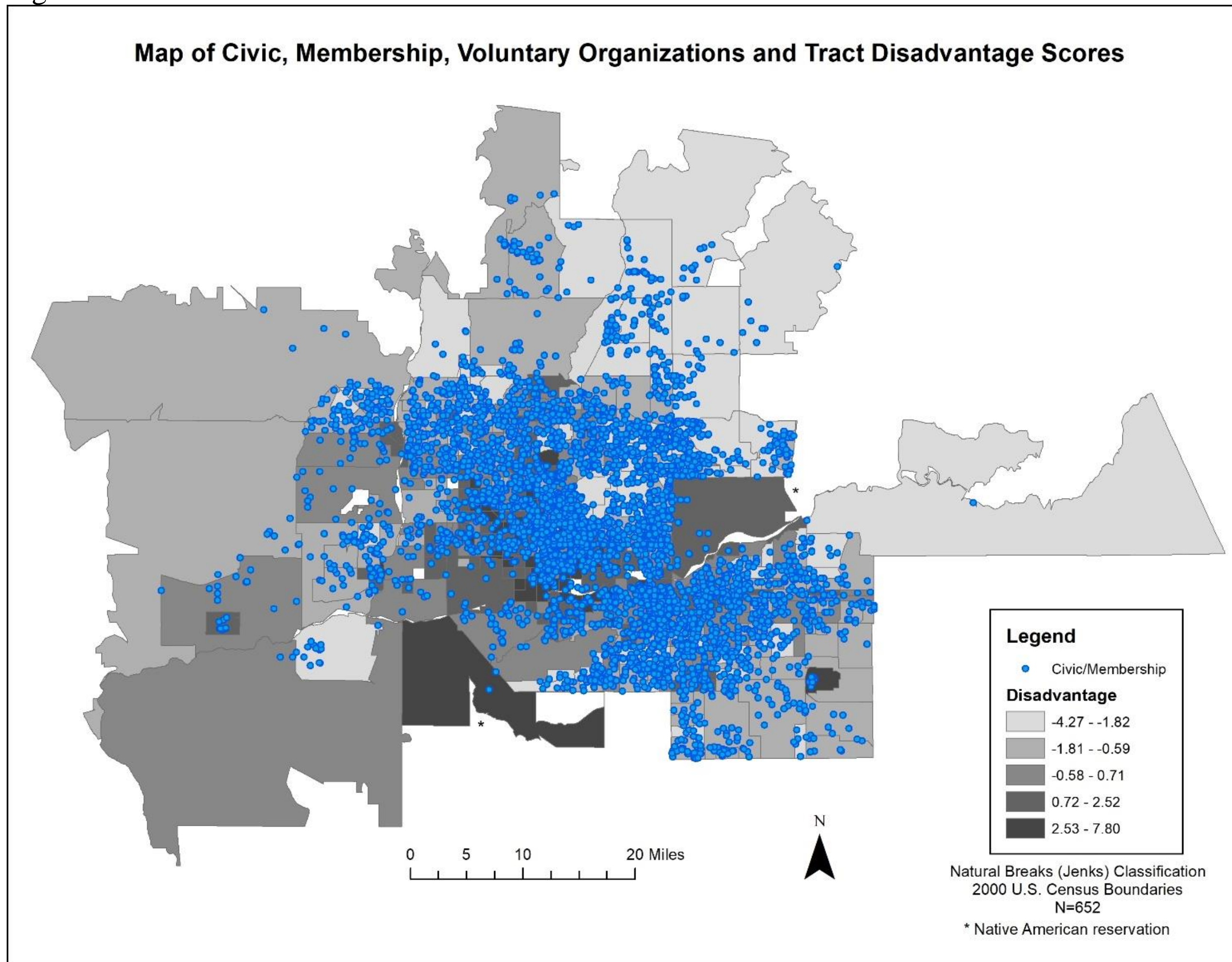


Figure 4-8

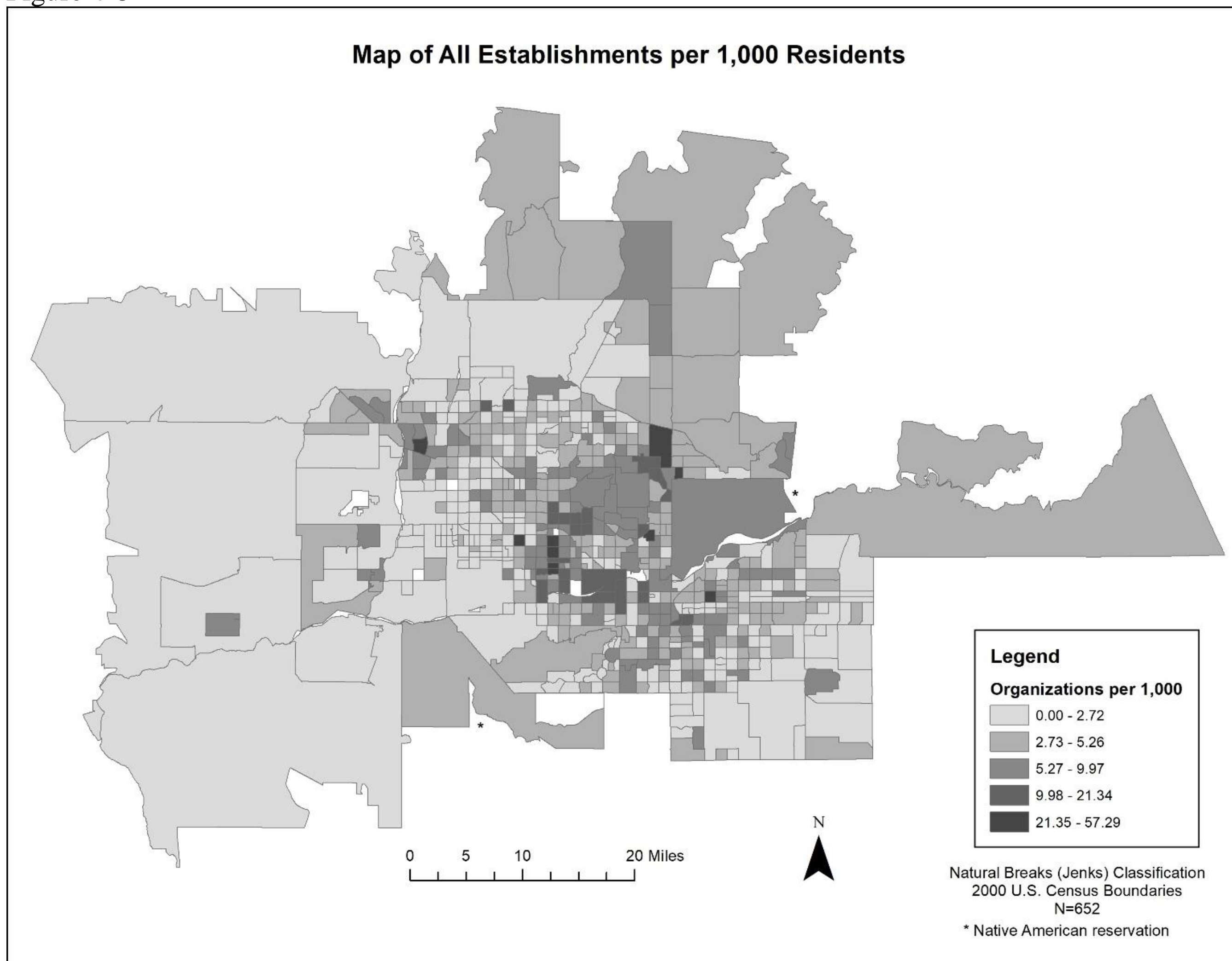


Figure 4-9

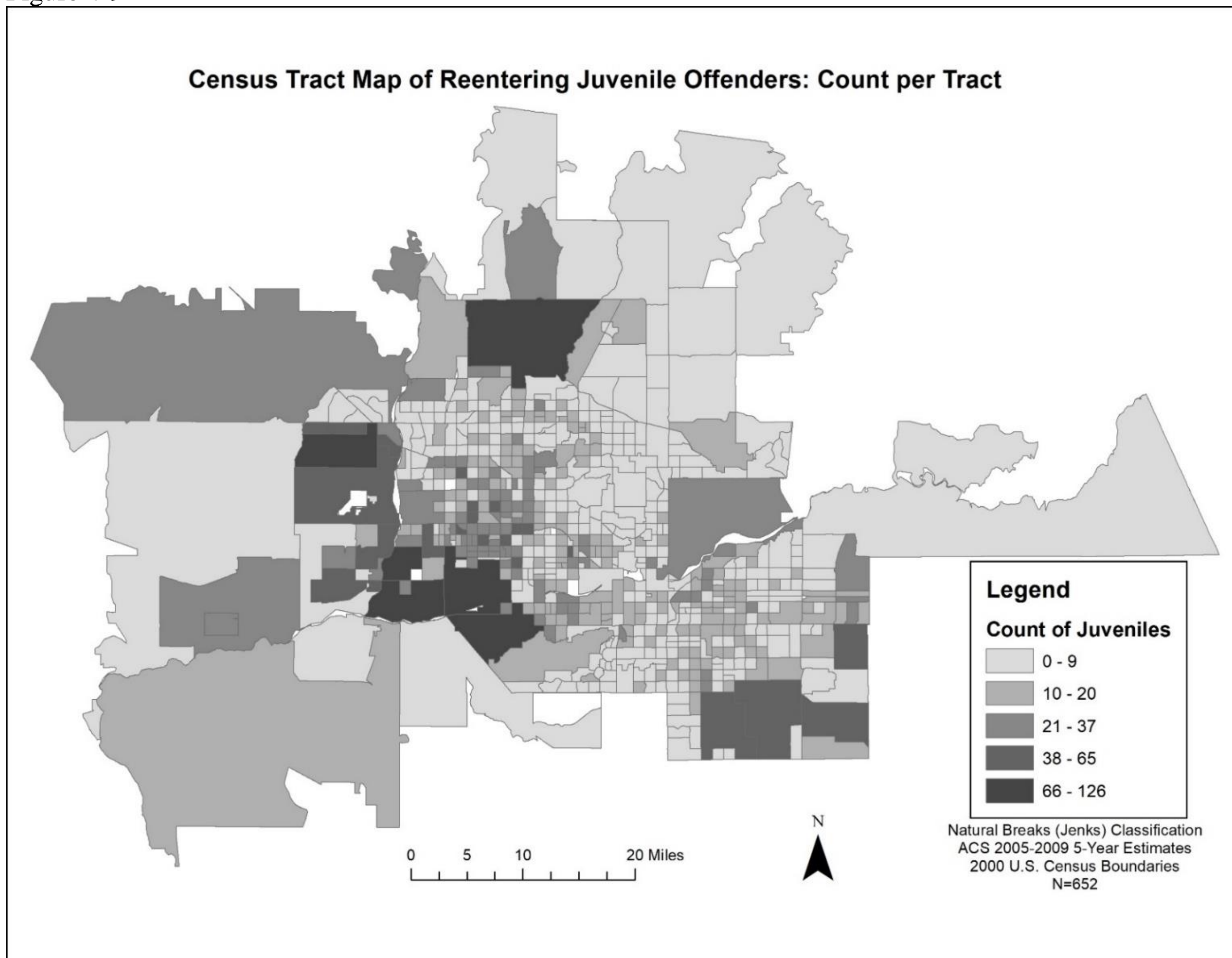


Figure 4-10

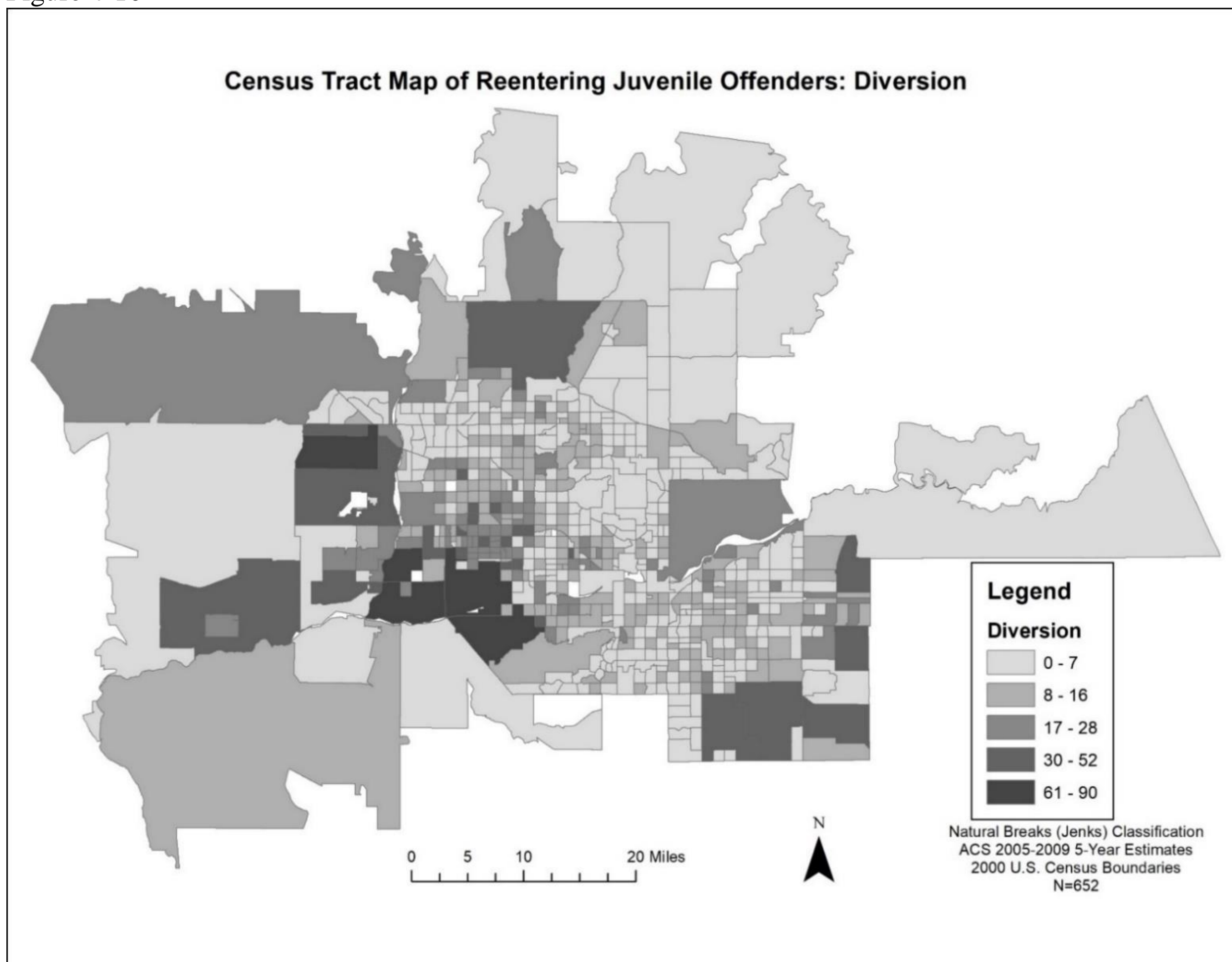


Figure 4-11

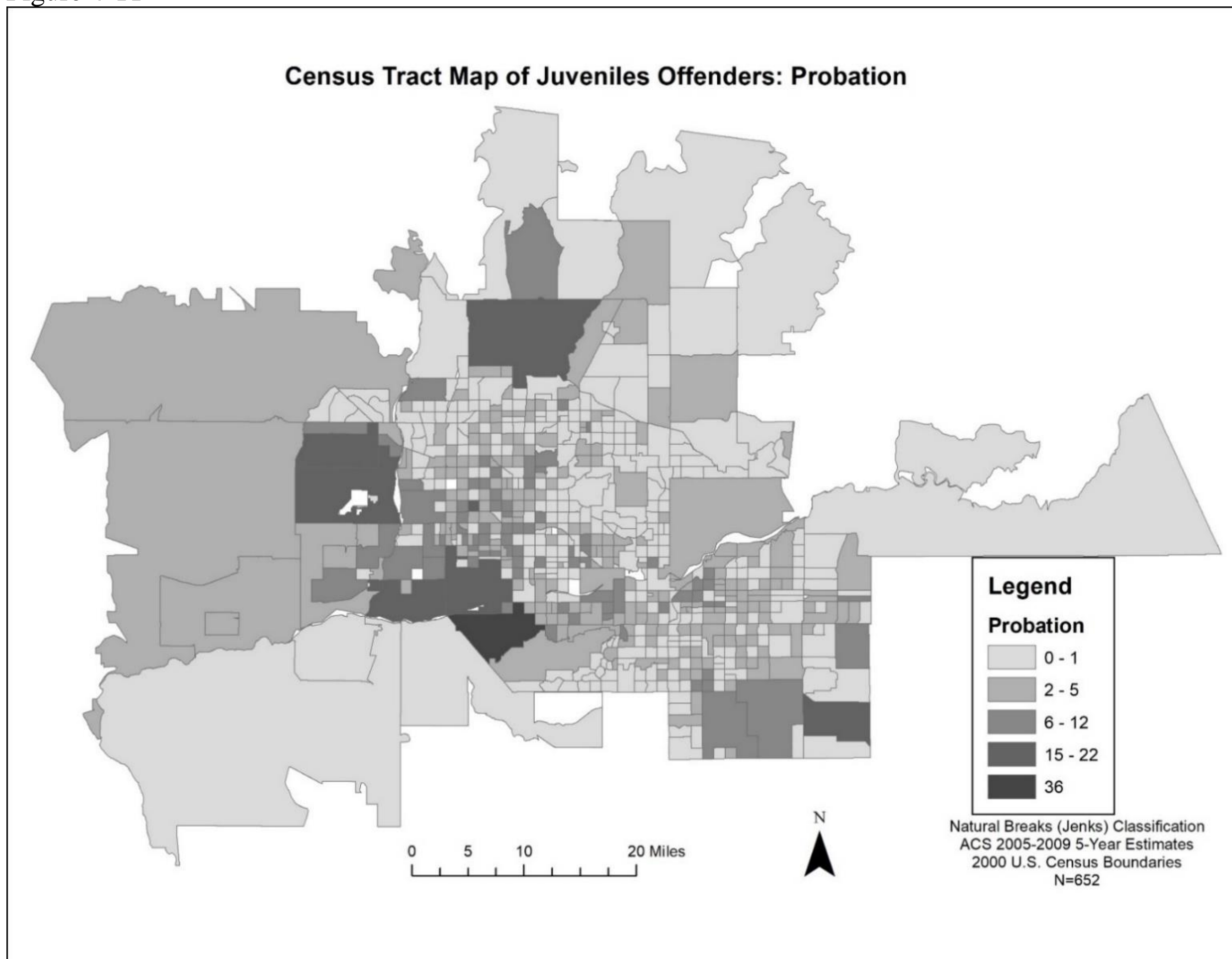


Figure 4-12

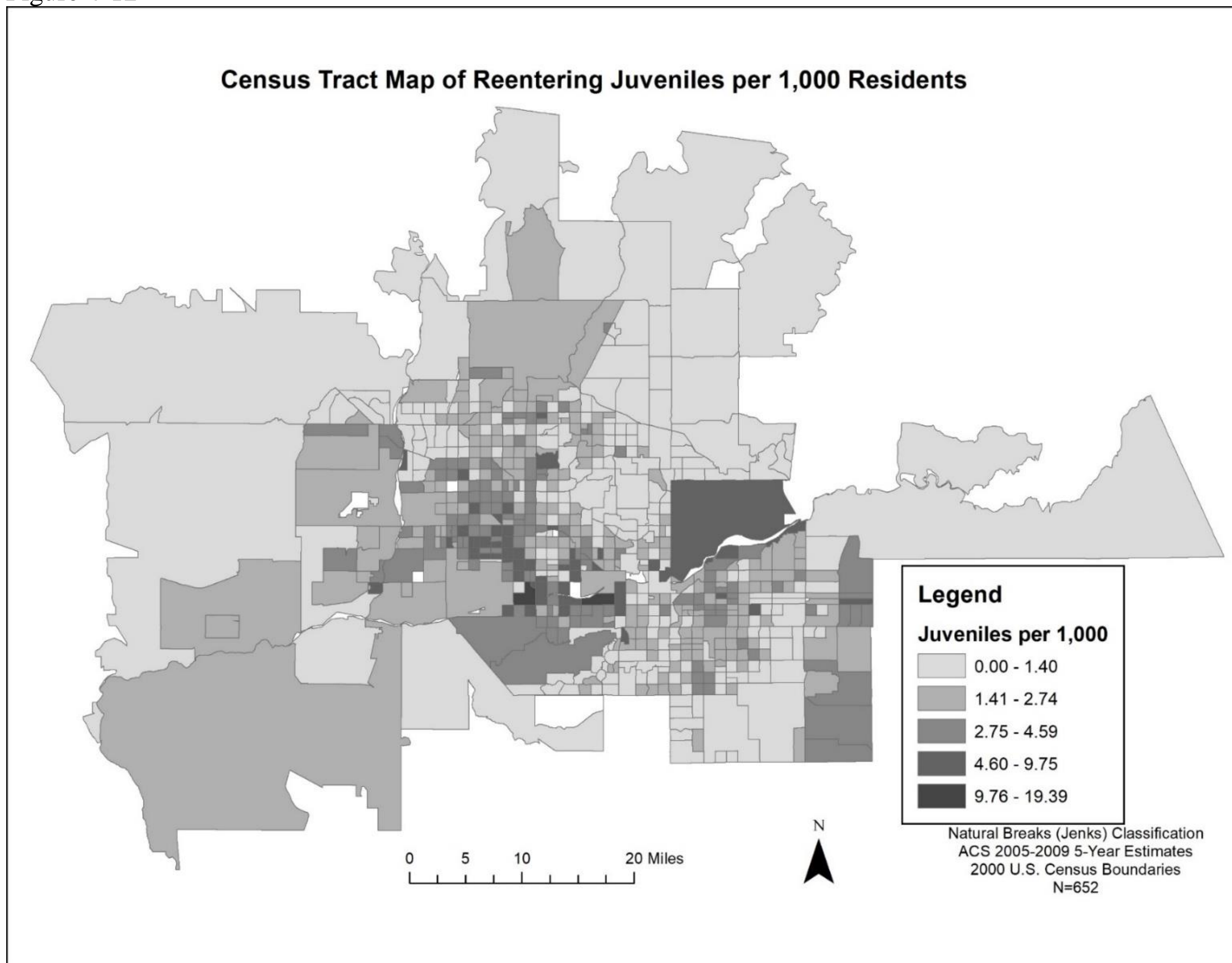


Figure 4-13

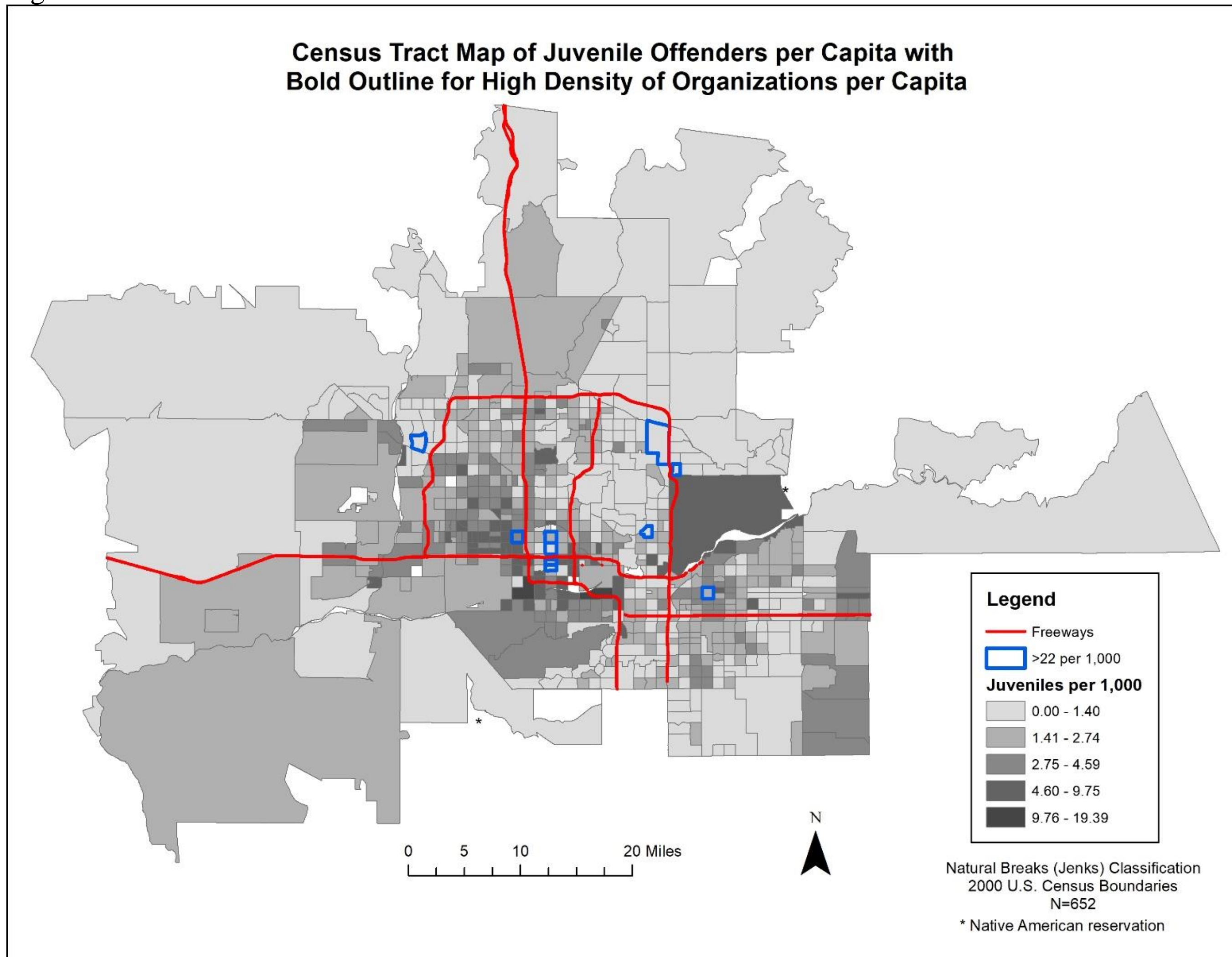
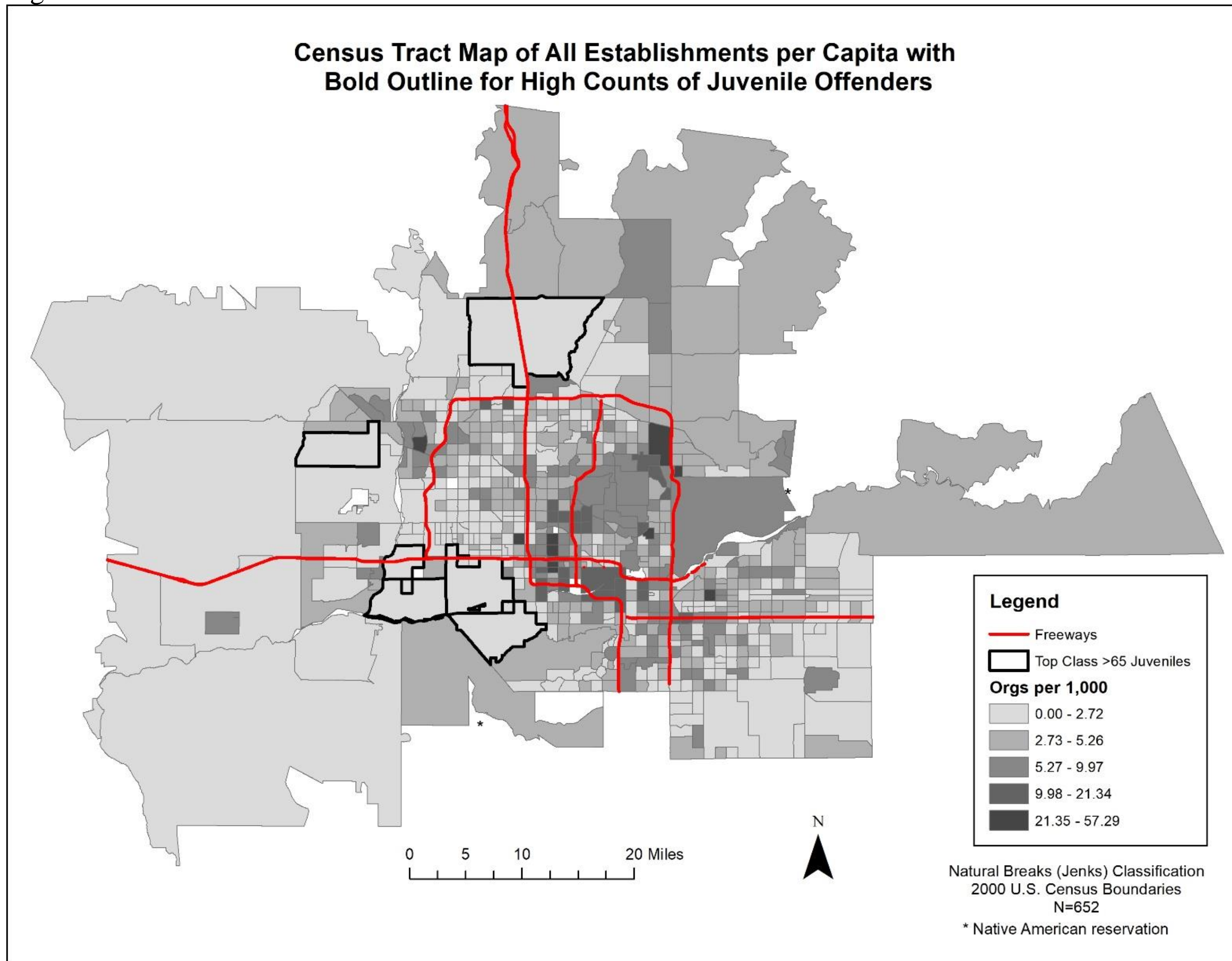


Figure 4-14



Spatially Weighted Regression Models

Next, I ran spatial regression models to illuminate potential statistical relationships between the apparent spatial relationships between tract disadvantage, juvenile offenders at risk, and organizations that appear in the maps. In any study that uses spatial data, it is highly likely that spatially adjacent units violate the assumption of independence necessary in regression analysis which requires testing and accounting for the extent to which included or omitted variables are spatially correlated (Anselin 1988). The of-cited Tobler's First Law is "Everything is related to everything else, but near things are more related than distant things" (Tobler 1970). This is especially true when using an administratively drawn, permeable boundaries such as the census tract where we would expect tract characteristics such as levels of socioeconomic disadvantage and population demographics to carry over between tracts. For each model, I tested and accounted for spatial autocorrelation using Lagrange Multiplier tests as described by Anselin et al. (1996). Spatial autocorrelation, akin to correlation in time-series or nested data, is the extent to which values of a focal tract are influenced by the values of nearby tracts. Spatial autocorrelation may be between variables included in the specified model (e.g., dependent variable or independent variables) which is best accounted for using a spatial lag model, or spatial autocorrelation may come from omitted variables (e.g., unspecified error) which is best accounted for using a spatial error model (Anselin 1988b). A spatial lag model is expressed as

$$y = \rho W y + \beta X + u$$

where y represents the vector of dependent values, β is the vector of coefficients for included explanatory variables X, and u is the unobserved error. The addition of $\rho W y$ to

a linear regression model accounts for the spatial dependence in values of the dependent variables between adjacent tracts where ρ is the parameter for Wy which is the spatially lagged dependent variable using the specified weight matrix, W (Anselin 1988b).

A spatial error model accounts for spatial dependence between the errors expressed the following model:

$$y = \beta X + u$$

$$u = \lambda W u + \varepsilon$$

In this model, λ is the parameter for Wu, using weight matrix W, and ε represents a vector of idiosyncratic errors (Anselin and Rey 2014: 207).

The first step in spatial analysis is to identify the most appropriate weight matrix, *W,* that captures the spatially dependence between units (see Anselin and Rey 2014 for a thorough technical discussion of spatial autocorrelation, weight matrices, and diagnostic tests). A weight matrix is an n x n matrix, W, where W_{ij} is non-zero when *i* and *j* are neighbors. There are various configurations that can be selected to model spatial relationships between the units of analysis which essentially either determine neighbors based on contiguity or distance (Anselin and Rey 2014). Contiguity matrices select neighbors of a focal tract based on shared borders, but this is not appropriate for analyses when there are geographic gaps between spatial units such as islands or, in my study, tracts that are omitted based on limited population. Other matrices can be generated based on a distance function (e.g., all units within one mile of the focal tract are considered neighborhoods) or a specific number of nearby neighborhoods can be selected (e.g., nearest 5 tracts) so that each tract has the same number of specified neighbors (Anselin and Rey 2014).

Once a weight matrix is selected, it is used to generate spatial lag or spatial error terms based on a series of diagnostic tests that account for the spatial autocorrelation between terms. I tested various spatial weight matrices and determined that K-2 nearest neighbor matrix[19] was optimal to maximize Moran's I test of spatial dependence. That is, this configuration of a matrix selects the two nearest tracts to calculate weighted variables. It was the most efficient at capturing the spatial relationship between tract values based on comparing the magnitude and significant of the Moran's I statistic[20]. For each model, I use the LaGrange Multiplier statistics in the spatial analysis software package Geoda to determine whether an OLS, spatial lag or spatial error model was most appropriate to account for spatial autocorrelation (Anselin and Rey 2014: 97-138). Notably, the preferred model type varied by type of organization. I indicate the type of model at the bottom of each table.

Regression Results

Tables 4-4 and 4-5 report findings from spatially weighted least squares regression of organizational density (number of facilities per 1,000 residents) on census tract characteristics for all (Model 1), risk enhancers (Model 2), and risk reducers (Model 3). Table 4-5 differentiates by each of the seven organization types.

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[19] K-nearest neighbor weights are appropriate for accounting for spatial relationships between units when not all spatial units are contiguous. Although most of the census tracts in my study area share borders with neighbors, there are a few areas of non-continuity on the map (e.g., Luke Air Force Base). A k-nearest neighbor approach finds "k" nearest tracts based on the distance from the centroid of the focal tract to the centroid of the nearest two focal tracts (i.e., point-based distance measure rather than shared borders). A Moran's I test is a diagnostic statistic that examines whether spatial autocorrelation is present in the data. I tested K-2, K-3 and K-5 neighbors and determined K-2 was optimal for my analyses.

[20] I ran a univariate Moran's I in Geoda for six key variables in my study [disadvantage, juvenile offenders, social services, religious organizations, percent Latino, percent 10-19]. The magnitude of the statistical test was close across the three types of matrices, with K-2 slightly more advantageous.

Table 4-4. Spatially Weighted Least Squares Regression Models of Organizational Densities per 1,000

	1. All Organizations		2. Risk Enhancing		3. Risk Reducing	
	B	SE	B	SE	B	SE
Constant	15.147***	(3.578)	0.865***	(.214)	14.419***	(3.477)
Disadvantage	1.053***	(.318)	0.048**	(.018)	1.011**	(.120)
Disadvantage^2	0.029	(.047)	0.006	(.004)	0.023	(.313)
Pop Density	-1.085***	(.281)	-0.065**	(.022)	-1.023***	(.045)
Percent Black	-0.018	(.052)	-0.003	(.003)	-0.016	(.270)
Percent Latino	-0.049***	(.014)	-0.001	(.001)	-0.048***	(.050)
Percent Native	-0.108*	(.053)	-0.000	(.006)	-0.108**	(.014)
Percent 10-19	-0.069	(.068)	0.001	(.003)	-0.071*	(.049)
Percent 65+	0.009	(.020)	-0.003*	(.001)	0.012	(.066)
W*All Orgs	0.140	(.123)				
W*Risk Reducing Orgs					0.127	(.020)
Lambda			0.116†	(.065)		
Pseudo R^2	0.209		0.098		0.200	
N =	652		652		652	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001.
White Standard Errors, Spatial Lag Models 1 and 3, Spatial Error Model 2

Table 4-5. Spatially Weighted Least Squares Regression Models of Organizational Densities per 1,000 by Subgroup

	1. Parks		2. Schools		3. Lib/Center		4. Social Service		5. Religious		6. Civic/Volun		7. Detent/Police	
	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	0.509***	(.148)	0.340*	(.136)	0.060	(.044)	3.217***	(.957)	3.534***	(1.012)	8.424***	(1.019)	0.121*	(.052)
Disadvantage	0.029**	(.010)	0.017	(.013)	0.003	(.003)	0.283**	(.096)	0.248***	(.084)	0.453***	(.093)	0.012*	(.005)
Disadvantage^2	0.004	(.004)	0.002	(.003)	-0.000	(.001)	0.012	(.016)	0.017	.(.019)	-0.011	(.018)	-0.001	(.001)
					-						-			
Pop Density	-0.048**	(.017)	-0.015	(.011)	0.008†	(.005)	-0.164*	(.071)	-0.256**	(.089)	.0.690***	(.112)	0.011*	(.004)
Percent Black	-0.001	(.003)	-0.002	(.002)	-0.000	(.001)	-0.012	(.015)	0.005	(.017)	-0.007	(.021)	-0.001	(.001)
Percent Latino	0.000	(.001)	-0.001	(.001)	0.000	(.000)	-0.013*	(.004)	-0.005	(.004)	-0.031***	(.006)	-0.000	(.000)
Percent Native	0.001	(.004)	-0.000	(.003)	0.005	(.004)	-0.026†	(.013)	-0.034**	(.012)	-0.058**	(.020)	-0.001**	(.001)
Percent 10-19	0.006*	(.002)	-0.005	(.003)	0.001	(.001)	-0.049*	(.019)	0.001	(.020)	-0.011	(.019)	-0.000	(.001)
Percent 65+	-0.000	(.001)	-0.003**	(.001)	0.000	(.000)	-0.009†	(.005)	0.009†	(.005)	0.017†	(.009)	-0.000	(.000)
Lambda	0.177***	(.053)									0.234***	(.034)		
W*SocialServ							0.240*	(.117)						
W*Religious									0.040	(.226)				
Adjusted or Pseudo R^2	0.099		0.025		0.073		0.199		0.097		0.143		0.0265	
Model N=652	Spatial error, KP S.E.		OLS, White S.E.		OLS, White SE,		Spatial lag, White S.E.		Spatial lag, White S.E.		Spatial error, KP S.E.		OLS, White S.E.	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001.

In contrast to the predictions of a classic social disorganization framework, socioeconomic disadvantage was associated with a higher density of organizations per capita rather than a lower density of organizations for aggregate categories as shown in Table 4-4. Across the metropolitan area, the per capita distribution of risk enhancers (schools/parks) and risk reducer organizations were positively associated with neighborhood disadvantage scores. A squared term testing for a curvilinear relationship with disadvantage was not statistically significant, in contrast to recent findings on non-profit densities in Los Angeles by Wo (2018). The proportion of black residents was unrelated to organizational distribution, however, neighborhoods with a higher percentage of Latino residents, Native American residents, and youth ages 10-19 had fewer risk reducing organizations per capita (Table 4-4, Model 3). Population density was inversely related to organizational densities across the three models.

The positive association between disadvantage and organizational densities held for five of the seven categories in Table 4-5 when I differentiated by subgroup of organization. The two exceptions (Models 2 and 3 in Table 4-5) indicated that school and library/community center densities were unrelated to disadvantage. Only one measure for percent of the population age 65+ was significant and negatively related to school density, not surprisingly. Other measures were not significant, suggesting a distribution across the metropolitan area that is not differentiated by race, class, or age, which aligns with previous findings by Galaskiewicz et al. (2016).

For all other organizations, there was a positive association between disadvantage and organization densities as shown in Table 5. This was particularly strong for social services, religious establishments, and civic/voluntary/membership organizations. There

are more of these types of organizations per capita in areas more disadvantaged neighborhoods. A statistically significant spatial lag term for social services indicated clustering; the density of social service agencies in adjacent tracts was associated with the presence of social services in a focal tract.

Racial composition of the census tract was predictive of organizational densities. Percent Latino was negatively associated with both the density of social services and density of civic/voluntary. Percent Native was also negatively associated with social service, religious, civic/voluntary, and detention/police densities. Population density was negative and statistically significant in predicting the density of parks, social services, religious establishments, and civic/voluntary/membership organizations indicating that higher number of people per square mile is associated with fewer organizations per capita. In contrast, population density was positively associated with the per capita distribution of detention/police facilities. The population density measure may reflect the zoning of highly residential areas as distinct from commercial areas which is one distinctive feature of the growth history of the Phoenix-metro area.

Reentering Juvenile Offenders

Where, then, are establishments located in relation to the reentering juvenile offender population? From the series of descriptive maps, it appears that more released youth reside in peripheral tracts with relatively low levels of disadvantage. The potential association between organizations per capita and released juvenile offenders is less clear. Figures 4-12 and 4-13 appear to show that tracts with more released juvenile offenders are also those with comparably fewer establishments per capita. For spatial analysis, I utilize a dependent variable of density to account for the distribution of reentering

offenders as a proportion of the tract population (number of reentering juvenile offenders per 1,000).

Models 1-5 in Table 4-6 report the spatially weighted regression models of all reentering juveniles/1,000 residents accounting for neighborhood disadvantage, tract characteristics, and the total number of organizations per tract. I used aggregate categories for the organizations based on direction of influence and ran spatial error models with Kelejian-Prucha standard errors as indicated by diagnostic tests (Kelejian and Prucha 2010).

Table 4-6. Spatially Weighted Least Squares Regression Models of Reentering Juveniles per 1,000 Residents

	1. Disadvantage		2. Tract Measures		3. All Orgs		4. Parks/Schools		5. Other Types	
	B	SE	B	SE	B	SE	B	SE	B	SE
Constant	2.221***	(.077)	2.303†	(1.222)	2.667*	(1.346)	2.127	(1.336)	2.693*	(1.333)
Disadvantage	0.467***	(.058)	0.137†	(.073)	0.153*	(.076)	0.131†	(.075)	0.154*	(.075)
Disadvantage^2			-0.014	(.017)	-0.015	(016)	-0.013	(.017)	-0.015	(.016)
Pop Density			-.211	(.156)	-0.235	(.162)	-0.197	(.165)	-0.236	(.161)
Percent Black			0.017	(.021)	0.017	(.021)	0.018	(.021)	0.017	(.021)
Percent Latino			0.039***	(.004)	0.038***	(.004)	0.039***	(.004)	0.038***	(.004)
Percent Native			0.012	(.023)	0.010	(.025)	0.012	(.023)	0.010	(.025)
Percent 10-19			0.035	(.025)	0.035	(.024)	0.033	(.025)	0.034	(.024)
Percent 65+			-0.003	(.005)	-0.003	(.005)	-0.003	(.005)	-0.003	(.005)
Count of All Orgs					-0.007*	(.014)				
Parks/Schools (>Risk)							0.044	(.040)		
Other Orgs (<Risk)									-0.008*	(.003)
Lambda	0.272***	(.061)	0.098	(.060)	0.081	(0.059)	0.109†	(.060)	0.080	(0.060)
Pseudo R^2	0.283		0.499		0.504		0.500		0.505	
N =	652									
Notes	: † p<.10, * p <.05, **p <.01, *** p<.001. Spatial Error, K.P. S.E.									

Findings reported in Table 4-6 indicate that socioeconomic disadvantage and percent Latino were positively associated with the density of reentering juvenile offenders (Models 2-5). Models 3-5 include measures of the aggregate organization categories and indicate there are fewer risk reducing organizations in tracts with a higher density of juvenile offenders. This finding supports the apparent patterns in the descriptive maps. The number of parks/schools in a tract was unrelated to the density of juvenile offenders per capita (Model 4). The main finding from these models was that census tracts with greater socioeconomic disadvantage, more Latino residents were associated with more reentering juvenile offenders per capita[21]. The number of organizations theorized to reduce recidivism risk (Model 5) was negatively associated with the density of juvenile offenders, but modestly so in comparison to the effect of disadvantage and percent Latino.

It seems that there are some tracts that are both socioeconomically disadvantaged *and* have fewer organizations and more juveniles per capita. To make sense of this seemingly contradictory result, I made an additional map to examine tracts with high densities of organizations, high densities of juvenile offenders and the neighborhood disadvantage score using standard deviation distribution. Figure 4-15 maps the entire study area and Figure 4-16 shows a large scale view of the urban core with major

[21] As a robustness check, I ran negative binomial Poisson regressions in Stata using a count dependent variable of reentering juvenile offenders rather than the ratio of per capita measure used above. Negative binomial Poisson models are the best way to run models of count dependent variables with overdispersion, that is, when the variance is greater or equal to the mean (Lambert, Brown and Florax 2010). My mean number of juveniles was 12.78 per tract with a standard deviation of 12.9. The findings were largely consistent with my spatially weighted model. The only exception was that the squared term for disadvantage, which was not statistically significant in my spatial models, was negative indicating a potential curvilinear relationship. Disadvantage increased the density of reentering juvenile offenders to a point. Intuitively, this makes sense considering my population is not all juvenile offenders, but rather those who have successfully completed their supervision.

freeways. Tracts outlined in red have a high density of juvenile offenders (1 standard deviation over the mean or more per 1,000 residents) while the tracts outlined in blue have a high density of organizations (more than 22 per residents). None of these outlined tracts overlapped. The base map of disadvantage is based on standard deviations from the mean. The two tracts representing Native American reservation communities are noteworthy. The Gila River community to the south is a highly disadvantaged tract, but with few juvenile offenders or organizations. In contrast, the Salt River community is characterized by a high per capita density of kids, higher than average disadvantage, and about less than half of the mean number of organizations per person (9.48). As a robustness test, I reran the models predicting organizational densities and juvenile offender densities without these two tracts, but the main findings remained unchanged[22].

The larger scale map in Figure 4-16 sheds light on the spatial patterns near the center of the urban area. There are a few tracts with a high density of organizations in this area, that are also characterized by high levels of disadvantage. However, many of the tracts with high densities of reentering youthful offenders per capita are in modest neighborhoods characterized by moderate to high levels of disadvantage. A few of these tracts are divided by major freeways, which provides easy access for families with able transportation but likely restricts the walkable access of resources across the tract and to adjacent areas. Comparing this map with the per capita densities of organizations show in Figure 4-8 suggests that many, but not all these tracts have few organizational resources per 1,000 residents.

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[22] Percent Native American was reduced to non-significance in one model, but the direction of influence for all other measures were consistent.

Figure 4-15

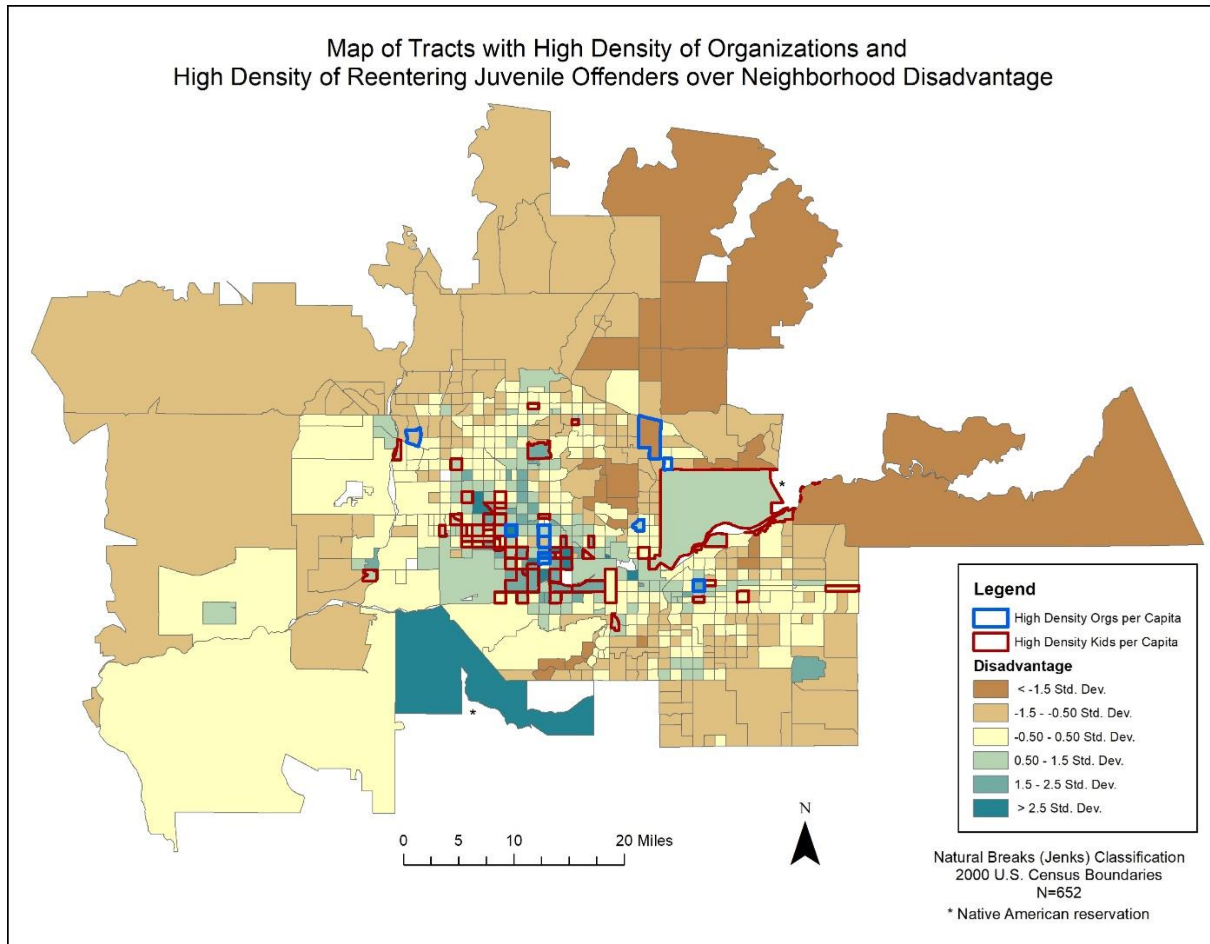
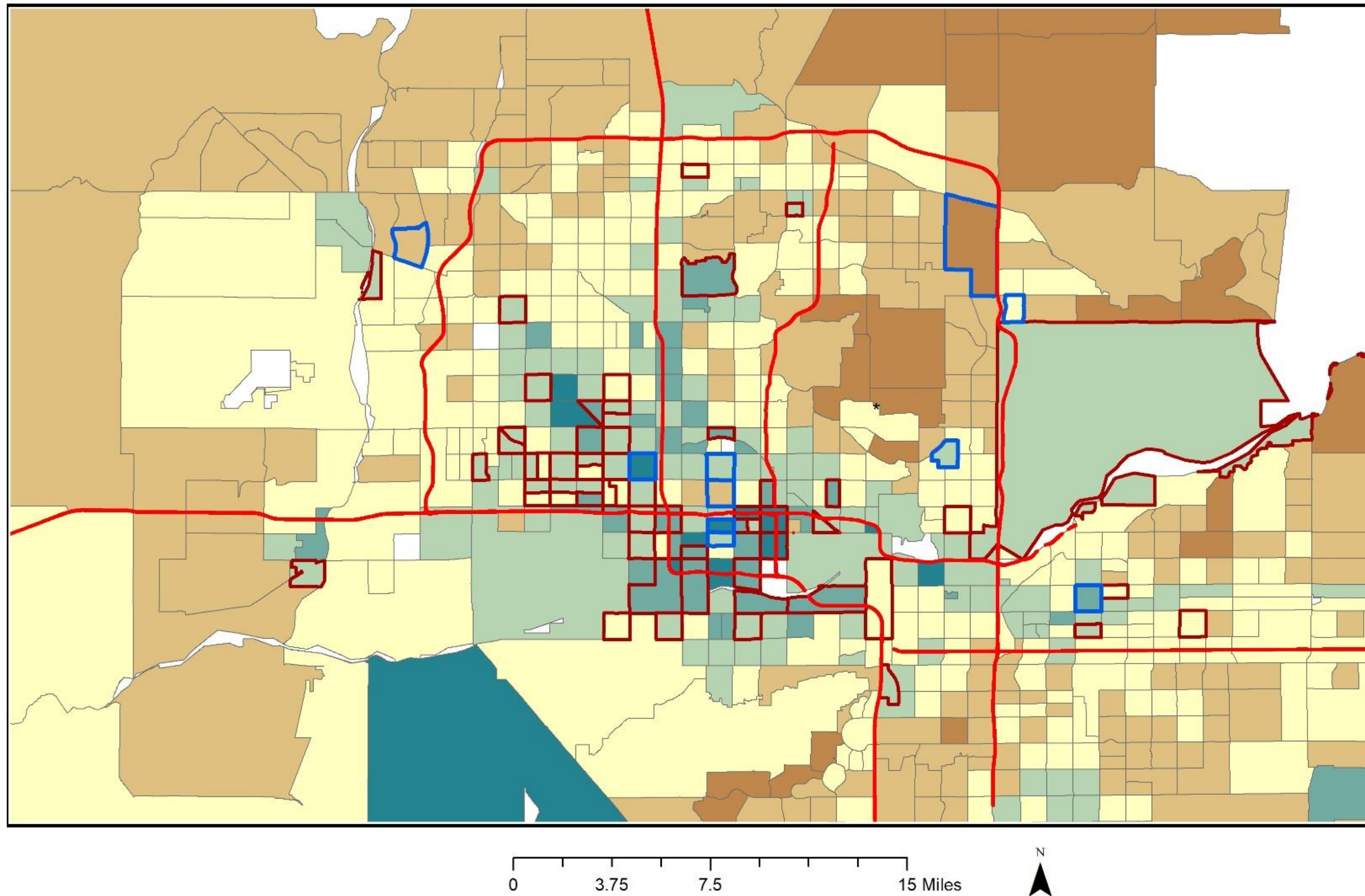


Figure 4-16

Large Scale Map of Tracts with High Density of Organizations and
High Density of Reentering Juvenile Offenders over Neighborhood Disadvantage with Major Freeways



In summary, the key findings from this chapter are:

1. Disadvantage was positively associated with organizational densities at the tract-level for parks, social services, religious congregations/ministries, civic/voluntary/membership organizations, and juvenile detention/police stations.
2. Disadvantage was unrelated to the distribution of non-elementary schools and libraries/community centers.
3. Percent Latino, percent Native American, and percent kids were negatively associated with the density of organizations theorized to reduce risk among reentering juvenile offenders.
4. There was a higher density of reentering juvenile offenders per capita in areas of greater socioeconomic disadvantage, a higher percentage of Latino residents, and overall *fewer organizations theorized to reduce risk*, controlling for other tract demographic characteristics.

Discussion/Conclusion

A classic social disorganization perspective would expect that areas of high socioeconomic disadvantage would be associated with a lower density of valued community organizations. In contrast, findings from this study indicate the opposite for a subset of organizations. In the greater Phoenix-metro during the peak economy of 2007 just before the Great Recession, tract disadvantage, which accounted for both residential mobility and percent of residents in poverty was either not statistically significant or was positively associated with the density of organizations. Disadvantage was positively associated with the density of social services, religious, civic/voluntary/membership organizations, and detention/police centers. Maps of the area showed that these tracts

with more establishments per capita were centralized in the urban core in both disadvantaged and affluent neighborhoods. Peck (2008) also found that non-profit organizations focused on alleviating poverty were located in more impoverished areas in of Phoenix between 1990-2000. Notably, suburban regions to the north and southwest of the urban center, had tracts that had many reentering juvenile offenders and fewer organizational resources per capita which aligns with work identifying suburbs as areas of growing need (Allard 2017).

Figure 4-13 showed that more juvenile offenders, using raw counts, were in tracts that were not the most economically impoverished nor were they exceptionally affluent. These were large peripheral tracts to the north, west, and southwest of the metropolitan area. However, they had notably fewer community establishments per capita that facilitate social control. There was tremendous residential growth in these suburbs and exurbs between 2000-2010. These outlying areas were first converted from desert or agricultural land to residential homes (e.g., model home communities a commonplace entity in Arizona). People move first to inhabit new home construction, and then retail and food establishments, then organizations for community-building. Or these areas are designed to be residential retreats/inclusive communities intentionally segregated from organizations. It is not clear why these areas had more reentering juvenile offenders, perhaps simply a function of the population. Overtime data could elucidate these patterns of growth and decline which is a promising next step to disentangle the temporal patterns. At the time of this study, community institutions such as community centers, social service agencies, religious establishments, and membership/civic/social organizations were fewer per capita in areas with a greater number of reentering juvenile offenders.

The idea that aggregate levels of community institutions influence crime and delinquency finds support in the recent article by Sharkey, Torrats-Espinosa, and Takyar (2017). They reported that an increase in community non-profits contributed, in part, to crime decline from 1990-2010 across 264 cities in the U.S. Similarly, neighborhood disinvestment such as foreclosures on investor-owned properties particularly during the housing crisis in 2008, has been linked to increases in short-term property crime rates in suburban Phoenix neighborhoods (Chamberlain et al. 2018). These findings, coupled with the analyses from this chapter, suggest an alternative conceptualization of community disadvantage; communities can be at a disadvantage when they are bereft of institutions rather than simply economically impoverished.

This idea finds support in Scott Allard's recent book *Places in Need: The Changing Geography of Poverty* (2017). Allard documents the precipitous rise of suburban poverty which has more than doubled since 1990. One chapter details the historical development of the local safety net through programs such as food assistance through Supplemental Nutrition Assistance Program (SNAP) and Temporary Assistance to Needy Families (TANF), as well as local nonprofit service delivery. Allard notes that the nonprofit capacities to both funnel federal and state funding, and implement targeted local efforts overwhelmingly address urban poverty rather than the rising suburban need (Allard 2017: 133). Allard also suggests the urban centers are better equipped with the governmental and nonprofit infrastructure to address poverty. For example, the number of poor and near-poor increased by 25.5% in suburban counties between 2000 and 2010, but the percent change of expenditures from nonprofit human services with fewer than $10 million in annual revenue was only about 9% (pp. 134-35). Yet, Allard is cautious to

abandon the city, arguing that poverty continues to be an enduring concern for urban dwellers.

In my exploratory maps, I observed mixed evidence of these phenomena in the Phoenix metropolitan area. By mapping the distribution of disadvantage and establishments at the census tract level, I observed evidence that non-affluent suburbs had a high number of juvenile offenders, but relatively fewer establishments per capita theorized to reduce recidivism (Figure 4-14). The Native American communities on the periphery were also characterized by higher than average disadvantage and fewer than average organizations per capita. Of these, the Salt River reservation also had a high concentration of juvenile offenders.

However, resource depletion was not exclusively for communities in outlying areas. There were numerous moderately to highly disadvantaged tracts near the urban center with high densities per capita of juvenile offenders and low densities of organizations per capita. Certainly, in the aggregate there was a positive association between disadvantage and organizations, however, pockets of high needs persist.
If, as the literature suggests, local organizations are indicative of community infrastructure to build social and formal control, then it appears these neighborhoods are less developed to provide the kind of oversight and integration required to deter juvenile ex-offenders from future encounters with the law.

As with any research endeavor, there are important limitations worth noting to place these findings in context. First, I do not examine over time data, so these findings are associative rather than causal. Second, my juvenile data are limited to those who completed their supervision rather than all juveniles in trouble. Future research should

consider the relationship between juveniles on continued supervision and their likelihood of reoffending based on community socioeconomics and organizational infrastructure.

Together, the findings from this chapter offer a broad view of the economic, ethnic/racial, and organizational environment of neighborhoods in the greater Phoenix-metropolitan area. The unique growth pattern of the urban Southwest is characterized by suburbanization and exurb development which provides an ideal setting to examine the spatial distribution of organizations and reentering juvenile offenders unlike any previous studies undertaken on this population (Grunwald et al. 2010, Mennis et al. 2011).
For middle class and affluent residents, a spatial mismatch between home and resources may not be an issue if they have reliable transportation access to drive to valued resources and the time to do so. Suburbanization has long characterized metropolitan Phoenix (Gober 2016). With limited geographic constraints and a pro-growth environment, enterprising developers popularized tract-home communities which contributed to the precipitous rise of 55+ "active living" retirement communities and fast-tracked single-family suburban communities for young families. Living near resources may not be necessary for those with advantage. Yet, as work on the suburbanization of poverty suggests (Allard 2017), not everyone in the suburbs is living in affluence. The influence of physical proximity to organizations may be even more influential for youth residents. The organizations (or lack thereof) in one's walkable vicinity may be especially influential to youthful offenders as it structures their delinquent or conforming behaviors. It is this task that I take up in the next two empirical chapters to examine the individual and ecological contributions to repeat offending.

CHAPTER 5: SURVIVAL ANALYSIS OF JUVENILE RECIDIVISM AND NEIGHBORHOOD DISADVANTAGE

The central tenets of social disorganization theory, and "neighborhood effects" literature more generally, suggest that some communities have fewer resources, both financial and social, to inhibit delinquent behavior. Similarly, juvenile delinquency theories emphasize internal and external elements of control that can keep offenders in check (e.g., watchful guardians, conventional activities) or enhance their likelihood of delinquent behavior (e.g., delinquent peers, opportunities for crime). Despite the general logic that social and formal control over youth behaviors, or lack thereof, can be traced to community-level attributes, contemporary juvenile recidivism research has overwhelmingly focused on individual-level attributes such as offender demographics and offense histories, that can predict future risk of repeat delinquent involvement.

In effort to expand the state of knowledge on community-level correlates of repeat offending, this chapter examines recidivism risk for juvenile offenders who completed diversion and probation in the Phoenix metropolitan area in 2007. My primary goal is to ascertain whether a general measure of neighborhood disadvantage is associated with reoffending overall and by offense type, net of individual predictors, before accounting for organizations in the neighborhood. This is a test of the direct relationship between neighborhood disadvantage and juvenile individual risk of recidivism as shown in the conceptual model earlier.

Literature Review

Juvenile Recidivism

Interest in curbing juvenile recidivism is a pressing concern of practitioners, policy-makers, and researchers. Although most juvenile offenders do not continue delinquent behavior into adulthood, the costs to communities and victims at the hands of youth offenders are high (Mulvey et al. 2004). A national rate of juvenile recidivism is difficult to estimate given the heterogeneity in how recidivism is measured and over what length of time, however, Snyder and Sickmund (2006) estimated the juvenile reincarceration rate at 24% with a repeat arrest rate as high as 55%. According to the 2014 FBI Uniform Crime Report, youth under 18 were arrested for 15.1% of serious property crimes (e.g., burglary, arson, and motor vehicle theft) and 10.7% of violent crimes (e.g., aggravated assault, rape, non-negligent manslaughter, murder) making efforts to reduce repeat incidence a formidable but important task.

Individual-Level Predictors of Reoffending

As described in the methodology section, contemporary explanations of juvenile recidivism have largely focused on identifying individual and family-level predictors of youth most likely to recidivate, rather than seeing the neighborhood context as important. Prior individual-level correlates of juvenile recidivism include being male (Cottle et al. 2001) or a racial minority (Aalsma et al. 2015; Stoolmiller and Blechman 2005). Mental health needs (Edens et al. 2007), substance use (Guebert and Olver 2014; Hoeve et al. 2013; Stoolmiller and Blechman 2005), early childhood trauma and maltreatment (Kingree, Phan, and Thompson 2003), child welfare involvement (Baglivio et al. 2016; Huang et al. 2015), disabilities (Zhang et al. 2011), criminal peers (Mulder et al. 2011), and family risk factors (Cottle et al. 2001; Grunwald et al. 2010) have also been identified as risk factors for repeat offending among youthful offenders.

Not surprisingly, offense history plays an important role in predicting the likelihood of future recidivism (Hay et al. 2018). The age when offenders first engage with the juvenile justice system has been linked to increased risk. Youth who were younger at the age of their first offense (Myner et al. 1998) or who were younger at first detention are more likely to chronically reoffend (Cottle et al. 2001). Comparing the predictive strength of individual and family-level variables in a meta-analysis of 25 studies of juvenile recidivism, Cottle et al. (2001) found that age at first commitment, age at first contact with the law, and non-severe pathology such as stress or anxiety were the strongest predictors of recidivism.

The type of prior offenses, rather than the number of offenses, has also been considered important predictor of future risk. An active theoretical and methodological debate has disputed whether specialization in offending patterns or versatility best explains juvenile offending trajectories, particularly related to violence. Piquero (2000) found no specialization with respect to violent offending. Other findings indicate juvenile specialization, even when accounting for offender characteristics and neighborhood context. Grunwald et al. (2010) found a positive association between violent recidivism and drug recidivism and prior charges in those categories. Baker, Metcalfe, and Jennings (2013) found a prior violent, property, drug, or other offense increased the odds of a repeat offense in the same category, controlling for offender demographics. Findings from these few studies have not been conclusive.

There is also some support in the literature that different individual-level predictors are relevant for various subgroups of offenders. Mulder et al. (2011) identified four subgroups of juvenile offenders (serious violent offenders, violent property

offenders, property offenders, and sex offenders) which were sensitive to different risk factors which raises questions about differences in needs. More research is needed to identify the elements of prior offending that are most relevant for different subgroups of juvenile offenders and for specific offending patterns. My approach as described below addresses some of these gaps.

Juveniles and Their Residential Environment

A growing literature provides evidence that juvenile offender delinquency and recidivism is sensitive to aggregate neighborhood characteristics such as levels of economic disadvantage or affluence. For example, the effectiveness of generic risk assessments, which are routinely administered to youth in the justice system to identify program needs (e.g., substance abuse, mental health) or the likelihood of reoffending, has been shown to vary by community context (Miller and Lin 2007; Onifade et al. 2011) and juvenile population (Hay et al. 2018). Other studies report an interactive effect between individual characteristics and levels of neighborhood disadvantage for juvenile repeat offending. Baglivio et al. (2017) studied changes in youth offender assessment scores for juveniles returning home after residential stays in treatment or detention centers. Youth who returned to more affluent communities, who also reported improved family relationships and reduced drugs/alcohol risk, were less likely to recidivate that those returning to less affluent neighborhoods. Another study by Wolff et al. (2017) reported that youth offenders residing in highly disadvantaged areas, who also reported high emotionality and low self-control, were more likely to be rearrested sooner than their counterparts.

Some studies have shown that exposure to protective or risk enhancing populations can influence youthful offending behaviors. The proportion of immigrant residents in the neighborhood has also been shown to reduce the ill effects of resource-deprived neighborhoods for youth offenders. In Florida, Wright et al. (2014) found that juveniles living in areas of concentrated neighborhood disadvantage were more likely to recidivate, controlling for individual characteristics, but more importantly, neighborhoods with higher immigrant concentrations buffered this effect. In Arizona, White and Rodriguez (2014) did not find a direct effect of disadvantage or immigrant concentration for overall recidivism that Wright et al. (2014) observed. Instead, the protective effect of immigration was contingent on individual demographics; Latina girls returning to tracts with a higher concentration of immigrants were less likely to offend.

One reason neighborhood disadvantage has been viewed as a risk for youth delinquency is that it increases exposure to delinquent peers (Zimmerman and Messner 2011). However, other scholars have shown that more unstructured socializing and subsequent offending in pairs or groups of offenders occurs in more affluent communities where the perception of community trust and order is high (Maimon and Browning 2010; Schaefer, Rodriguez, and Decker 2014).

Other research on juvenile recidivism indicates suggests that neighborhood effects are influential for some types of offenses, but not others. Jacob (2016) found that community predictors of juvenile crime incidence varied more by type of offense, than by gender in a study of Canadian juvenile offenders. Residential mobility increased the incidence of property crime for both boys and girls but was unrelated to violent crime. A series of articles has been published by scholars at Temple University using geocoded

data on male juvenile offenders released from Philadelphia's Family Court. The first article using these data (Grunwald et al. 2010) observed that aggregate measures of neighborhood disadvantage or social capital did not significant predict violent or property reoffending. Drug reoffending, however, was sensitive to neighborhood characteristics. Controlling for individual and family predictors, youth residing in disadvantaged neighborhoods were more likely to be charged with a new drug offense. Conversely, drug recidivism risk was lower for youth in neighborhoods with greater social capital. Two subsequent studies using the same dataset reported that juvenile recidivism in Philadelphia was spatially clustered and offense-specific (Harris et al. 2011; Mennis and Harris 2011) suggesting that neighborhood influence in my study may also vary by offense type.

Based on prior work that links neighborhood disadvantage to drug recidivism, as well as emerging work that suggests variation by type of offense, I predict:

H1: Neighborhood disadvantage will increase individual risk of recidivism, controlling for individual characteristics and offense history.

Emerging work suggests I may also observe variation in the effect of neighborhood disadvantage based on juvenile population and offense type.

Methodology

This chapter examines the influence of aggregate neighborhood disadvantage on juvenile recidivism and does so using methodological approaches that add nuance to the current state of knowledge about juvenile reoffending patterns. Much of what is known about juvenile recidivism is based on a dichotomous indicator of repeat offending (Baglivio et al. 2017; Grunwald et al. 2010; Harris et al. 2011, Hay et al. 2018; McNeeley

2018; Wright and Rodriguez 2014). The concerns of dichotomizing continuous data are well documented (Long 1997). Instead, I use survival analysis, also called event history analysis, which retains time to event rather than a binary outcome of recidivism implemented in few juvenile recidivism studies (for an exception see Barrett, Katsiyannis, and Zhang 2010). Survival analysis uses a two-part outcome based on 1) whether an event occurs (e.g. new property offense) and 2) the time to the event (e.g. number of days after ending probation) (Allison 2014). The specific model I use is a Cox proportional hazard model which produces a hazard ratio of the relative risk at any given time for each individual measure. One advantage of this model is that it can be used for competing risks, such as different types of recidivism outcomes. Another benefit of using Cox proportional hazard models is that I test for and include time-varying interactions for measures that vary with time. This provides nuanced information not only about which characteristics are associated with which type of repeat offending, but whether the relative risk changes over time. While I am primarily concerned with the spatial dynamics of recidivism, it is helpful to consider timing of recidivism because environment may play a role in how quickly offenders incur new offenses, if at all.

Another contribution to the field of juvenile delinquency research is that I study recidivism risk for diversion-track youth and probation-track youth in the same study. I divide my sample into two groups to differentiate first-time or low-level offender who completed diversion programs compared to more serious and chronic offenders who were formally sentenced and supervised on probation. Prior work suggests that the influence of neighborhood effects on recidivism can vary by offender characteristics such as race or housing arrangement (McNeeley 2018). There is also reason to expect repeat offending

will vary by supervision type. Barrett et al. (2010) found that youth who were adjudicated processing for status offenses or misdemeanors were more likely to recidivate than youth sent to diversion for similar offenses. One explanation for increased risk for recidivism with similar characteristics may be due, in part, to their level of formal justice system involvement. Another reason to study both juvenile populations is that recent articles on neighborhoods and juvenile reoffending patterns have examined either diversion (Rodriguez 2007) or probation (Baglivio et al. 2017), rather than comparing them both. There is evidence that indicates youth who are formally adjudicated are more likely to recidivate than those who are diverted or not prosecuted for their referral (Barrett et al. 2010). Conducting two sets of analyses allows me to draw some comparisons between juvenile populations and to assess whether the effect of neighborhood disadvantage varies based on which juvenile justice track they completed.

Little is known about whether residential environment impacts some types of reoffending behaviors, but not others. There are only two studies that simultaneously divide by type of offense and account for neighborhood conditions. Research using data from Philadelphia found that neighborhood disadvantage increased drug recidivism among male offenders while neighborhood social capital reduced drug recidivism (Grunwald et al. 2010; Mennis and Harris 2011). Their neighborhood measures, however, were not predictive of violent or property recidivism. Building on this work, I model recidivism for all types of offenses and by type (status/peace, property, and violent/drug). I do not make specific predictions by type of offense since there is insufficient empirical and theoretical literature to substantiate hypotheses. However, by

separating new offenses by type of charge, I may observe variation in the effect of neighborhood on individual delinquency for specific offending activities but not others.

Data

To address these predictions, I used data on reentering juvenile offenders who completed diversion or probation services in the greater Phoenix area in 2007 within the same boundary shown in Figure 4-1. The Maricopa County Office of Juvenile Probation provided deidentified geocoded data for all juveniles who successfully completed diversion consequences or probation consequences in the calendar year 2007[23]. I joined these data with the U.S. Census Bureau American Community Survey estimates from 2005-2009 to account for census tract disadvantage as described in detail in Chapter 2.

Cox Proportional Hazard Models

To examine the individual risk of recidivism, I employed Cox proportional hazard models. This type of survival analysis uses an outcome variable based on two components: the event and time to the event. This type of analysis provides more information about the timing of recidivism than logistic regression models and can be used to model types of competing risks such as different types of new offenses (Allison 2014). I examined recidivism for all types of offense, where recidivism is whether a youth incurred a formal complaint in any of the three categories within 1 year of release from supervision[24]. I also reported models of competing risks to examine offense-

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[23]GIS administrators with Maricopa County adjusted the geolocational data slightly before releasing the deidentified data to ensure confidentiality. Adjustments were slight enough as to place youth in a residential neighborhood but made it impossible to precisely match a juvenile case with a specific parcel or address.

[24] When a youth incurs a new offense at day 135, he or she is censored (removed from the risk pool) at that time point because they are no longer at risk to reoffend. Those who did not recidivate for any new offense are censored at the end of the study (one year+1 day after release).

specific recidivism. This analytical procedure estimates a different hazard function for each type of event (Allison 2014: 56). Youth who received a complaint for a different type of offense other than the focal model are censored from the risk pool at the number of days when the new complaint is recorded.

Cox proportional hazard models assume that the hazard ratio for each measure is consistent over time. It is necessary to test this assumption and add in time-varying interactions when the proportional hazard assumption test indicates change in the hazard ratio varies over time (Allison 2014). The beauty of this method is that it does not require the researcher to specify which variables may vary over time. Instead, I ran the proportional hazards assumption test (phtest in Stata) after each model to identify whether any predictors violated this assumption. I used p<.05 cutoff as my cutoff point, and visually inspected the smoothed hazard estimate charts for variables that failed this test. Based on these criteria, I created time-varying interaction variables for instances where the hazard ratio of the variable was not constant over time. These provided meaningful insights into temporal aspects of recidivism risk where some risks were reduced over time, while others increased incrementally with each day after release. I interpret the specific time-varying interactions in my findings section.

My models can be formally written as

$$y = \alpha + J\beta_j + \varepsilon$$

where y is the time until recidivism or censoring (one year after release in models for all types and recidivism for another offense in offense-specific models), α is the intercept, J is a matrix of juvenile offender predictors which have a vector of β_j on time to

recidivism. I used the clustering function in Stata generating robust standard errors for these models to account for the nesting of juveniles within tracts.

Outcome Variable: Individual Risk of Recidivism

Cox proportional hazard models use a two-part outcome with event and time to event. My recidivism 'event' is the first new complaint filed against a youth within one year of release from supervision. I coded the complaints by offense type to examine individual risk of recidivism for all types of offenses, status/peace, property, and violent/drug offenses. Table 5-1 provides a sample of the types of offenses that fall into each category.

Table 5-1. Recidivism Categories

Type	**Offense Examples**
Status/Public Peace	Excessive Speed Disorderly Conduct Runaway Within County Alcohol Under Age Consumption Tobacco Violation Involving a Minor
Property	Burglary Shoplifting Graffiti, Criminal Damage Theft Means of Transportation
Violent/Drug	Aggravated Assault Aggravated Robbery Simple Assault Intent to Cause Injury Threatening or Intimidating Drug Paraphernalia Possession of Marijuana Drugs On/Near School Grounds

For 'time to event', I used a continuous measure of the number of days from release until the first new complaint + 1 day. Some offenders incurred a new complaint

on the same day they concluded diversion or probation. To ensure these cases remained in the risk pool, I adjusted the measure by adding one day to the count of days from release for every offender. Official records of complaints are a conservative measure of juvenile reoffending and have been used in studies of re-arrest, probation violation, reconviction, or recommitment (Harris et al. 2011; Mennis et al. 2011; see Cottle et al. for a meta-analysis of juvenile recidivism research 2001).

Independent Variables

Individual Characteristics. I included demographic measures in my models that have been shown to influence recidivism including gender, race, age at first offense, and offense history. I used a binary variable to capture gender differences in repeat offending with boys as the reference category. To account for racial/ethnic variation in offending patterns, I included two variables for Hispanic and other, non-Hispanic minority (i.e., Black, Native American, Asian, Other/Unknown) with white as the reference category[25].

Individual Offense and Supervision History. I also included measures of prior offense and supervision history (Cottle et al. 2001). Youth who begin a court record at a younger age are more likely to have sustained court-involvement and higher likelihood of recidivism. I accounted for age at first offense which is measured using the age (in years) when each juvenile offender received her or his first referral. For both diversion and probation, I generated a binary variable for youth who completed 10 or more hours of

[25] Diversion was 9.3% black, 2.9% Native American, and 3.2% other/unknown and probation was 11.6% black, 3.2% Native American, and 1.3% other/unknown. I join these categories into the ‘other minority’ variable to avoid having too few events per variable in my survival models (Ogundimi, Altman, and Collins 2016).

community service hours[26]. I generated a binary variable for 10 or more completed hours of community service to reflect a meaningful amount of time (e.g., more than one work session) where we might expect the youth to gain something from the service time (e.g., feel penance, gain new skills). This variable is important to my overall argument that community context influences recidivism because it assesses in a limited way youth involvement in the community[27].

Prior Offense History. I used different measures of prior offense history for youth on diversion and probation to better reflect meaningful variation within and between the two samples. Most youth on diversion were first time offenders (72%). For diversion models, I used a binary measure to account for youth who had any prior offenses other than the current offense that put them on diversion. Probation offenders had more extensive and varied offense histories than diversionary youth, so I included three measures of offense history based on number of priors, type of prior, and juvenile detention time served. I accounted for the total number of prior offenses, excluding the current offense. I also controlled for specialization in offending. In models predicting recidivism by specific type of offenses such as a property offense, I also included a binary for a past property offense. Finally, I included a dichotomous measure for time served in juvenile detention for youth who spend 24 hours or more detention during the

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[26] The original variable was continuous with a range of zero to 192 hours for probation, but nearly 48% of the sample did not complete any hours. Similarly, diversion work hours ranged from zero to 72 hours, with only 20% completing any hours.

[27] The rationale for court-mandated community service is two-fold. First, youth repay their debt to the community by providing something of value to offset the costs they incurred. The second notion embraced by some juvenile courts is to connect youth with opportunities that allow them to gain new skills, develop new interests, and connect with positive adult role models in the community (Butts 2008). Social control theory informs this perspective which emphasizes youth involvement in conventional activities can strengthen their social bonds to society and deter future delinquent acts (Hirschi 1969).

prior or current supervision tenure[28]. My rationale for including this measure was that juvenile detention differentiates youth with more severe consequences and/or those who were non-compliant from those with less severe consequences and/or who were more compliant with supervision. There is some evidence to suggest that the experience of being committed in a juvenile residential facility such as detention can increase risk of repeat offending (Benda and Tollett 1999; Cottle, Lee and Heilburn, 2001; see Winokur et al. 2008 for contrary findings) so I expected juvenile detention time served to be positively associated with reoffending.

*Neighborhood Disadvantage***.** I used a composite variable from the five-year estimates from 2005-2009 of the U.S. Census Bureau American Community Survey with my study year 2007 as the mid-point. I used factor analysis in Stata to generate a composite disadvantage variable as described in Chapter 4. My final measure included: percent unemployed, percent in poverty, percent of female-headed households, percent with no car, percent with different house in past year, and median family income. Final variable scores ranged from -4.28 to 7.80 (mean -1.24 and standard deviation of 1.78). I assigned each juvenile offender a census tract disadvantage score based on the tract where they lived and used robust standard errors to account for the nesting of individuals within tracts in line with previous recidivism studies (see footnote in Hipp et al. 2010).

I examined potential multicollinearity between all predictors using pairwise correlation matrices (see Tables 5-3 and 5-4). The magnitude of the correlations did not indicate substantial multicollinearity between any of the predictors that would be

[28] The original continuous measure for detention time was right skewed with values ranging from 0 to 419 days, a mean of 19.4 and standard deviation of 42. Over 59% of youth released from probation served less than a full day in detention or no time at all. Fewer than 1 percent of diversion tract youth were detained overnight in juvenile detention, so I did not include this measure in diversion models.

problematic in my models. I also examined the variance inflation factor (VIF) test using days to new complaint as my continuous regression dependent variable. None of the independent variables had an inflated VIF score that would indicate problematic multicollinearity[29].

[29] All VIF scores were under 1.5 for diversion and under 2.5 for probation.

Table 5-2. Descriptive Statistics of Juvenile Offender Measures

	Diversion			Probation			
Individual	**Mean/%**	**SD**	**Range**	**Mean/ %**	**SD**	**Range**	**Variable Metric**
Female	42.6%	0.49	0-1	23.4%	0.42	0-1	1=female, 0=male
Hispanic	43.8%	0.50	0-1	46.2%	0.50	0-1	1=Hispanic, 0=other
White (Reference)	40.7%	0.49	0-1	37.6%	0.48	0-1	1=white, 0=other (reference category)
Other Minority	15.4%	0.36	0-1	16.2%	0.37	0-1	1=Black, Native American, Asian, other/unknown 0=other
Community Service	13.8%	0.35	0-1	45.2%	0.50	0-1	1=completed 10+ hours 0= <10 hours completed
Age at 1st Offense	13.9	1.62	7-16	13	1.64	8-16	Age of juvenile in years
Count of Priors	---	---	---	3.7	2.88	1-21	Count of prior offenses excluding current offense
Any Priors	27.7%	0.45	0-1	---	---	---	1=any prior offenses excluding current offense, 0=none
Prior Status/Peace	---	---	0-1	65.2%	0.48	0-1	1=prior status/peace offense, 0=none
Prior Property	---	---	0-1	66.5%	0.47	0-1	1=prior property offense, 0=none
Prior Violent/Drug	---	---	0-1	49.3%	0.50	0-1	1=prior violent/drug offense, 0=none
Juvenile Detention	---	---	0-1	36.6%	0.48	0-1	1=detention time 24+hours served, 0= <24 hours
Juvenile Offenders N=	6,730			1,608			
Recidivism							
Status/Public Peace	12.3%	0.33	0-1	14.8%	0.36	0-1	1=new status/public peace offense, 0=none
Property	5.8%	0.23	0-1	8.4%	0.28	0-1	1=new property offense, 0=none
Violent/Drug	5.2%	0.16	0-1	10.4%	0.31	0-1	1=new violent/drug offense, 0=none
Any Offense	23.3%	0.42	0-1	33.6%	0.47	0-1	1=new charge all types, 0=no recidivism
Neighborhood							
Census Tract Disadvantage	0.47	1.64	-3.71-7.33	0.61	1.60	-3.71-7.80	Factor score: % unemployed, % in poverty, % female-headed households, % no car, % different household, median household income

Table 5-3. Pearson's Correlation Matrix of Measures: Diversion Youth

	Female	Hispanic	Oth Race	ComServ	Age 1st	Prior	Disadv	Recid	Re_Status	Re_Prop	Re_V/Drug
Female	1										
Hispanic	-0.0044	1									
Other Race	0.0187	-0.3775*	1								
ComServ	-0.0295*	0.0073	-0.0201	1							
Age 1st	0.0353*	-0.0809*	-0.0791*	-0.0017	1						
Prior	-0.0578*	0.0613*	-0.0379*	0.1705*	-0.1917*	1					
Disadvantage	0.0310*	0.4013*	0.0524*	0.0058	-0.1634*	0.0591*	1				
Recid Any	-0.1249*	0.0331*	-0.0263*	0.006	-0.0164	0.1900*	0.0068	1			
Recid Status	-0.0465*	0.0520*	-0.0508*	-0.0149	-0.0039	0.1040*	0.0015	0.6787*	1		
Recid Prop	-0.0671*	0.006	0.0286*	0.0121	-0.0028	0.0948*	0.0367*	0.4518*	-0.0931*	1	
Recid V/Drug	-0.0984*	-0.0202	-0.0053	0.0207	-0.0226	0.1080*	-0.0281*	0.4243*	-0.0875*	-0.0582*	1

Table 5-4. Pearson's Correlation Matrix of Measures: Probation Youth

	Female	Hispanic	Other Race	ComServ	Age 1st	# Priors	Juvie	Disadv	Recid	Re_Status	Re_Prop	Re_V/Drug
Female	1											
Hispanic	-0.0595*	1										
Other Race	0.0560*	-0.4070*	1									
ComServ	-0.0308	0.0328	-0.0256	1								
Age 1st	0.0173	0.0157	-0.0509*	0.0279	1							
# Priors	-0.0548*	0.0355	0.0035	-0.2288*	-0.3177*	1						
Juvie	-0.0605*	0.0267	0.0488	-0.2149*	-0.1398*	0.5655*	1					
Disadv	0.0186	0.3296*	0.0063	-0.0199	-0.0284	0.0856*	0.0931*	1				
Recid Any	-0.1044*	0.0277	0.0275	-0.0348	-0.0504*	0.1752*	0.1081*	0.0278	1			
Recid Status	0.0008	0.0633*	-0.0451	0.0331	0.039	0.0587*	-0.0292	-0.007	0.5862*	1		
Recid Peace	-0.0723*	-0.0377	0.0620*	-0.0677*	-0.0838*	0.1309*	0.1426*	0.0550*	0.4257*	-0.1262*	1	
Recid V/Drug	-0.0970*	0.0034	0.0387	-0.0307	-0.0473	0.0839*	0.0717*	0.0013	0.4788*	-0.1419*	-0.1031*	1

Descriptive Statistics

Table 5-2 reports the mean, standard deviation, and metric for each variable for diversion and probation, separately. In 2007, most juvenile offenders engaged in the juvenile justice system nationally and in the greater Phoenix area were boys. In my sample, girls represented 42.6% of offenders ending diversion, while only 23.4% of the youth reentering from probation were female. These numbers are consistent with national figures on delinquency from the same year. In 2007, girls comprised 43% of petitioned status offenses and roughly 27% of delinquency cases nationally as published in the Juvenile Court Statistics Report (Puzzanchera, Adams, and Sickmund 2010:1277). In my data, Hispanic youth represented 43.8% and 46.2% of the reentering juvenile offenders, respectively. According to the population estimates from the U.S. Census in 2010, Maricopa County, Arizona was 29.6% Hispanic/Latino compared to 16.3% of the national population[30]. Other racial minority youth represented 15.5% of the diversion sample and 16.17% of the probation youth.

Comparing the offense and supervision histories between the two groups paints a portrait of two different juvenile court experiences and histories. Nearly three-quarters of youth completing diversion were first-time offenders (only 27.7% had any prior offense). In contrast, 76% of the probation youth were repeat offenders with a prior offense. Probation youth averaged 3.7 prior offenses. Over two-thirds of probation youth had a least one prior property charge (66.5%) with status/public peace offense following closely behind (65.2%). Nearly half of the probation youth had completed at least 10

[30] Source: U.S. Census Bureau, 2010 Census. Summary File 1, Tables P5, P8, PCT4, PCT5, PCT8, and PCT11. Profile of General Population and Housing Characteristics: 2010

hours of community service (45.2%) compared with only 13.8% of diversion youth. Fewer than one percent of diversion youth had served 24 hours of juvenile detention time[31], while 36.6% of probation youth had been detained in a secure facility.

Recidivism

Most youth who successfully completed diversion or probation did not reoffend. Recidivism occurred in 23.3% of diversion cases, most commonly for a new status offense/public peace violation (12.3%) followed by property complaints (5.8%) and violent/drug offenses (5.2%). Roughly one-third (33.6%) of probationers reoffended. Status/public peace violations were the most common first new offense (14.8%) followed by violent/drug (10.4%) and property offenses (8.4%). These figures are slightly lower than reported averages in existing research. Cottle et al. (2001) reported an average recidivism rate of 48% from 22 samples of juvenile offenders with a range of 22-75%. However, many of these studies examine only male populations and the juvenile delinquency rate is lower among female offenders.

Neighborhood tract disadvantage scores, on average, for both samples were higher than the mean disadvantage score for the entire study area (mean = -1.24). Probation youth lived in more disadvantaged neighborhoods than their diversion counterparts, but the magnitude of the difference was modest (.47 to .61, respectively).

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[31] I omitted this variable from the diversion models given the skewed distribution, so it does not appear in the descriptive table.

Table 5-5. Hazard Ratios of Recidivism by Offense Type for Diversion Youth

	All Types				Status/Peace			
	1		2		3		4	
Individual	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.598***	(.033)	0.599***	(.034)	0.744***	(.054)	0.746***	(.056)
Hispanic	1.088	(.060)	1.102	(.068)	1.209*	(.090)	1.267**	(.104)
Other Minority	0.942	(.075)	0.950	(.082)	0.732*	(.089)	0.754*	(.086)
Comm. Service	0.831*	(.061)	0.832*	(.063)	0.735**	(.079)	0.735**	(.073)
Age at 1st	1.035*	(.016)	1.034*	(.016)	1.135**	(.049)	1.131**	(.046)
Any Priors	3.379***	(.321)	3.381***	(.325)	3.026***	(.418)	3.033***	(.424)
Time-Varying								
Time*Prior	0.998***	(.000)	0.998***	(.000)	0.998**	(.001)	0.998**	(.000)
Time*Age 1st					0.999*	(.000)	0.999**	(.000)
Neighborhood								
Disadvantage			0.992	(.020)			0.971	(.023)
Recidivism N=	1,568		1,568		826		826	

Notes: † p<.10, * p <.05 , **p <.01, *** p<.001.
N=6,730 juvenile offenders, N=2,151,267 time at risk spells.
Time-vary predictors were included based on proportional hazards assumption tests (phtest) and visually inspecting smoothed hazard estimate charts for variables that failed the phtest at p <.05. Robust standard errors using Stata clustering by census tract were used for models with disadvantage measure. In Models 3-8, offenders recidivating for a new offense other than the focal offense type were right-censored (see in-text description of modeling competing risk).

Table 5-5 Continued. Hazard Ratios of Recidivism by New Offense Type for Diversion

	Property				Violent/Drug			
	5		6		7		8	
Individual	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.544***	(.060)	0.537***	(.064)	0.372***	(.048)	0.375***	(.049)
Hispanic	1.173	(.134)	1.030	(.135)	0.777*	(.091)	0.860	(.118)
Other Minority	1.529**	(.219)	1.408*	(.205)	0.858	(.139)	0.915	(.147)
Comm. Service	0.912	(.129)	0.908	(.129)	0.970	(.141)	0.972	(.152)
Age at 1st	1.062†	(.034)	1.071*	(.032)	1.001	(.032)	0.995	(.031)
Any Priors	4.252***	(.781)	4.226***	(.788)	2.721***	(.304)	2.734***	(.311)
Time-Varying								
Time*Prior	0.996***	(.001)	0.996***	(.001)				
Time*Age 1st								
Neighborhood								
Disadvantage			1.085*	(.036)			0.935	(.039)
Recidivism N=	393		393		349		349	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001.
N=6,730 juvenile offenders, N=2,151,267 time at risk spells.

Table 5-6. Hazard Ratios of Recidivism by New Offense Type for Probation Youth

	All Types				Status/Peace			
	1		2		3		4	
Individual	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.658***	(.076)	0.658***	(.079)	0.930	(.144)	0.934	(.144)
Hispanic	1.134	(.109)	1.124	(.116)	1.268†	(.181)	1.342†	(.181)
Other Minority	1.226	(.156)	1.219	(.154)	0.328*	(.162)	0.339*	(.162)
Comm. Service	1.022	(.093)	1.023	(.095)	1.251†	(.169)	1.249†	(.169)
Age at 1st	1.002	(.028)	1.002	(.030)	1.115*	(.050)	1.114*	(.050)
Count of Priors	1.089***	(.018)	1.089***	(.020)	1.010**	(.031)	1.099**	(.031)
Juv. Detention	1.043	(.113)	1.042	(.121)	0.627**	(.106)	0.634*	(.106)
Prior Status/Peace					1.592**	(.272)	1.602**	(.272)
Prior Prop								
Prior Violent/Drug								
Time-Varying								
Time*Other Min					1.005*	(.002)	1.005**	(.002)
Time*Com Serv.								
Time*Prior V/D								
Neighborhood								
Disadvantage			1.007	(.032)			0.957	(.046)
Recidivism N=	540		540		238		238	

Table 5-6 Cont. Ratios of Recidivism by New Offense Type for Probation

	Property				Violent/Drug			
	5		6		7		8	
Individual	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.507**	(.130)	0.496**	(.125)	0.401***	(.098)	0.402**	(.109)
Hispanic	0.852	(.169)	0.747	(.159)	1.140	(.202)	1.160	(.231)
Other Minority	1.456	(.333)	1.346	(.316)	1.442†	(.317)	1.457†	(.299)
Comm. Service	0.786	(.150)	0.805	(.150)	2.107*	(.664)	2.103*	(.671)
Age at 1st	0.908†	(.048)	0.906†	(050)	0.960	(.047)	0.960	(.053)
Count of Priors	1.042	(.034)	1.040	(.031)	1.057†	(.033)	1.057†	(.035)
Juv. Detention	1.968**	(.425)	1.938**	(.396)	1.174	(.231)	1.176	(.266)
Prior Status/Peace								
Prior Property	1.309	(.277)	1.278	(.269)				
Prior Violent/Drug					2.325*	(.760)	2.315**	(.736)
Time-Varying								
Time*Other Min								
Time*Com. Serv.					0.995**	(.002)	0.995**	(.002)
Time*Prior V/D					0.996*	(.002)	0.996*	(.002)
Neighborhood								
Disadvantage			1.113*	(.060)			0.987	(.062)
Recidivism N=	135		135		167		167	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001.
N=1,608 juvenile offenders, N=485,589 time at risk spells.

Findings

Tables 5-5 and 5-6 report the hazard ratios of the likelihood of recidivism for any of the three categories, and by type of recidivism (status/public peace, property, violent/drug). The first column reports the influence of individual demographics and offense history. The second column includes the composite measure of neighborhood disadvantage. For ease of interpretation, I report the findings by type of recidivism. Within each section, I describe the findings for both diversion and probation juveniles. I focus on the second column of each section which includes the neighborhood disadvantage score.

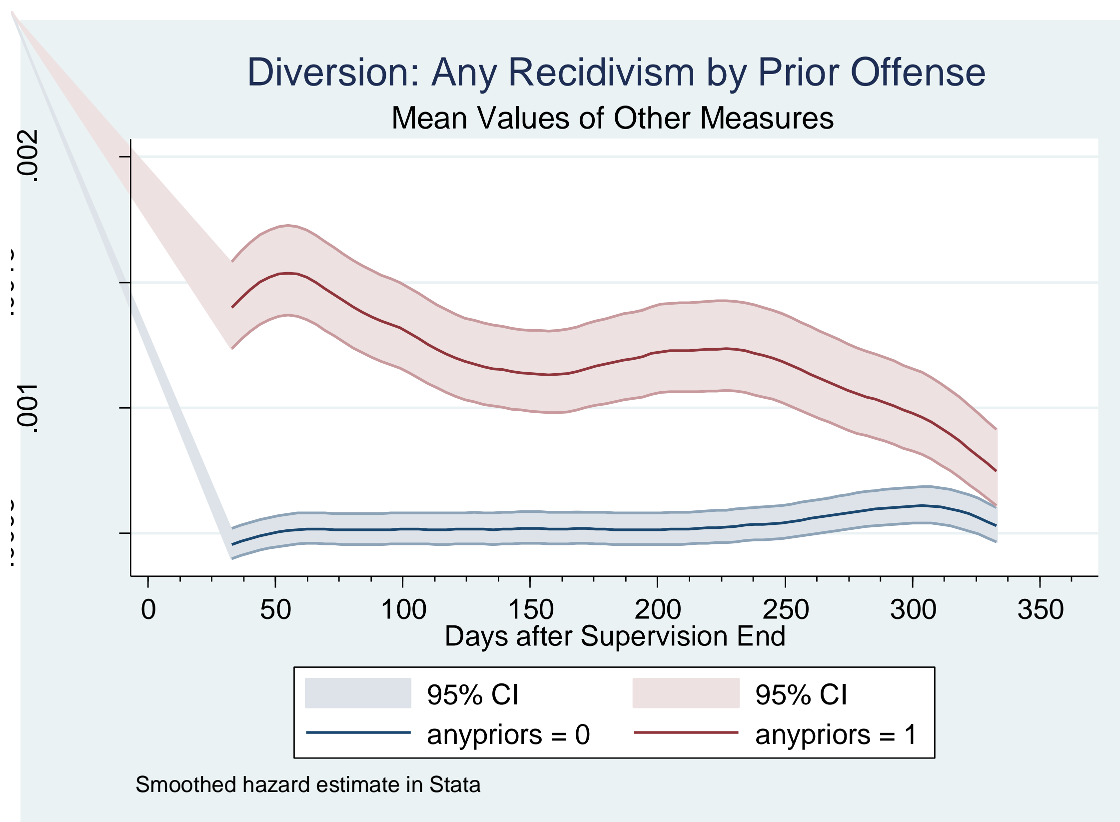
All Types of Recidivism

Models 2 in Table 5-5 and Table 5-6 report the hazard ratios of recidivism within one year for any of the three types of new complaints combined, accounting for individual predictors and neighborhood disadvantage. Only 23.3% of reentering diversion offenders and 33.6% of reentering probation offenders repeat offended for these types of complaints within the first year. Most juvenile offenders who successfully completed their consequences did not repeat offend. For those youth who did receive a new complaint, individual demographics and offense history were the strongest predictors of recidivism, while neighborhood disadvantage was unrelated to repeat offending.

For both juvenile offender populations, gender and prior offense history influenced overall recidivism in the expected direction. Girls ending diversion were 40.1% less likely than boys to recidivate at any point in time, while girls ending probation were 34.2% less likely to reoffend. Reentering diversion offenders with any

prior offense were more than three times as likely to recidivate at the time of completion than first-time offenders (HR=3.381). Notably, this measure had a significant time-varying interaction which indicates the effect of prior offense was not consistent over a year. Instead, the hazard of recidivism was highest in the first month of release from supervision, decreasing over time (HR=.998). To illustrate a time-varying interaction, Figure 5-1 shows the smoothed hazard estimate over time for those with and without a prior offense, holding other variables at the mean. For reentering probation youth, each prior offense on a juvenile's record increased their recidivism risk by 8.9%, but juvenile detention time served was not predictive of overall recidivism.

Figure 5.1. Smoothed Hazard Estimate of Diversion: Any Recidivism by Prior Offense



Diversion recidivism for any new offense was also influenced by community service and age at first offense. Youth who completed 10 or more hours of community service had a 16.8% reduction in likelihood of overall recidivism (HR=.832), while youth who were older at the time of their first offense were more likely to recidivate, but the effect was comparably quite small (HR=1.035). Race was not predictive of recidivism risk for diversion or probation youth. Likewise, neighborhood disadvantage was not associated with overall recidivism, and changes in the coefficients of individual predictors were negligible with the inclusion of disadvantage scores.

Status/Public Peace Recidivism

Most new offenses for both juvenile populations were status/public peace complaints with 12.3% of diversion and 14.8% of probation recidivism in this category. Status offenses are violations such as tobacco/alcohol use and running away, which are illegal based on the minor's age but are not prohibited for adults. Public peace offenses include such actions as excessive speed when driving and disorderly conduct such as fighting or excessively loud noise. This range of offending behaviors are considered minor. Some have proposed radical nonintervention as the best approach arguing these types of behaviors are not indicative of criminality, although they are against the law, but rather a natural part of adolescence (Schur 1973). Nevertheless, despite their relatively low-level disruption, when repeat offenders have a new complaint filed against them after successfully completing their juvenile court involvement, it often leads to repeat engagement with the juvenile justice system.

Gender was significant and negatively associated with reducing recidivism risk for diversion offenders, but not probation offenders. Girls ending diversion faced a lower

risk of a new status/public peace complaint, but the margin narrowed from the overall recidivism model (HR=.746 in Model 4 compared with HR=.599 in Model 2). For youth ending probation there was no gender effect; girls and boys were equally at risk for status/public peace recidivism.

Race and offense history measures were predictive of repeat status/public peace offenses for both populations. Among diversion offenders, Hispanic youth were 26.7% more likely to repeat offend for status/public peace recidivism compared to whites, the reference category, while other minorities were 24.6% less likely than white offenders to recidivate in this category (HR =.732). The direction of influence was the same for probation offenders. The term for Hispanic youth was marginally significant indicating elevated risk of recidivism compared to whites for status/public peace offenses (HR=1.342, $p<.10$). Other minorities on probation were 66.1% less likely recidivate for status/public peace offenses than whites at the time of probation end. The measure of other race also had a statistically significant, positive interaction with time (HR=1.005). Immediately after release, non-Hispanic minority youth were less likely to incur a new status/peace charge than whites, but over time the hazard estimate increases.

Offending history was the strongest predictor of repeat status/public peace offending for both populations. For diversion youth, having a prior offense and being older at the time of first offense increased likelihood of recidivism at diversion end. Both measures, however, had a significant time-varying interaction indicating risk reduction over time. Reentering diversion youth with a prior offense were over three times as likely as first-time offenders to obtain a new status/public peace complaint (HR=3.033) at time of completion with a decrease with each day post-release (HR=.998). Diversion

who were older at the time of their first offense had increased recidivism likelihood at diversion end (HR = 1.131) with a reduction over time (HR=.999). Probation youth who were older at the time of their first offense (Table 5-6 Model 4) also had a higher hazard of status/public peace recidivism that was constant across time (HR=1.114).

Notably, there was a significant and negative association between community service and status/public peace reoffending for diversion offenders. Diversion youth who completed community service had a 26.5% reduction in the hazard of recidivism compared to those who did not complete at least 10 hours of service.

Offending history was also predictive of status/public peace recidivism risk for probation youth. My use of alternate measures for probation juveniles to capture the extent and specialization of offending behaviors produced substantive finding. First, each additional prior offense increased the likelihood of recidivism by 9.9% which aligns with the findings for diversion. I also found that a prior status/public peace offense increased recidivism risk by 60.2% suggesting a specialization effect for these types of offenses.

The findings related to community service and juvenile detention time are less clear. Community service was marginally significant and positive associated with repeat offending (HR=1.249, p<.10) rather than reducing recidivism risk, as was the case for diversion tract youth. At least 24 hours in juvenile detention, in contrast, was associated with a 33.6% reduced risk for status/public peace recidivism at the time of probation end. The neighborhood disadvantage term had no effect in predicting the hazard of status/public peace recidivism for either juveniles ending diversion or probation.

Property Recidivism

The hazard ratios of property recidivism are reported in Table 5-5 and 5-6, Models 5-6. New property offense complaints comprised 25% of the recidivism events for both diversion and probation offenders. These types of offenses included shoplifting, burglary, graffiti, and theft of means of transportation. Among diversion youth, gender, race, prior offenses, and age at first offense were significant predictors of recidivism risk. Girls faced a lower hazard of recidivism (HR=.537) than boys. The predictor for Hispanic was not significant, however, other minority youth were 40.8% more likely than whites to incur a new property charge within the first year of diversion completion. Age at first offense was positively associated with risk, but magnitude was relatively low compared to other predictors (HR=1.071).

The influence of a prior offense was the strongest predictor of recidivism. Reentering diversion youth who were not first-time offenders were over 4 times as likely to reoffend for a property offense than those without a prior offense (HR=4.226). A time-varying interaction measure was significant and indicated a reduction in the hazard of recidivism with each successful day post-completion (HR=.996). Thus, those with a prior offense were not only more likely to recidivate, but more likely to incur a new property charge early after diversion end. Notably, the neighborhood disadvantage score shown in Model 6 was statistically significant and positively associated with recidivism risk. One standard deviation rise in the neighborhood disadvantage score enhanced the likelihood of property recidivism by 8.5%.

For probation youth, there were fewer significant predictors of property recidivism. Girls were about half as likely as boys to have a complaint filed against them

for a new property offense at any time (HR=.496). Race was not associated with property recidivism risk for juveniles reentering from probation.

Findings related to prior offense history departed from those for diversion youth and for status/public peace offending. Age at first offense was marginally significant and indicated youth who were *younger* at the time of their first infraction had a higher hazard of recidivism (HR=.906, p<.10). Notably, the other prior offense history measures were not significant. Neither the number of prior offense nor a prior property offense were predictive of recidivism risk. However, juvenile detention time served was associated with increased risk. Youth who had spent at least 24 hours in juvenile detention were more 93.8% more likely to recidivate at any given time with a new property offense than those without detention records. Neighborhood disadvantage was significant and positive. A one standard deviation increase in neighborhood disadvantage score enhanced recidivism risk by 11.3%.

Violent/Drug Recidivism

Violent/drug recidivism was the least common type of new complaint filed against repeat offenders from diversion (22.2%), whereas 30.1% of recidivism events for probation juveniles were for violent/drug complaints. These types of infractions included: aggravated assault, threatening or intimidating, aggravated robbery, possession of marijuana, and drugs on/near school grounds. Compared with the status/public peace offenses above, these types of offenses indicate more serious delinquency behaviors.

In Table 5-5 Model 8, only two predictors are significant for diversion youth recidivism risk, controlling for neighborhood disadvantage. Girls had a 62.5% lower hazard of violent/drug recidivism than boys at any given time. Youth with any prior

offense history were over twice as likely to recidivate in this category than those without (HR=2.734). Neighborhood disadvantage was not significant.

Model 8 in Table 5-6 reports findings for probation youth. Girls were 59.8% less likely to incur new violent/drug charges at any time compared with boys. A marginally significant coefficient for other race suggests that non-Hispanic minorities were more likely than whites to incur new drug/violent charges (HR=1.457, p<.10), but no statistically significant difference was observed for Hispanic youth compared to whites. The influence of neighborhood disadvantage was not statistically significant for probation offender recidivism.

The measures for supervision history indicate that offense specialization, rather than extensiveness of prior history was a stronger predictor of recidivism in this category. Each prior offense was associated with a marginally significant 5.7% increase in recidivism risk (p<.10). However, having one or more prior violent/drug charge more than doubled the likelihood of a repeat offense in this category (HR =2.315) at the time of release. The effect of a prior violent/drug charged decreased with each day of successful post-release (HR=.996). Juvenile detention time and age at first offense were not associated with repeat violent/drug offending.

The effect of community service time, those who completed 10 or more hours of community service, were over twice as likely to incur new violent/drug charges at the time of supervision completion (HR=2.103), with decreases in hazard over time (HR=.995). This finding requires cautious interpretation since my data are associative rather than longitudinal. Looking at the finding for community service across all models can shed light on the substantive interpretation of this finding. For diversion youth,

community service decreased overall recidivism and status/peace reoffending. One explanation is that this measure should be interpreted differently based on the two populations. For first-time, low-level offenders who are completing a diversion track, completion of compulsory community service time is indicative of compliance with the process and may, as I articulated earlier, provide accountability and/or a sense of community integration that increases the social bond. In contrast, for more serious offenders who were supervised on probation, community service hours completed may be more a measure of the severity of consequences assigned than a measure of social integration or accountability.

To summarize, the key findings from this chapter are:

1. Neighborhood disadvantage increased the hazard of property recidivism for juvenile offenders ending diversion and probation, accounting for individual characteristics and offense history. However, neighborhood disadvantage was unrelated to repeat offending when predicting status/public peace, violent/drug or overall recidivism for either juvenile population.
2. Gender and offense history were the most consistent individual-level predictors of recidivism risk across the models.
3. Both the number of priors and the type of prior offenses were significant predictors of status/public peace and violent/drug reoffending among probation youth, but these measures were unrelated to property reoffending.
4. Significant time-varying interaction terms, particularly for prior offense history, indicated changes in the likelihood of recidivism over time. In half of the models,

the risk of prior offenses was highest early after release from supervision, with the hazard ratio declining with each day without a new offense.

Discussion/Conclusion

This research extends the work on juvenile recidivism by revisiting the role of community context in amplifying or tempering the likelihood youthful offenders will have a repeat encounter with the law after completing their consequences successfully. This research is one of the first to examine neighborhood influence on juvenile recidivism by type of new offense *and* by juvenile population for both girls and boys using Cox proportional hazard models. Findings from this research provide insights that can inform juvenile justice policy and scholarship that seeks to reduce repeat engagement with the law for offenders who have been released successfully from their juvenile justice supervision. The main contribution of this chapter is that I examined the influence neighborhood-level disadvantage, measured at the census tract level, on the likelihood of recidivism for any new offense, status/public peace, property, and violent/drug complaints within one year of successful ending diversion or probation. In doing so, this chapter extends the current state of knowledge about when neighborhood disadvantage matters, for whom, and for what types of activities. I elaborate the key findings, and how they intersect with the current literatures on juvenile recidivism, in the sections that follow.

The results of this study suggest that neighborhood context can influence recidivism risk, but some offense types are more sensitive to community factors than others. Notably, neighborhood disadvantage was not a strong predictor of repeat recidivism compared to individual-level characteristics and was only associated with one

of the four offense types. Only property reoffending was positively influenced by higher levels of community disadvantage.

Offense-Specific Neighborhood Effect

My results reinforce prior work on juvenile crime that indicates neighborhood influences are offense-specific (Jacobs 2006; Grunwald et al. 2010). I found that neighborhood disadvantage enhanced the risk of repeat offending for property offending, but not for status/public peace or violent/drug offending. Juvenile offenders ending probation or diversion who lived in more economically disadvantaged communities faced a higher likelihood of property crime recidivism, controlling for individual characteristics and offense history. This aligns with social disorganization theory and prior neighborhood effects research that emphasize individual delinquent behavior is sensitive to aspects of the local environment where offenders reside. Notably, this finding predicted only *property* offense recidivism. Neighborhood disadvantage was not statistically significant in predicting overall recidivism, status/public peace, or drug/violent recidivism.

Although the influence of neighborhood disadvantage was modest compared to individual indicators such as gender and offense history, this finding was consistent across juvenile populations which suggests that property offenses are distinct from other types of offenses. Previous studies have found that accounting for offense-type specialization may be necessary in juvenile delinquency research that assesses neighborhood effects. The only prior study to examine this relationship for individual juvenile recidivism, by Grunwald and colleagues (2010), reported an association between neighborhoods and individual drug recidivism, but not property or person offenses.

Community-level social capital reduced the likelihood that male offenders in their study would reoffend for drug complaints, while neighborhood disadvantage increased risk of drug recidivism. The authors offered an explanation specific to the drug trade in Philadelphia which is concentrated in impoverished Hispanic communities where kinship and family ties are likely to influence offender behavior. A related explanation is that the concentration of Hispanic youth in areas of high poverty makes drug offending more appealing to offenders facing limited opportunities. A different study (Jacob 2006) of Canadian census tracts (2006) found a link between high residential mobility and juvenile property crime apprehension rates but found no association between residential mobility and violent crime. As my study and these prior articles observed, it is important to differentiate by types of offenses when modeling neighborhood influences of juvenile offending behavior. Only by separating the outcome variable by offense type was I able to observe a modest influence of neighborhood disadvantage as it increased the hazard of property recidivism for both juvenile populations.

I also found support for the idea that offending types, rather than offender population, matters more when assessing the risks of neighborhood. There were some modest differences between offender populations in terms of individual characteristics, but gender and offense history were the strongest indicators of future risks for all offender, regardless of their supervision track. Only one type of offending, property recidivism, was influenced by neighborhood disadvantage. This was consistent across juvenile populations. The impact of neighborhood disadvantage on property recidivism was similar for probation and diversion, with a slightly larger risk hazard for probationers (HR=1.113 and HR=1.085, respectively).

Individual Characteristics

In line with existing research on juvenile delinquency, I found that demographic and offense history measures were stronger and more consistent predictors of repeat offending within of year of ending court involvement (Cottle et al. 2001). Gender and offense history were significantly associated with repeat offending and in the expected directions across nearly all models. Girls ending diversion had lower hazards of reoffending for all new offenses, particularly violent/drug offending. Similarly, girls ending probation had lower recidivism risks compared to boys for all offenses except status/public peace offenses. This aligns with previous research which finds that boys are more likely to be referred for more serious offenses, while girls are more likely to be referred for status offenses (Barrett et al. 2006).

My findings related to age at first offense were mixed and did not, however, fit with the predictions of prior research which links early age of first referral to repeat offending (Cottle et al. 2001; Barrett et al. 2010; Mulder et al. 2011). Youth in my study who were older at the time of their first offense were more likely to repeat offend for status/public peace offenses which is consistent with the idea of "adolescent-limited" offenders who are older when they begin offending and are involved in low-level delinquency compared to more serious crimes (Moffit 2003). However, probation youth who were older at the first offense were also more likely to receive a new complaint for a property offense within the first year which is an unexpected finding. This finding should be taken with caution given the numerous previous studies that associate age at first offense with future offending. One reason I may observe this contradictory finding

is that I am measuring those juveniles who have successfully completed their supervision, rather than repeat referrals for all court-involved juveniles.

Prior Offense History: Specialization versus Extent

Not surprisingly, prior offense history amplified recidivism risk across nearly all types of offenses for both diversion and probation youth which is consistent with current research (Cottle et al. 2001; Mulder et al. 2011). For diversion youth, the differentiation between first-time offenders and those with any prior offense history was sufficient to predict repeat offending patterns. This measure was significant and positive across all models of recidivism, but it was an especially strong predictor of property recidivism. Youth who had any prior offense on their record were over four times as likely as first-time offenders to repeat offend for property offense at the time of diversion end (HR=4.226).

For probation offenders, I considered both the number *and* category of prior offenses. In offense-specific models, I included a count of all prior offenses (excluding the current offense) as well as a binary variable indicating any prior offense in that category. This allowed me to differentiate the extensiveness of prior history from specialization as it pertained to future risk of recidivism.

Results from these models provided support for offender specialization for status/public peace and violent/drug offending. I found that a prior status/public peace offense was associated with a 60.2% increase in the hazard of status/public peace offending among probation juveniles. A prior violent/drug charge more than doubled the risk of repeat violent/drug recidivism (HR=2.315) with a significant time-varying term indicate a decrease in this risk over time (HR=.996). These findings align with previous

work (Baker et al. 2016; Grunwald et al. 2010). Together, these results indicate that it would benefit juvenile justice policymakers and scholars to consider how previous offense types may predict not only whether a youth will reengage with the law, but for what type of new offense. By identifying the possible triggers for new offenses, such as delinquent peer involvement for status/public peace offenses or substance abuse/mental health treatment, may inform the approaches parents, juvenile justice professionals and policy-makers take to prevent repeat delinquency.

Temporal Aspects of Recidivism Risk

I also found significant time-varying interactions that elucidate temporal patterns of repeat offending. In testing for time-varying interactions, I found evidence that offenders with specific characteristics faced the greatest risk of repeat offending *early* after release. Youth on diversion with any prior offense on record were more than four times as likely to recidivate for property offenses than first-time offenders (HR=4.252) at the time of completing diversion, but this risk declined over time. Relatedly, probation youth with prior violent/drug charges were most vulnerable for a new violent/drug charge in the days immediately following their release from supervision, with a reduction in the hazard of recidivism over time. This type of nuanced information can speak to the complexities of juvenile offending patterns as situated in geographic space and time (i.e., the neighborhood and days following release) which may be pertinent to strategic juvenile aftercare and reentry policies.

Property Offending and the Neighborhood

Property reoffending was the only type of recidivism to be influenced by an aggregate measure of disadvantage, though the effect was modest compared to individual

predictors. There were also some noticeable departures in the influence of individual characteristics compared to other new offense types. Diversion youth who were boys, other non-Hispanic minorities, older at the time of first offense, had a prior offense, and lived in more disadvantaged neighborhoods were more likely to reoffend for property charges. This was the only model where other minorities faced a higher risk than white offenders (HR=1.408); the measure for Hispanic was not significant. The influence of a prior offense was substantial (HR=4.226) the largest hazard ratio reported in any of the models, with a time-varying reduction in risk over time.

Notably, for probation youth, property reoffending was not associated with the count of prior offenses or a binary of a prior property offense, which were strong predictors of repeat recidivism risk in other models. Instead, gender, juvenile detention time, and neighborhood disadvantage were associated with new property complaints. Youth who had served at least 24 hours in juvenile detention were nearly twice as likely to recidivate for property offenses (HR=1.938). There is mixed evidence about whether time spent in detention facilities increases risks of repeat delinquency for youthful offenders (Benda and Tollett 1999). A study of first-time violent juvenile offenders in Los Angeles County found that youth spending time in a detention camp were twice as likely to recidivate compared with first-time violent offenders who were placed on in-home probation (Ryan, Abrams, and Huang 2014). Winokur and colleagues (2008) found length of stay was only significant in predicting recidivism for male offenders and those released from high-risk facilities.

Learning theories, such as differential association theory suggest that exposure to delinquent peers can enhance criminality and among adolescents this association can be

quite strong (Cottle et al. 2001; Mulder et al. 2011). This may help explain why offenders from probation who served time in juvenile detention were at greater risk for property charges after completing supervision. The argument would be that time in detention with other youthful offenders increased their exposure to delinquent ideals leading to future criminality.

Relatedly, some have argued that the influence of neighborhood disadvantage on juvenile delinquent behavior is due to exposure to delinquent peers in the neighborhood. Exposure to delinquent peers as a risk for repeat offending has empirical support among both juvenile and adult populations (Harris et al. 2011; Stahler et al. 2013). Harris and colleagues (2011) call this a 'contagion effect.' In their study using the Philadelphia Family Court dataset, they calculated an offense-specific area recidivism rate within 1 kilometer of each juvenile's home. Results indicated that a spatial concentration of other offenders recidivating for a type of offense (e.g., drug, violent or property) increased individual risk of recidivism for that same offense, controlling for individual offense histories. Another study by Wright et al. (2014) found support for an indirect effect of peer contagion using self-report data, the Pathways to Desistance longitudinal study. They reported that youth residing in neighborhoods of concentrated disadvantage had increased exposure to delinquent peers, which enhanced susceptibility to repeat offending. Future research should consider the influence of delinquent peers on particular types of new offenses.

Another explanation for my study results is that there is something about the context in which property offending occurs that makes it sensitive to community disadvantage. The routine activities approach is illustrative, as this body of work

emerged specifically to address predatory crimes such as theft or burglary. The logic of a routine activities perspective argues that predatory crimes are the result of suitable targets, motivated offenders, and a lack of supervisory agents (Cohen and Felson 1979; Osgood and Anderson 2004). In more impoverished neighborhoods, the combination of limited economic opportunities, as well as residential mobility, lack of access to a car, and single-parent homes may enhance opportunities for property offenses such as graffiti, bicycle/car theft, burglary, or shoplifting.

Most prior work using a routine activities approach has examined this question at a macro-level and has reported mixed findings linking economic and social indicators to property crimes. In theory, high poverty areas should reduce the availability of possessions worth stealing in which case disadvantage would have fewer incidence of property theft, as observed in the association between national GDP and property crime (Bennett 1991). However, macro-level studies across metropolitan areas have found the mixed results depending upon the type of crimes and economic indicators used (Messner and Blau 1987; Pollock et al. 2010; Roth 2016). Other work has reported findings relative to weakened guardianship (e.g., both parents working, more single-family homes). Roth (2016) found male and female burglary rates were higher in areas with a greater proportion of families with working parents. Jacob (2016) observed that Canadian census tracts with high residential mobility had higher rates of juvenile property crime apprehension, but this measure was unassociated with violent crime apprehensions. Pollock, Joo, and Lawton (2010) found that juvenile offender arrests for burglary across Texan cities were lower in areas with a greater proportion of female-headed households but found a positive association between poverty and burglary arrests.

I used a disadvantage measure that captured economic and social dimensions that indicate both lack of opportunity and reduced supervisory capacity (e.g., percent in poverty and percent of female-headed households) enhanced property recidivism risk, but modestly compared to individual characteristics.

Taken together, the prior literature is inconclusive about precisely which elements of the neighborhood influence juvenile property offending behavior but suggest that ecological predictors of property offending deserve additional scholarly attention. It is this gap in the literature that I address in the next chapter by examining the role of neighborhood organizations in juvenile recidivism risks.

Limitations and Next Steps

There are important limitations in my data worth noting. The biggest drawback of my dataset is that I am unable to account for family context such as socio-economic status, family criminal history, or the strength of the social bond between youth and parents. Family context can buffer youth from neighborhood influence, as has been shown in immigrant families in high poverty areas (Burrington 2015). Family factors can also increase criminality when history of crime, adverse childhood experiences, instability, or lack of ability to supervise influence youth orientations toward and opportunities for deviance and crime (Baglivio et al. 2016; Fox et al. 2015). My dataset did not contain reliable family data and thus could not be included in the models. Future research should consider the confluence of family context and neighborhood context as it specifically relates to juvenile recidivism and type of offense.

Despite these limitations, the models here provide pivotal baseline upon which to improve our understanding of how aspects of the neighborhood influence individual

behavior. My use of a composite neighborhood disadvantage score suggests that a "neighborhood effect" measured in this way is not consistent across offenses and offender populations. Instead, my findings show that property recidivism is particularly contingent on socioeconomic environment. This is an advancement over previous work that has almost exclusively examined individual characteristics, rather than environmental factors, in predicting juvenile repeat offending. Yet, for all the reasons cited in my literature review, a crude neighborhood disadvantage score provides only a rudimentary indication of how and, most importantly, *why* neighborhood context matters for juvenile property recidivism but not other offenses. Building on these findings, my next chapter adds *organizations* to the conversation as overlooked players that may increase or decrease risk for repeat offending, net of neighborhood disadvantage and individual characteristics.

CHAPTER 6: SURVIVAL ANALYSIS OF JUVENILE RECIDIVISM AND NEIGHBORHOOD ORGANIZATIONS

As summarized earlier, few empirical studies have examined the influence of neighborhoods on juvenile repeat offending and no recent works have specifically examined the contribution of organizations in a community to juvenile repeat delinquency. This chapter seeks to fill this gap by extending the findings from the previous chapter on individual recidivism by accounting for the specific types of organizations available within the local communities of reentering juvenile offenders.

A body of research, reviewed by Morenoff and Harding (2014), examines how the residential communities of reentering adult offenders influence their subsequent recidivism or successful reintegration. Specifically related to organizations, there is some evidence to suggest that certain types of facilities are criminogenic (Groff and Lockwood 2014) while others provide services that can reduce repeat criminality (Hipp et al. 2010). Although research examining the spatial distribution of organizations and repeat criminality is promising, the literature is relatively sparse. There is no consensus between scholars as to which organizations matter, the direction of influence, and for what type of criminal activity (Wo 2016). The relationship between crime and neighborhood organizations remains somewhat “elusive” (Slocum et al. 2013) and more research in more contexts is needed. One takeaway from the mixed findings in this emerging literature is that research should differentiate by type of crime and type of institutions, which I do in the analyses that follow.

My extension of this literature is to examine the influence of spatial proximity to organizations on the reoffending behavior of juvenile offenders. I examine the

organizational infrastructure, accessible by walking, of a juvenile offenders' residential community, as it influences risk of repeat offending overall and for status/public peace charges, property charges, and violent/drug offense. As Stein et al. (2016) observed in a recent study on police calls, there are pockets within aggregate neighborhoods where disorder is predictive of crime that warrants taking a closer look at residential neighborhoods such as those within walking distance of an offenders' home, rather than using large, administrative boundaries.

Very little is known about the residential communities of juvenile offenders who have successfully completed their supervision and/or court-ordered consequences. The few studies that have explored neighborhood context and juvenile recidivism have done so using immigrant concentration (Wright and Rodriguez 2014) socioeconomic disadvantage or social capital measures (Grunwald et al. 2010) and the nearby presence of juvenile offenders (Mennis et al. 2011). Findings from this handful of studies suggests that neighborhood context can influence risk of recidivism, but differentiation by type of offense is crucial. There is insufficient empirical work on juvenile offending patterns to predict which types of offenses are more sensitive than others to the organizations in the neighborhood. Nevertheless, theories of juvenile delinquency, as elaborated fully in the literature review, suggest that organizations may influence youth behavior directly or indirectly to invoke formal or social control on juvenile behavior.

In Chapter 2, I introduced a typology of seven types of organizations in my dataset I expected to influence juvenile reoffending behavior. I differentiated the type of influence (formal or social control) and whether it is proximate or distal. This typology provides a framework for thinking about which organizations to include and why. My

categories include: library/community centers, (middle/junior/high schools, public parks, detention/police facilities, social services, civic/membership/voluntary, and religious congregation/ministry organizations. I provided a detailed explanation of the theorized influence of each subtype of organization informed by theories of juvenile delinquency and empirical research on crime and organizations. In brief, these establishment types can be divided by predicted direction of influence into two groups: *risk enhancers and risk reducers.*

Risk Enhancers. Public parks and non-elementary school campuses have been described as "contested spaces" in the literature on criminogenic facilities (Slocum et al. 2013; Groff and Lockwood 2010) While some activities at these locales are supervised and regulated (e.g., Little League games, school clubs and academic activities), researchers have found that both parks and schools can enhance risk of crime because they bring together motivated offenders and targets without adequate supervision. It is well documented that schools are places of where juvenile victimization occurs, as well as formal instruction and socialization. Similarly, parks can be assets to the community but can also deteriorate into places where illicit activity occurs.

Risk Reducers. Library/community centers, social services, civic/membership/voluntary associations, and religious congregations/ministries are predicted to serve as risk reducers because they provide either direct oversight, or provide resources to individuals and the collective community that encourage conformity and discourage delinquency. For example, the presence of a detention/police facility functions as a deterrent because it provides supervision over local activities. Other entities offer services for youth (e.g. YMCA recreation activities) or build collective

efficacy and trust between neighbors (e.g., civic/membership/voluntary associations). Detention/police centers are also theorized to reduce recidivism by providing a deterrent effect in the area. However, this type of formal control is targeted towards crime management and prevention specifically, rather than generating collective efficacy or ties that bind.

This chapter is first to test these general predictions using geographical data on organizations accessible within walking distance of a reentering juvenile offender. The following hypotheses guide this chapter:

H2: Reentering juvenile offenders with spatial access to more 'risk reduction' organizations will have a lower risk of recidivism, controlling for neighborhood disadvantage and individual characteristics.

H3: Reentering juvenile offenders with spatial access to more 'risk enhancing' will have a higher risk of recidivism, controlling for neighborhood disadvantage and individual characteristics.

Although I expect these hypotheses to be supported in general, there may be variation by juvenile population and by type of new offense as was observed in the previous chapter.

Methodology

Cox Proportional Hazard Models.

I report Cox proportional hazard models for competing risk to assess the relative risk of offenders to repeat offend for any type of new offense and for specific offenses. Cox proportional hazard models use a two-part outcome accounting for event occurrence

(yes/no) and time to event (measured in days) which is an improvement over recidivism models using a dummy variable outcome. The model is expressed below, where

$$y = \alpha + J\beta_j + \varepsilon$$

y is the time until recidivism or right censoring (one year after release in models for all types and recidivism for another offense in offense-specific models), α is the intercept, J is a matrix of juvenile offender predictors including youth characteristics, as well as the counts of organizations within 15-minute walking distance of the residential address of the juvenile, which have a vector of β_j on time to recidivism. The models by type of new offense account for competing risk. Youth remain in the risk pool until the end of the study period (366 days post release) or until they repeat offend. Youth who repeat offend for a different type of new offense that the focal model (e.g., property charge in status/peace model) are right-censored from the model (Allison 2014).

Buffer Analysis

This chapter adds a count of the organizations by type accessible within a 15-minute walking buffer of each juvenile offenders' approximate residential address. One advantage of having point level data for both reentering juvenile offenders and for organizations is that I can produce individual-level measures of organizational access, rather than aggregating to administrative boundaries such as the census tract that have been traditionally used in many studies of neighborhood effects. A buffer approach provides a finer grained analysis than aggregating up to the tracts-level; the problems with aggregate tract-level counts have been noted (Downey 2016). An offender may live on the far side of a large tract, in which case a large public park on the opposite side of the census tract may have no bearing on their daily activities.

The network analyst tool in ArcGIS allowed me to generate a count of the organizations readily accessible within the youth's local neighborhood. This tool uses the street grid to create a buffer around each reentering juvenile offenders' residential point (approximate for anonymity) for the distance they can travel within 15 minutes[32]. My rationale for a 15-minute boundary was to obtain a localized measure of the youthful offenders' neighborhood that could be accessed by walking a short distance, though I tested various buffer sizes as a robustness check on my findings.

I conducted two sets of analyses to assess the influence of spatial proximity to organizations on repeat juvenile offending by type. In the first series of analyses, I examined the association that differentiated by the seven organization types described in previous chapters: library/community center, middle/high school, public park, social services, civic/membership/voluntary, and religious congregations/ministries. As a robustness check of these findings, I also examined aggregate categories of total number of organizations, the number of risk reducer, risk enhancing, and police/detention facilities.

Data and Measures

Individual juvenile offender data were obtained from Maricopa County Juvenile Probation office as described in detail in the methodology chapter. I analyzed juveniles who completed probation or diversion in 2007, and who had a valid residential address that was geocoded to a point near their place of residence within the study area (N=6,730 for diversion and N=1,608 for probation). I included predictors for individual risk of

[32] I generated buffers for 5, 10, and 30 minutes as a comparison as reported later as a robustness test. The distribution of organizations at a 5-minute buffer was too small to be meaningful (a mean of 1 organization per youth).

recidivism associated with repeat offending likelihood including: gender, race, age at first offense, time served in juvenile detention, and prior offense history. Recidivism was measured by the first new offense incurred within one year of completion. I included a composite disadvantage score using data from the American Community Survey estimates of 2005-2009 which was assigned to juvenile offenders based on their census tract. I used robust standard errors to account for juveniles nested in the same census tracts[33]. The organization data are described in detail in the methodology chapter.

Table 6-1 reports descriptive statistics for offender characteristics, neighborhood disadvantage, and organizations accessible within 15-minutes of each offenders' home. The individual characteristics and recidivism risks are described in detail in the previous chapter, so I focus here on the individual-level organization counts accessible within 15-minutes walking distance.

I used a combination of dummy variables and continuous variables based on the distribution of the organizations. For the aggregate categories, I used one measure to account for the combined *risk reduction* organizations (library/centers, social services, civic/membership/voluntary, and religious) and a binary to account for the presence of a *risk enhancing* organization (school or park) and a binary measure for the presence of a police/detention facility. I also had a separate measure for the total number of the organizations across all seven categories. The protective and total organization measures were highly skewed, so I used a square root transformation in my models, but I provided the counts in the descriptive table for substantive interpretation. I used dichotomous

[33]This is the same approach used by Mennis and Harris (2011) to examine recidivism and juvenile offender contagion.

variables for public libraries/community centers, middle/high schools, public parks, and detention/police facilities where a 1 indicated one or more facilities within a 15-minute walking distance. The total number of organizations was used for social services, civic/membership/voluntary, and religious facilities. Tables 6-3 and 6-4 show the correlation between the organizations by type and other measures in the models. I did not find problematic multicollinearity between organization measures[34].

[34] Mean and individual VIF measures less than 2.

Table 6-1. Descriptive Statistics of Juvenile Offender Measures and 15 Minute Buffer Measures

	Diversion			Probation			
Individual Measures	**Mean or %**	**SD**	**Range**	**Mean or %**	**SD**	**Range**	**Variable Metric**
Female	42.6%	0.49	0-1	23.4%	0.42	0-1	1=female, 0=male
Hispanic	43.8%	0.50	0-1	46.2%	0.50	0-1	1=Hispanic, 0=other
White (Reference)	40.7%	0.49	0-1	37.6%	0.48	0-1	1=white, 0=other (reference category)
Other Minority	15.4%	0.36	0-1	16.2%	0.37	0-1	1=Black, Native American, Asian, other/unknown, 0=other
Community Service	13.8%	0.35	0-1	45.2%	0.50	0-1	1=completed 10+ hours 0= <10 hours completed
Age at 1st Offense	13.9	1.62	7-16	13	1.64	8-16	Age of juvenile in years
Count of Priors	---	---	---	3.7	2.88	1-21	Count of prior offenses excluding current offense
Any Priors	27.7%	0.45	0-1	---	---	---	1=any prior offenses excluding current offense, 0=none
Prior Status/Peace	---	---	0-1	65.2%	0.48	0-1	1=prior status/peace offense, 0=none
Prior Property	---	---	0-1	66.5%	0.47	0-1	1=prior property offense, 0=none
Prior Violent/Drug	---	---	0-1	49.3%	0.50	0-1	1=prior violent/drug offense, 0=none
Juvenile Detention	---	---	0-1	36.6%	0.48	0-1	1=detention time 24+hours served, 0= <24 hours
Recidivism							
Status/Public Peace	12.3%	0.33	0-1	14.8%	0.36	0-1	1=new status/public peace offense, 0=none (other censored)
Property	5.8%	0.23	0-1	8.4%	0.28	0-1	1=new property offense, 0=none (other censored)
Violent/Drug	5.2%	0.16	0-1	10.4%	0.31	0-1	1=new violent/drug offense, 0=none (other censored)
Any Offense	23.3%	0.42	0-1	33.6%	0.47	0-1	1=new charge all types, 0=no recidivism
Neighborhood							
Census Tract Disadvantage	0.47	1.64	-3.71-7.33	0.61	1.60	-3.71-7.80	Factor score: % unemployed, % in poverty, % female-headed households, % no car, % different household, median household inc.
Organizations (15-Min)							
Library or Center	0.13	0.34	0-1	0.14	0.35	0-1	1=one or more public library/community center 0=none
School	0.26	0.44	0-1	0.26	0.44	0-1	1=one or more non-elementary school 0=none
Park	0.41	0.49	0-1	0.43	0.50	0-1	1=one or more public park 0=none
Detention/Police	0.03	0.16	0-1	0.04	0.19	0-1	1=one or more detention center or police facility 0=none
Social Services	2.04	3.10	0-31	2.03	2.93	0-21	Count of establishments
Civic/Membership/Vol	3.25	3.37	0-43	3.30	3.50	0-53	Count of establishments
Religious	4.58	4.50	0-33	4.72	4.44	0-27	Count of establishments
"Risk Reducers"	10.06	9.30	0-102	10.24	9.22	0-97	Count of lib/cent, social serv, civic/membership, religious establishments
"Risk Enhancers"	0.53	0.50	0-1	0.56	0.49	0-1	1=one or more park or school 0=none
All Orgs	10.99	9.90	0-109	11.21	9.80	0-100	Count of all establishments
Juvenile Offenders N=	**6,730**			**1,608**			

Table 6-2. Buffer Counts of Organizations at 10, 15 and 30 Minute Walking Buffers

	Diversion			Probation		
Organization Counts	**Mean or %**	**SD**	**Range**	**Mean or %**	**SD**	**Range**
10-Minute						
Protective (#)	3.27	3.75	0-37	3.31	3.69	0-27
Risk Orgs (0/1)	0.25	0.43	0-1	0.24	0.46	0-1
Detention/Police (0/1)	0.006	0.08	0-1	0.01	0.09	0-1
All Orgs (#)	3.59	3.97	0-38	3.61	3.91	0-27
15-Minute						
Protective (#)	10.06	9.30	0-102	10.24	9.22	0-97
Risk Orgs (0/1)	0.53	0.50	0-1	0.56	0.49	0-1
Detention/Police (0/1)	0.03	0.16	0-1	0.04	0.19	0-1
All Orgs (#)	10.99	9.90	0-109	11.21	9.80	0-100
30-Minute						
Protective (#)	37.82	30.04	0-235	38.19	30.62	0-251
Risk Orgs (0/1)	0.85	0.36	0-1	0.87	0.33	0-1
Detention/Police (0/1)	0.12	0.33	0-1	0.13	0.34	0-1
All Orgs (#)	41.1	31.72	0-253	41.68	32.41	0-267
Juvenile Offenders N=	**6,730**			**1,608**		

Table 6-3. Pearson's Correlation Matrix of Buffer Measures: Diversion Youth

	Recid	Lib/Cent	School	Park	Det/Pol	SocS	Civic	Religious	Female	Hispanic	Other Race	Comm Serv	Age at 1st	Prior	Disadv
Recidivism	1														
Library/Center	-0.0148	1													
School	0.0136	0.0907*	1												
Park	0.0134	0.2743*	0.1451*	1											
Det/Pol	0.0176	0.1698*	0.0155	0.0984*	1										
Social Serv	0.0073	0.2567*	0.1741*	0.1915*	0.1137*	1									
Civic	-0.0051	0.2195*	0.2031*	0.2175*	0.1007*	0.6112*	1								
Religious	0.0016	0.3003*	0.2466*	0.2846*	0.1337*	0.5287*	0.4635*	1							
Female	-0.1249*	0.0083	0.017	0.0029	-0.0198	0.0401*	0.0222	0.0146	1						
Hispanic	0.0331*	0.1223*	0.1148*	0.0831*	0.0577*	0.0715*	0.0071	0.2037*	-0.0044	1					
Other Race	-0.0263*	0.0007	-0.0142	-0.0044	-0.0250*	0.0267*	0.0351*	-0.014	0.0187	-0.3775*	1				
Comm Serv	0.0060	0.0227	-0.0092	0.0004	0.0055	-0.0111	-0.0222	-0.0044	-0.0295*	0.0073	-0.0201	1			
Age at 1st	-0.0164	-0.0467*	-0.0089	-0.0393*	-0.023	-0.0512*	-0.0376*	-0.0682*	0.0353*	-0.0809*	-0.0791*	-0.0017	1		
Any Priors	0.1900*	0.0141	0.0079	0.0241*	0.0063	-0.0033	0.0019	0.0214	-0.0578*	0.0613*	-0.0379*	0.1705*	-0.1917*	1	
Disadvantage	0.0068	0.2713*	0.1742*	0.2265*	0.0751*	0.2805*	0.2099*	0.4409*	0.0310*	0.4013*	0.0524*	0.0058	-0.1634*	0.0591*	1

Table 6-4. Pearson's Correlation Matrix of Buffer Measures: Probation Youth

	Recid	Lib/Cent	School	Park	Det/Pol	SocS	Civic	Religious	Female	Hispanic	Other	Com Serv	Age 1st	Priors	Juvie	Disadv
Recid	1															
Lib/Cent	0.008	1														
School	-0.0833*	0.1043*	1													
Park	-0.0046	0.2735*	0.1122*	1												
Det/Pol	-0.0146	0.2135*	-0.0168	0.0880*	1											
SocS	-0.0126	0.2759*	0.2060*	0.1985*	0.1531*	1										
Civic	-0.0426	0.2488*	0.2083*	0.2314*	0.1424*	0.6161*	1									
Religious	-0.0075	0.3016*	0.2313*	0.2668*	0.1449*	0.5229*	0.4647*	1								
Female	-0.1044*	-0.0126	0.0518*	-0.0233	0.0093	0.0399	0.0265	0.0075	1							
Hispanic	0.0277	0.1133*	0.0677*	0.0453	0.0829*	0.0641*	0.0081	0.1893*	-0.0595*	1						
Other Race	0.0275	-0.0464	-0.0589*	-0.0137	-0.0277	-0.0258	-0.0117	-0.0754*	0.0560*	-0.4070*	1					
Comm Serv	-0.0348	0.0317	0.014	0.01	-0.0096	-0.0225	-0.0385	-0.0369	-0.0308	0.0328	-0.0256	1				
Age at 1st	-0.0504*	0.0245	0.0205	0.0148	0.0125	0.0064	-0.0142	0.0523*	0.0173	0.0157	-0.0509*	0.0279	1			
Count Priors	0.1752*	0.0317	-0.0137	0.0218	0.0163	0.0196	0.0029	0.0166	-0.0548*	0.0355	0.0035	-0.2288*	-0.3177*	1		
Juvie	0.1081*	0.0273	-0.021	0.0323	0.033	0.0301	0.0083	0.0411	-0.0605*	0.0267	0.0488	-0.2149*	-0.1398*	0.5655*	1	
Disadvantage	0.0278	0.2638*	0.1506*	0.2342*	0.1037*	0.2838*	0.2340*	0.4338*	0.0186	0.3296*	0.0063	-0.0199	-0.0284	0.0856*	0.0931*	1

On average, juvenile offenders completing diversion and probation had nearly 11 total organizations of the specified types accessible within 15 minutes walking distance from their home (mean of 10.99 and 11.21, respectively)[35]. Most juveniles had at least one of the specified organizations nearby; only 5.2% of diversion and 6.34% of probation had no organizations in their 15-minute walking radius. For organizations theorized to reduce risk or repeat offending, religious establishments were the most widely accessible, with a mean of 4.58 for diversion and 4.72 for probation. The mean number of social services and civic/membership/voluntary associations were comparable for both juvenile populations. On average, each youth had roughly two social service agencies and about three civic/membership/voluntary nearby. Libraries and community centers were less common. Thirteen percent of diversion and 14% of probation youth could walk to a neighborhood library or community center.

Schools and parks, theorized to increase risk of repeat recidivism as 'risk enhancers,' were more common. More than half of the juveniles had at least one park or school in their neighborhood (53% and 56%, respectively). However, when dividing out by subgroup, nearly three-quarters of the youth did *not* have a middle school or high school within walking distance of home[36]. Finally, detention/police facilities were the least common, with only 3% of diversion and 4% of probation youth residing within walking distance of these entities.

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[35] Table 6-2 displays the aggregate counts for 10, 15 and 30-minute buffers for comparison. Within 10 minutes, the average number of total organizations was around 3 for diversion probation with a range of 0-27. At 15 minutes, the mean number is roughly 11 with a range up to about 100 establishments. At 30 minutes, the mean number of organizations is more than double that of the 15-minute buffer zone with a range up to 267 for the highest bound.

[36] Arizona is an interesting case for school proximity where driving or commuting by bus may be more common than the walkable neighborhood school model. School and school choice policies allow students to open enroll into public schools that are not in their zoned district.

Table 6-5. Hazard Ratios of Recidivism by New Offense Type for Diversion Youth with Buffer Counts

	All Types						Status/Peace					
	1		2		3		4		5		6	
Individual	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.598***	(.033)	0.599***	(.034)	0.597***	(.034)	0.744***	(.054)	0.746***	(.056)	0.744***	(.056)
Hispanic	1.088	(.060)	1.102	(.068)	1.100	(.069)	1.209*	(.090)	1.267**	(.104)	1.259**	(.104)
Other Race	0.942	(.075)	0.950	(.082)	0.951	(.081)	0.732*	(.089)	0.754*	(.086)	0.753*	(.086)
Comm. Service	0.831*	(.061)	0.832*	(.063)	0.833*	(.063)	0.735**	(.079)	0.735**	(.073)	0.735**	(.073)
Age at 1st	1.035*	(.016)	1.034*	(.016)	1.035*	(.016)	1.135**	(.049)	1.131**	(.046)	1.131**	(.046)
Any Priors	3.379***	(.321)	3.381***	(.325)	3.384***	(.326)	3.026***	(.418)	3.033***	(.424)	3.026***	(.423)
Time-Varying												
Time*Any Priors	0.998***	(.000)	0.998***	(.000)	0.998***	(.000)	0.998**	(.001)	0.998**	(.000)	0.998**	(.000)
Time*Age at 1st							0.999*	(.000)	0.999**	(.000)	0.999**	(.000)
Buffer Counts												
Library/Cent (0/1)					0.864	(.077)					0.934	(.115)
School (0/1)					1.064	(.062)					1.047	(.080)
Public Park (0/1)					1.058	(.061)					1.144†	(.085)
Detent/Police (0/1)					1.210	(.175)					0.986	(.222)
Social Services (#)					1.021†	(.083)					1.020	(.018)
Civic/Member (#)					0.990	(.010)					0.980	(.014)
Religious (#)					0.994	(.007)					0.990	(.009)
Neighborhood												
Disadvantage			0.992	(.020)	0.992	(.021)			0.971	(.023)	0.974	(.025)
Recidivism N=	1,568		1,568		1,568		826		826		826	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001. N=6,730 juvenile offenders, N=2,151,267 time at risk spells.
Time-vary predictors were included based on proportional hazards assumption tests (phtest) and visually inspecting smoothed hazard estimate charts for variables that failed the phtest at p <.05. Robust standard errors using Stata clustering by census tract were used for models with disadvantage measure. In Models by specific offense, offenders recidivating for a new offense other than the focal offense type were right-censored (see in-text description of modeling competing risk).

Table 6-5 Continued. Hazard Ratios of Recidivism by New Offense Type for Diversion with Buffer Counts

	Property						Violent/Drug					
	6		7		8		9		10		11	
Individual	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.544***	(.060)	0.537***	(.064)	0.534***	(.064)	0.372***	(.048)	0.375***	(.049)	0.375***	(.049)
Hispanic	1.173	(.134)	1.030	(.135)	1.039	(.138)	0.777*	(.091)	0.860	(.118)	0.857	(.119)
Other Race	1.529**	(.219)	1.408*	(.205)	1.418*	(.206)	0.858	(.139)	0.915	(.147)	0.912	(.146)
Comm. Service	0.912	(.129)	0.908	(.129)	0.915	(.131)	0.970	(.141)	0.972	(.152)	0.974	(.152)
Age at 1st	1.062†	(.034)	1.071*	(.032)	1.073*	(.031)	1.001	(.032)	0.995	(.031)	0.995	(.031)
Any Priors	4.252***	(.781)	4.226***	(.788)	4.250***	(.793)	2.721***	(.304)	2.734***	(.311)	2.739***	(.312)
Time-Varying												
Time*Any Priors	0.996***	(.001)	0.996***	(.001)	0.996***	(.001)						
Time*Age at 1st												
Buffer Counts												
Library/Cent (0/1)					0.885	(.127)					0.664*	(.134)
School (0/1)					0.994	(.116)					1.223	(.161)
Public Park (0/1)					0.971	(.106)					0.975	(.120)
Detent/Police (0/1)					1.131	(.316)					1.950**	(.453)
Social Services (#)					1.026	(.018)					1.014	(.024)
Civic/Member (#)					1.001	(.015)					0.997	(.022)
Religious (#)					1.018	(.014)					0.973	(.019)
Neighborhood												
Disadvantage			1.085*	(.036)	1.052	(.041)			0.935	(.039)	0.935	(.039)
Recidivism N=	393		393		393		349		349		349	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001. N=6,730 juvenile offenders, N=2,151,267 time at risk spells.

Table 6-6. Hazard Ratios of Recidivism by New Offense Type for Probation Youth with Buffer Counts

	All Types						Status/Peace					
	1		2		3		4		5		6	
Individual	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.658***	(.076)	0.658***	(.079)	0.669***	(.081)	0.930	(.144)	0.934	(.144)	0.962	(.157)
Hispanic	1.134	(.109)	1.124	(.116)	1.108	(.115)	1.268†	(.181)	1.342†	(.181)	1.364*	(.209)
Other Race	1.226	(.156)	1.219	(.154)	1.182	(.150)	0.328*	(.162)	0.339*	(.162)	0.328*	(.142)
Comm. Service	1.022	(.093)	1.023	(.095)	1.018	(.094)	1.251†	(.169)	1.249†	(.169)	1.237	(.162)
Age at 1st	1.002	(.028)	1.002	(.030)	1.001	(.029)	1.115*	(.050)	1.114*	(.050)	1.115*	(.051)
Count of Priors	1.089***	(.018)	1.089***	(.020)	1.087***	(.020)	1.010**	(.031)	1.099**	(.031)	1.096**	(.032)
Juv. Detention	1.043	(.113)	1.042	(.121)	1.032	(.120)	0.627**	(.106)	0.634*	(.106)	0.630**	(.114)
Prior Status/Peace							1.592**	(.272)	1.602**	(.272)	1.603**	(.288)
Time-Varying												
Time*Other Race							1.005*	(.002)	1.005**	(.002)	1.005**	(.002)
Time*Age at 1st												
Time*Comm. Serv.												
Time*Prior V/D												
Buffer Counts												
Library/Center (0/1)					1.049	(.123)					1.179	(.217)
School (0/1)					0.742†	(.087)					0.643*	(.114)
Public Park (0/1)					1.006	(.093)					1.146	(.159)
Detent/Police (0/1)					0.852	(.188)					0.567	(.227)
Social Services (#)					1.015	(.020)					1.030	(.033)
Civic/Member (#)					0.974	(.016)					0.989	(.027)
Religious (#)					1.002	(.013)					0.984	(.019)
Neighborhood												
Disadvantage			1.007	(.032)	1.007	(.032)			0.957	(.046)	0.970	(.051)
Recidivism N=	540		540		540		238		238		238	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001. N=1,608 juvenile offenders, N=485,589 time at risk spells. Time-vary predictors were included based on proportional hazards assumption tests (phtest) and visually inspecting smoothed hazard estimate charts for variables that failed the phtest at p <.05. Robust standard errors using Stata clustering by census tract were used for models with disadvantage measure. In Models predicting specific types of recidivism, offenders recidivating for a new offense other than the focal offense type were right-censored.

Table 6-6 Continued. Hazard Ratios of Recidivism by New Offense Type for Probation

	Property						Violent/Drug					
	7		8		9		10		11		12	
Individual	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE
Female	0.507**	(.130)	0.496**	(.125)	0.502**	(.127)	0.401***	(.098)	0.402**	(.109)	0.403**	(.109)
Hispanic	0.852	(.169)	0.747	(.159)	0.714	(.153)	1.140	(.202)	1.160	(.231)	1.132	(.226)
Other Race	1.456	(.333)	1.346	(.316)	1.371	(.321)	1.442†	(.317)	1.457†	(.299)	1.393	(.285)
Comm. Service	0.786	(.150)	0.805	(.150)	0.810	(.152)	2.107*	(.664)	2.103*	(.671)	2.131*	(.682)
Age at 1st	0.908†	(.048)	0.906†	(050)	1.046	(.116)	0.960	(.047)	0.960	(.053)	0.963	(.052)
Count of Priors	1.042	(.034)	1.040	(.031)	1.044	(.031)	1.057†	(.033)	1.057†	(.035)	1.058†	(.036)
Juv. Detention	1.968**	(.425)	1.938**	(.396)	1.923**	(.392)	1.174	(.231)	1.176	(.266)	1.150	(.264)
Prior Property	1.309	(.277)	1.278	(.269)	1.276	(.265)						
Prior Violent/Drug							2.325*	(.760)	2.315**	(.736)	2.354**	(.746)
Time-Varying												
Time*Other Race												
Time*Age at 1st					0.999†	(.000)						
Time*Comm. Serv.							0.995**	(.002)	0.995**	(.002)	0.995**	(.002)
Time*Prior V/D							0.996*	(.002)	0.996*	(.002)	0.996*	(.002)
Buffer Counts												
Library/Center (0/1)					1.243	(.260)					0.695	(.215)
School (0/1)					1.017	(.201)					0.703	(.162)
Public Park (0/1)					0.854	(.160)					0.949	(.485)
Detent/Police (0/1)					1.093	(.387)					1.171	(.485)
Social Services (#)					0.927†	(.041)					1.063†	(.037)
Civic/Member (#)					0.997	(.032)					0.934*	(.030)
Religious (#)					1.037	(.026)					0.999	(.026)
Neighborhood												
Disadvantage			1.113*	(.060)	1.110†	(.068)			0.987	(.062)	0.987	(.062)
Recidivism N=	135		135		135		167		167		167	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001. N=1,608 juvenile offenders, N=485,589 time at risk spells.

Findings

Tables 6-5 and 6-6 report the hazard ratios of recidivism risk for offenders who completed diversion and probation in 2007. For ease of comparison with the outcomes from Chapter 5, the first two models for each subtype of recidivism (e.g., all types, status/peace, property, violent/drug) report the effects of individual characteristics and overall neighborhood disadvantage. The third column for each subtype adds the organization counts within each offender's residential buffer. I describe the influence of specific organizations below organized by type of new offense.

All Types of Recidivism

Model 3 in Tables 6-5 and 6-6 report the hazard ratios that a reentering youth from diversion and probation, respectively, will incur a new offense in any of the three categories within one year of their completion date. Only one organizational measure was marginally significant in each model, and the effects were in the opposite direction of my predictions. For diversion youth, having social service agencies nearby was positively associated with recidivism (HR=1.021, p<.10) which is the opposite of the predicted protective effect. For probation youth, the presence of a nearby middle/high school was negatively associated with repeat offending likelihood (HR=.742, p<.10). The measure for neighborhood disadvantage remained unrelated to recidivism risk when examining all offense types in the final model.

Status/Public Peace Recidivism

The influence of nearby organizations was also mixed between juvenile populations in the model predicting new status/peace offenses (Model 6 in Table 6-5 and 6-6). For diversion youth, the influence of one or more public parks in the walking buffer

was positive and marginally significant (HR=1.144, p<.10). For probation youth, in contrast to the predicted direction, youth with at least one middle or high school within walking distance of the juvenile's home saw a reduction in status/public peace offense likelihood by 35.7%. (HR=.643). The aggregate disadvantage score was not predictive of status/public peace recidivism for either population of youthful offenders. Individual variables remained the most consistent predictors in the final models.

Property Recidivism

Findings related to property recidivism are reported in Models 9 in Table 6-5 and 6-6. Diversion youth property recidivism was not influenced by any of the neighborhood context predictors. The overall neighborhood disadvantage score was reduced to non-significance and no organization predictors were related to recidivism risk. For probation youth, only two neighborhood predictors remained marginally significant and in the opposite direction. The measure for neighborhood disadvantage, though reduced in magnitude and significance, indicated a positive association with property reoffending risk (HR=1.110, p<.10). The number of social service agencies was negatively associated with probation youth property recidivism, but marginally significant. Each additional social service agency reduced the hazard ratio by 7.3% (HR=.927, p<.10).

Violent/Drug Recidivism

The findings related to violent/drug recidivism reported in Tables 6-5 and 6-6, Model 12. Two different organization measures were significant predictors of violent/drug recidivism for each juvenile population. Diversion youth who lived within walking distance of one or more public library or community center were 33.6% less

likely to repeat offend for a violent/drug charge. Detention/police facility access, however, nearly doubled the risk of violent/drug recidivism for low-level, diversion tract offenders (HR=1.950).

A different subset of organizations was associated with violent/drug recidivism for youth ending probation. Civic and membership organizations reduced reoffending risk. Each additional civic/membership organization within walking proximity of an offenders' home reduced the risk of a repeat drug/offense complaint for by 6.6% (HR=.934). A marginally significant term for social services was associated with an increase, rather than decrease in recidivism risk with each additional organization within the buffer area (HR=1.063, p<.10). Overall neighborhood disadvantage was not significant.

Table 6-7 summarizes the organization subtypes and direction of influence by type of new offense and juvenile offender population. Notably, there was no single organization category that was influential across all models. The type of organization, direction of influence, and magnitude of the effect differed depending upon the juvenile offender population (i.e. diversion v. probation) and the type of new offense predicted (all types, status/public peace, property, drug/violent). I predicted that parks/schools would serve as risk enhancers while libraries/community centers, social services, religious congregations/ministries, civic/membership/voluntary, and detention/police centers would reduce the risk of recidivism. My findings, however, did not fit neatly into these categories as I predicted. Instead, analyses that differentiated by each type of organization offered some insights into which types of entities matter for which types of juvenile behaviors. Except for religious establishments, which did not have an

association with juvenile recidivism in any of the models, other categories of organizations were at least marginally significant in influencing recidivism, though not always in the expected direction across models.

Table 6-7. Direction of Organization Effect by Juvenile Population and Recidivism Type

Recidivism	**Diversion**	**Probation**
Any Type	Social Services (+)*	Middle/High School* (-)
Status/Public Peace	Public Park (+)	Middle/High School (-)
Property	*None*	Social Services (-)*
Violent/Drug	Library/Community Center (-) Detention/Police (+)	Social Services (+)* Civic/Membership (-)

Notes: * p<.10

Robustness Tests Using Aggregate Categories

As a check on these findings, I reran the models using aggregate categories of organization. I may not have observed strong consistent findings because organization categories were too fine-grained. The idea is that the cumulative effect of having many organizations or few organizations matters more rather than the presence or absence of specific organizations. Table 6-2 shown earlier, reports the count comparisons for the 10, 15 and 30-minute walking buffers. The findings were generally consistent over buffer size, so I reported the 15-minute outcomes in the tables and noted any divergent findings in the text.

Table 6-8 reports the 15-minute buffer findings by population and offense type using aggregate categories. I reran the individual recidivism models from Tables 6-5 and

6-6 with a measure of all organizations, as well as by aggregate types. The first column of each section reports the influence of 1) number of *risk reducing organizations* 2) *a risk enhancing organization* (school/park) and 3) the presence of a surveillance entity (detention/police) in the buffer, net of individual predictors. The second column includes only a single indicator for all organizations combined. I used a square root transformation for the number of protective organizations and all organizations to address the skewed distribution of the data. Binary measures were optimal to account for school/parks as a potential risk, and detention/police as surveillance. For simplicity, Table 6-8 shows only the organization measures.

Table 6-8. Partial Table of Hazard Ratios of Recidivism by Type with Combined Organization Categories

	Any Recidivism (15-min)								Status/Public Peace (15-min)							
	1. Diversion				2. Probation				3. Diversion				4. Probation			
Buffer Counts	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE
Protect Orgs (Sqrt #)	1.006	(.022)			0.967	(.033)			0.969	(.028)			0.985	(.052)		
Risk Orgs (0/1)	1.027	(.058)			0.952	(.094)			1.118	(.082)			1.081	(.156)		
Detention/Pol (0/1)	1.171	(.165)			0.901	(.202)			0.971	(.224)			0.631	(.251)		
All Orgs (Sqrt #)			1.011	(.021)			0.953	(.029)			0.998	(.026)			0.983	(.048)
Neighborhood																
Disadvantage	0.986	(.020)	0.987	(.020)	1.028	(.033)	1.029	(.033)	0.969	(.024)	0.972	(.025)	0.961	(.052)	0.964	(.053)
Recidivism N=	1,568		1,568		540		541		826		826		238		238	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001. Individual-level predictors not shown but included in the models as in Tables 6-5 and 6-6.
Findings for 10-minute and 30-minute buffers (not shown) were not significant.

Table 6-8 Continued. Partial Table of Hazard Ratio of Recidivism by Type with Combined Organization Categories

	Property (15-min)								Violent/Drug (15-min)							
	5. Diversion				6. Probation				7. Diversion				8. Probation			
Buffer Counts	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE	HR	SE
Protect Orgs (Rt #)	1.107*	(.047)			1.016	(.073)			0.950	(.041)			0.903	(.063)		
Risk Orgs (0/1)	0.953	(.103)			0.817	(.162)			0.924	(.114)			0.876	(.155)		
Detention/Pol (0/1)	1.101	(.302)			1.056	(.377)			1.787*	(.425)			1.180	(.467)		
All Orgs (Sqrt #)			1.092*	(.045)			0.993	(.065)			0.954	(.040)			0.878†	(.058)
Neighborhood																
Disadvantage	1.047	(.039)	1.048	(.039)	1.128*	(.066)	1.117†	(.067)	0.956	(.042)	0.953	(.042)	1.043	(.061)	1.047	(.061)
Recidivism N=	393		393		135		135		349		349		167		167	

Notes: † p<.10, * p <.05, **p <.01, *** p<.001. Individual-level predictors not shown but included in the models as in Tables 6-5 and 6-6.

In general, using aggregate organization categories did not improve the interpretability of the findings. None of the aggregate organization predictors were statistically significant in predicting any type of new offense or status/public peace offense. The total number of organizations was not significantly associated with recidivism risk at 10, 15 and 30 minute buffers for diversion and probation offenders across three of the four of new offense categories[37] Consistent with the previously reported finding, violent/drug recidivism for diversion youth was enhanced by the presence of a detention/police facility nearby (HR=1.787)[38]. However, other findings from the subgroup analyses largely disappeared when aggregated into groups providing support for the idea that it is not just the number of organizations but rather the specific types accessible.

One departure from this trend, however, was observed in the models predicting juvenile property offending. In the subgroup models reported in Tables 6-5 and 6-6, there were no significant organization predictors that enhanced or reduced risk of repeat property complaints for juveniles ending diversion. Yet, in combining all organizations together, the number of establishments was positively associated with recidivism risk (HR=1.092)[39].

To summarize, my key findings from this chapter are as follows.

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[37] Findings for 10-minute and 30-minute buffers are not shown. Nothing was significant except as reported in the text.
[38] This finding was largest the 10-minute buffer (HR=2.40) but disappeared at 30 minutes, which indicates the influence of detention-police decays over distance.
[39] This measure was also significant at the 30-minute buffer (not shown) but reduced in magnitude (HR=1.053).

1. Neighborhood disadvantage was not associated with repeat offending across any models, after accounting for individual characteristics and nearby organizations.
2. Specific organization subgroups were associated with risk of status/peace and violent/drug recidivism.
   - The risk of status/peace recidivism for diversion youth was enhanced by the presence of a park nearby. For probation youth, status/peace recidivism was reduced with the presence of a middle/high school in the neighborhood.
   - The risk of violent/drug recidivism was reduced for diversion youth with a library/community center nearby. However, the presence of a detention/police facility nearly doubled their risk.
   - For probation youth with more civic/membership/voluntary establishments nearby, the risk of violent/drug recidivism was reduced.
3. The total number of community organizations or aggregate measures of 'risk enhancing' or 'risk reducing' facilities within walking distance of an offenders' home were not robust predictors of recidivism, except for diversion offender property recidivism. Youth ending diversion with spatial proximity to more total establishments had a higher likelihood of a new property change than those with fewer establishments nearby.
4. Individual demographic and offense history measures remained the strongest predictors of repeat recidivism, after accounting for contextual variables.

Discussion/Conclusion

The key contribution of this chapter was to examine the potential influence of spatial proximity to specific organizations on subsequent delinquent behavior in low-level and more serious juvenile offenders after their successful completion of supervision or consequences. A prolific neighborhood effects cannon of work has noted the importance of residential neighborhood in determining life opportunities and challenges, but critics have acknowledged the lack of specificity in determining *why* neighborhoods matter. Although many scholars have examined the likelihood of repeat offending behavior based on individual characteristics such as demographics and offense history, few studies have examined the role of neighborhood context in amplifying or reducing environmental risks. This is the first study, to my knowledge, to examine both aggregate neighborhood disadvantage and organizations at the individual level to predict recidivism risk by type of new offense. The premise is that local environments, such as those captured in both socioeconomic and institutional infrastructure measures, shape the routine activities of juvenile offenders that can lead them into or away from opportunities for crime or into contact with capable guardians to supervise their activities. To account for the youth's local environment, I examined whether the number and type of organizations accessible within 15 minutes of their residence reduced or increased the risk of new offenses. In general, the findings from this research suggest only a modest effect of some organizations in the community, rather than the 'risk enhancing' and 'risk reducing' effects as predicted. Further, these limited findings held only for specific types of offending. Notably, these associations align with current scholarship suggesting specificity in studies of organizational proximity and offender behavior, rather than

aggregate measures and outcomes are preferred (Houser et al. 2018; Slocum et al. 2013). I elaborate the key implications of these findings below.

Individual Offender Characteristics

Although the focus of this chapter is on neighborhood effects, it is important to note that offender characteristics and offense history remained strongest, and most consistent predictors of juvenile recidivism, even after accounting for neighborhood disadvantage and nearby organizations. These findings were reviewed thoroughly in the previous chapter and support the prevailing focus of juvenile recidivism scholarship that individual demographic and past offending patterns are the most important predictors of future risk (Cottle et al. 2001).

Neighborhood Disadvantage: Limited Impact

My results related to neighborhood disadvantage failed to support the predictions of social disorganization theory. Aggregate neighborhood disadvantage was unrelated to the risk of recidivism for any new offense, status/public peace or violent/drug offenses, within one year of supervision end for reentering youth from diversion and probation. Only one type of recidivism, for new property complaints, was influenced by aggregate neighborhood disadvantage when this was the only community context predictor in the model as reported in the previous chapter. However, after accounting for access to various organizations in the residential neighborhood, this measure was reduced to marginal significance for diversion offenders and showed no significant association with property recidivism for probation offenders.

These observations align with small but growing literature that suggests neighborhood disadvantage alone fails adequately capture the environmental risks of

crime involvement for adult and juvenile populations. While some research has documented a relationship between neighborhood disadvantage and repeat recidivism (Kubrin and Stewart 2006), others have observed only a limited or null effect (Tillver and Vose 2011; Wang et al. 2014; Zimmerman 2015). Other work has reported the influence of neighborhood disadvantage varies by characteristics of the individuals, such as race or housing (McNeely 2018) or by the type of offense (Grunwald et al. 2010). My findings contribute to this small but growing literature by showing that in the Phoenix metropolitan area, aggregate disadvantage was not a strong predictor of repeat risk of recidivism when both individual characteristics and the organizational composition of the youth offender's immediate residential community are considered.

Different Organizations Matter: Offense-Specific and Population-Specific

My results provided mixed support for my predictions relative to 'risk enhancing' and 'risk reducing' organizations and the influence on juvenile behavior. A few types of organizations nearby were associated with risk of juvenile recidivism, though the effects were limited. Notably, the organization effects varied by type of offense, the category of organizations, and the juvenile population. Specific organization types (e.g., library/community center or middle/high school) influenced individual risk of recidivism for status/public peace and violent/drug complaints, while an overall count of all seven types of organizations nearby increased property recidivism. This general finding aligns with work that suggests organizations are not uniform entities, but rather than provide distinctive functions in the neighborhood that can influence crime behaviors (Slocum et al. 2013; Houser et al 2018; Zimmerman 2015).

I predicted that nearby parks and middle/high schools would function as 'risk enhancing' organizations which would increase the risk of repeat offending. The premise of this argument comes from routine activities approach which suggests that these sites can draw together motivated offenders and opportunities for delinquency without adequate guardian supervision. My results did not support this prediction. The influence of schools and parks were not robust across all types of offending. Rather, having a middle/high school nearby reduced the risk that a probation youth would reoffend for a status/public peace offense, but this measure was not significant in any other models. One possible explanation is that spatial proximity to school campuses facilitates individual school attachment and attendance which are protective factor for delinquency (Henry, Knight, and Thornberry 2012). Further, Burdick-Will (2018) argues that schools not only impact individual youth, but the community at large. She reported that schools function as local anchors which not only generate trust and belong between residents but changed resident perceptions of the geographic boundaries of their neighborhoods when their children attended the nearby school.

My results showed that parks were not robust predictors of repeat risk. The impact of a nearby park on individual recidivism for status/public peace offending was in the expected direction, though only marginally significant and only for diversion offenders. This finding can be contrasted with previous work citing parks as criminogenic places where a disproportionate percent of crime incidence (Groff and McCord 2012; McCord and Houser 2017) relative to other areas in the city. One prior study of spatial proximity to parks and individual outcomes observed that Chicago area youth with a nearby park had a greater likelihood of substance use (Kotlaja et al. 2018).

My findings, however, do not show a strong relationship between nearby parks and repeat delinquency for young offenders in Phoenix.

The influence of ‘risk reducing’ organizations, as theorized, was similarly mixed. There was no single type of protective organization that was influential across all models. Moreover, except for the case of property offending, the combined counts of protective organizations were not meaningful predictors of repeat delinquency. Instead, I found only three of the theorized risk reduction organization types (library/community center, civic/membership/voluntary, police/detention) were significantly associated with recidivism and only for repeat violent/drug offenses. Diversion offenders with a library/community center nearby were less likely to recidivate at any time for violent/drug charges compared to those without a library or community center. Probation offenders saw a protective effect from having more community civic/membership/voluntary organizations nearby. Of the seven subgroups of organizations studied here, libraries/community centers and civic/membership/voluntary organization are the two categories largely dedicated to prosocial development[40]. The libraries/community center category was strictly general use libraries and large, cornerstone community center facilities that serve as anchors for the community such as the YMCA, Boys and Girls Club, or city community recreation center. This was a relatively pure category. In contrast, the civic/voluntary/membership category was quite heterogeneous including entities with direct influence over local neighborhood affairs (e.g. homeowners associations), youth-interest clubs (e.g., little league, parent-teacher

[40] As noted in the methodology chapter, here were comparably fewer public libraries (N=52) and large community centers (N=130) such as the YMCA and Boys and Girls Clubs, across the urban landscape than other types of establishments such as civic/membership/voluntary entities (N=5,134).

organizations), as well as special interest associations with no direct relevance to youth (e.g., toastmasters, animal rescue, art councils). Combined, however, both categories represent the general coming together of community members that is indicative of collective social capital. It is not clear why each category was influential for only one juvenile population and for only violent/drug recidivism. Yet these findings do indicate that youth with spatial proximity to community organizations providing prosocial opportunities for the neighborhood residents benefited from these establishments nearby in a limited way.

My findings align with two recent articles that observed a link between neighborhood context, prosocial bonds, and juvenile violence and repeat offending, respectively. The first article authored by Zimmerman, Welsh, and Posick (2015) examined whether neighborhood youth organizations, such as YMCAs and Boys and Girls Clubs, moderated the influence of low self-control on self-reported youth violence using data from the Chicago Area Project. Importantly, they were interested in the neighborhood-level contextual effect for all youth, extending beyond just benefits for those who utilize these service providers directly. Like my results, Zimmerman did not find a significant direct association between aggregate disadvantage and self-reported violence, or the number of youth organizations and violence. Instead, the relationship between low levels of self-control and risk for violence was attenuated by higher counts of youth organizations. Further, this effect was mediated by levels of what the authors called “child-centric social control,” or collective efficacy about how likely their neighborhoods would be to intervene to correct youth behaviors such as truancy and graffiti.

Notably, the youth organization index used in Zimmerman et al.'s study was based on resident perceptions of available resources, rather than counts of existing organizations and for a larger bounded area of approximately 8,000 residents which is a limitation the author notes. Nevertheless, the Zimmerman and colleagues' article is important because it highlights the complexity of the relationship between neighborhood context and youth violence using over time data. My chapter extends and supports this work by utilizing a smaller unit to assess neighborhood using walkable buffers of the youth's immediate residential surroundings.

A second article, by Intravia et al. (2017), found that prosocial attachment and involvement mediated the relationship between community disadvantage and recidivism for a large sample of offenders in Florida. They observed that community disadvantage increased the risk of recidivism directly and indirectly by reducing prosocial bonds. Youth in more disadvantaged communities were more likely be charged with a new offense within one year of release. However, this effect was partially mediated by prosocial attachment, measured using youth self-reports of closeness to family and non-family adults, and prosocial involvement, measured using youth reports of interest and participation in extracurricular events. Living in disadvantaged zip codes reduced the prosocial bonds of youthful offenders, which explains in part why disadvantage was influential in increasing repeat offending risk.

Together, these articles offer promising evidence that contextual elements that increase or decrease the formation of social bonds in a neighborhood are influential in youth offending behavior. My contribution is that the influence can be observed simply by accounting for their physical presence in the community as a contextual measure,

which is a more conservative measure than involvement measured by Intravia et al. (2017). The presence of community institutions providing prosocial opportunities for the neighborhood reduced recidivism risks for violent/drug offenses which supports the logic Zimmerman and colleagues (2017) articulated that these types of institutions generate social control over behavior that extends beyond direct engagement. To this point, Grunwald et al.'s (2010) neighborhood-level measure of social capital indicated a reduction of drug recidivism risk for juveniles living where trust and solidarity between residents was high.

It is important, however, to take a cautious approach to these findings, given other mixed evidence at a larger scale. Wo (2016) found no association between the number of voluntary organizations and violent or property crime across nine U.S. cities suggesting a cautious interpretation of the power of voluntary associations and other "prosocial" entities to influence crime in the aggregate. However, the results of this study in concert with previous scholarship suggest agencies or programs that increase collective levels of social control, such as through the presence of a neighborhood YMCA or public library, may offer community benefits beyond direct service use, as evidenced by reduced recidivism for drug/violent offending.

I did not find evidence that police/detention center proximity reduced repeat offending, as predicted. In contrast, the presence of detention/police facility within walking distance nearly doubled their risk of a new violent/drug complaint for youthful offenders who completed diversion. This stands in contrast to previous work in Spain that found fewer drug-related police interventions in areas nearest to the police stations (Marco et al. 2017). One argument is that rather than providing a deterrent effect as a

watchful eye on the neighborhood, detention/police facilities are enhanced surveillance entities. Spatial proximity to these establishments may make it more likely and convenient for police to catch offenders nearby, rather than apprehending all offenders. In Chapter 4, I observed a positive association between population density, disadvantage, and the density of police/detention establishments. However, results from national data from 2007 show that young adults from higher socioeconomic backgrounds were more prone to use alcohol, marijuana and tobacco (Patrick et al. 2012), rather than more impoverished households. Another reason for my results may be due to my recidivism measure, which is based on a formal complaint from law enforcement, rather than a self-report of delinquent behavior, so I am unable to address whether this is a function of increased exposure to policing agents or if police/detention center proximity is indicative of a high crime/high needs area which manifests itself in higher recidivism risks for low-level juveniles. Future research should explore this relationship further using self-report data on delinquent behavior and over-time data on police/detention center locations.

Religious congregations and ministry organizations had no effect in any recidivism models. This finding is not surprising given that prior scholarship has been mixed in relation to church distribution and crime. Research has observed a null effect (Houser et al. 2018; Willits et al. 2011), a positive relationship between neighborhood church counts and property crime (Desmond et al. 2010) and street crime and assault (Triplett et al. 2012), and variation by type of tradition (Beyerlein and Hipp 2005). A far greater number of studies has examined individual religious behavior or salience as an individual protective factor preventing crime initiation or as factors increasing likelihood of desistance. Religious adherence has long been theorized as an element in generating

social bonds that deter youth from delinquent activity and a large body of research has supporting the idea that religiosity moderately reduces anti-social behavior and violence (see meta-analysis by Baier and Wright 2001; Salas-Wright, Vaughn and Maynard 2013). When examining religious adherence among individuals, Harris et al. (2015) found that adherence to evangelical Protestant religious tradition is associated with lower violent crime among youth, but not adults. Another study found that more frequent church attendance reduced drug use and other illegal activities among young, black male teens living in disadvantaged areas of Boston, Chicago, and Philadelphia, suggesting that active engagement with a congregation may provide social control insulating inner-city youth from risk (Johnson et al. 2000). Thus, it may be that individual engagement with religious congregations or profession of faith adherence are better measures of social control by way of church establishments than the spatial proximity measure used in this study. Future research could consider these alternate measures to assess the relationship between religious involvement or attachment, in addition to proximity.

Although the social service needs of juvenile justice involved youth are well documented, I did not observe any significant associations between proximity to these establishments and youthful reoffending. Hipp et al. (2010) observed a reduction in recidivism risk for adult parolees in California with social services nearby, but I did not find comparable effects for juvenile offenders in the Phoenix urbanized area. The measure of social services agencies was marginally significant and in opposite directions depending upon the juvenile population and type of recidivism modeled. One reason I did not observe strong findings for this measure may be due to the heterogeneity of these establishments in my dataset serving a range of populations (e.g., veterans, senior

citizens, youth/families) rather than those that specifically serve and target juvenile populations. For example, Slocum et al. (2013) did not observe any relationship between crime and voluntary organizations as an aggregate category. However, organizations that linked local community members with policy and advocacy work beyond the neighborhood were associated with less violent crime. Houser et al. (2018) found similarly mixed organization results in their study of recidivism for adult offenders in Philadelphia. They observed no relationship between spatial proximity to religious congregations and substance abuse treatment facilities, despite the prediction that these entities would reduce recidivism by providing services and community integration necessary for parolees. Subsequent work could examine whether a relationship between juvenile repeat delinquency and social service agencies that specifically target youth and families with children.

Property Offending: Opportunity-Driven

The most intriguing finding from this chapter were observed in the models of property reoffending since these models were markedly different than models of other types of recidivism risk, both in terms of the individual and community context predictors. For diversion youth, boys, other non-Hispanic minorities and youth with any prior were more likely to recidivate for a property charge. Any prior offense made these youthful offenders over four times as likely to recidivate for a property offense (HR=4.250), and in the days early after release from supervision as indicated by a time-varying interaction. Neighborhood disadvantage was positively associated with risk before adding organization measures, however, this effect did not hold in the models accounting for organizations. What is noteworthy is that the total number of

organizations (Table 6-7) within a 15-minute walkable area, rather than specific subgroup types, were positively associated with property recidivism (HR=1.092 in Table 6-7). This provides support for the place-based theory of crime, which predicts non-residential zoned areas are places that enhance the opportunity for crime (Brantingham and Brantingham 1995). More specifically for property crimes, which include such offenses as theft, shoplifting, and graffiti, the logic is that commercial areas with a high number of establishments may be a better measure of opportunity than specific types of entities. Given this, retail spaces, such as large shopping centers, foster opportunities for delinquency via unstructured time where teens are just 'hanging out' (Osgood and Anderson 2004) as well as the goods for shoplifting. This study does not examine retail entities specifically, but certainly indicates that places with more organizations (e.g., religious, civic/membership/voluntary, social service, library/center) enhance the opportunities for property offending net of individual predictors. Future research could closely examine the relative contributions of retail space proximity to juvenile reoffending behavior.

For probation offenders, property offending was the only recidivism type modeled where prior offense history measures of total number of priors and prior property offense were not significant. Instead, I found that juveniles who had ever spent at least 24-hours in juvenile detention were more likely to repeat property offend within one year of release. Neighborhood disadvantage amplified risk before considering organizations but the effect was reduced to marginal significance after accounting for organization. Unlike the findings for diversion youth, the total number of nearby organizations was not a significant predictor of recidivism. One organization measure, for the number of social

services nearby, was negatively associated with property recidivism, but marginally so (HR=.927, p<.10). The interpretation offered previously for diversion, that total number of nearby organizations increases property crime opportunities, does not appear to hold for probation offenders.

One explanation could be related to the experience of juvenile detention. Differential association theory would predict that youth who are detained with other youth in juvenile detention see an increase in both the know-how and motivation for property offenses. While there is some evidence that juvenile detention can increase recidivism compared to other consequences (Ryan, Abrams, and Huang 2014; Wilson and Hoge 2013), others have found the effect limited to male offenders released from high-risk facilities (Winokur et al. 2008). But this argument does not explain why juvenile detention time matters for property recidivism only.

Another argument could be that property offending is a distinct type of offending. Ranking offense types on a continuum ranging from minor status/public peace offenses (e.g., the petty stuff of adolescence, speeding, running away, loitering) to more serious violent/drug offenses such as those with obvious victim (e.g., aggravated assault) or specialized (e.g., drug paraphernalia, possession or sale). Property offending would lie somewhere in the middle of the continuum. One possible explanation is that the experience of being detained served as a catalyst for 1) exposure to delinquent peers that increases risk and/or 2) an experience consistent with labeling theory that reduces the social bond of respect for authority which transcends into the community (e.g., shoplifting, graffiti). My data do not allow me to elaborate further, but this finding does

provoke curiosity and suggest more research is needed that disaggregates the new type of offense risk as I have done here.

One main takeaway from this chapter is that aggregate neighborhood disadvantage is not a strong neighborhood indicator of repeat offending for juveniles in the greater Phoenix metropolitan area. Disadvantage was not significantly associated with any type of repeat offending for reentering youth, after accounting for community organizations which challenges the predictions of social disorganization theory. Furthermore, as the tract-level analyses earlier showed, disadvantaged neighborhoods were not depleted of resources, but rather had more organizations per capita than more affluent areas which challenges the image of poor neighborhoods as institutional deserts. The implication here is that, at least in the case of the Phoenix-urbanized area, the measurement of community context needs to be more nuanced than aggregate neighborhood disadvantage scores can provide.

On the whole, individual risk of juvenile recidivism was relatively unaffected by general measures of the neighborhood context, either disadvantage or organizations. The interesting results only emerged when further specificity was made. This seems to suggest that to understand neighborhood context on juvenile delinquency requires explicating both the type of offense and why these behaviors are sensitive to the local context, as well as the resources available to inhibit or motivate crime.

Limitations

Although this study advances the current state of knowledge on environmental influences of juvenile recidivism by using a unique dataset pinpointing the organizations most proximate to juvenile offenders' homes, there are important limitations to note.

First and foremost, it is important to acknowledge the limits of spatial proximity as a model of accessibility. Most scholars agree that spatial proximity is only one component of accessibility (see Guagliardo 2004). It is both the physical infrastructure of the neighborhood *and* the resources of residents that determine resource accessibility. For example, Abramson (2015) observed that seniors trying to replenish their Ensure supplement had widely varying degrees of difficulty depending upon their neighborhood (e.g., supermarket nearby) and personal resources (e.g., mobility, finances). Others have used the term 'spatial capital' to describe this notion of both resources and structure (Galaskiewicz et al. 2016; Galaskiewicz et al. 2014; Marcus 2010). While spatial access may facilitate utilization, it is not sufficient. For example, adding a supermarket into a 'food desert' altered resident perceptions but not lead to dietary changes in neighborhood residents which brings the limitations of spatial accessibility to the fore (Cummins, Flint, and Matthews 2014).

For youthful offenders, the presence of a YMCA down the street is not directly beneficial if one cannot pay for the membership to use it or feels ostracized as a 'delinquent.' I have not assumed that juvenile offenders will utilize these services, but that they and their neighbors reasonably could and that this coming together of the general community provides collective benefits that can be observed at the individual-level. Certainly, individual agency is an important determinant of repeat offending (Laub and Sampson 2003). Structural constraints may restrict the range of options and scenarios available to individuals, however offenders are often actively engaged in selecting from the available options to persist or desist from crime. This current study offers a window into the spatial relationship of juvenile offenders and the community

organizations in their localized neighborhood which is a fruitful starting point, however, additional research should seek to understand the complexities of how reentering youthful offenders and their families use their neighborhood resources. Understanding actual utilization could improve our understanding of spatial proximity as an element of spatial capital, particularly for those with limited mobility around the metropolis.

Another limitation arises from the data. I did not observe strong effects for the organization subgroups across all types of new offenses. For example, although social services are theorized to reduce repeat recidivism by offering services that buffer the deleterious effects of disadvantaged neighborhoods and/or provide resources needed for struggling youth and families, I did not observe a consistent relationship with recidivism in my analyses. This may be due to the heterogeneity of these establishments in my dataset including organizations that served many populations (e.g., veterans, senior citizens, youth/families) rather than those that specifically serve and target juvenile populations.

There is emerging evidence that more specificity is required to observe organizational influences on neighborhood residents. In this study, I conceptualized organizations as sources of social or formal control as informed by theories of juvenile delinquency. My findings, however, were not robust for any specific category or type. An alternate approach, which Slocum et al. (2013) suggests, is to differentiate organizations not only by the type of services provided, but rather the extent to which the organization bridges beyond the local community. The authors did not observe any relationship between crime and voluntary organizations as an aggregate category. However, they found that organizations that linked local community members with

policy and advocacy work beyond the neighborhood were associated with less violent crime. Similarly, Marwell (2007) observed that community organizations that drew in external resources to the neighborhood were most influential in serving Brooklyn neighborhoods. Beyerlein and Hipp (2005) found that counties with more mainline Protestant and Catholic churches, which they conceived of as bridging entities, saw lower crime crates, whereas counties with evangelical Protestant, viewed as inward-looking, had higher crime rates. Subsequent work could examine the relative influence of bridging establishments versus bonding organizations in relation to juvenile repeat delinquency as an alternate dimension for organization influence which would perhaps improve the robustness of the findings.

Organizations are Elusive but Not Inconsequential

In conclusion, results from this chapter suggest that the link between organizations and juvenile reoffending is elusive, but not inconsequential. I found evidence that the neighborhood influence on individual juvenile offender behavior cannot be solely understood by aggregate disadvantage nor by individual characteristics alone. Indeed, aggregate levels of neighborhood disadvantage was not a strong predictor of repeat offending risk. Instead, my results indicate that spatial proximity to organizations is an important component of neighborhoods that also exert influence on individual behavior, though the effect is variable by type of organization, offense behavior, and juvenile offender population. My results are modest but do lend support the finding from other recent work which suggests organizations must be examined by type for specific types of outcome (Houser et al. 2018; Slocum et al. 2013). As the first study to examine juvenile repeat offending by type of new offense using geographic proximity to

organizations, my findings provide a provocative first step for future scholars interested in understanding which types of behaviors are sensitive to the organizational infrastructure of a community. More research is needed to assess the causal relationship between organization and juvenile offender behavior since my study is limited by cross-sectional data. Organizations are not a panacea; rather different offender populations and delinquent acts are sensitive to different aspects of the local institutional environment (Sharkey and Faber 2014; Stansfield 2016). My research indicates that measures of organizational infrastructure are worth exploring further as meaningful reflections of the local environment, providing more nuance to our understanding of ecological contributions to delinquency than socioeconomic indicators alone.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

Nearly a decade ago, McQuarrie and Marwell (2009) argued more attention should be paid to the role of organizations in structuring life opportunities for urban residents as they contribute to "urban social relations, neighborhood conditions, and individual outcomes and identities" (p. 247). A vast literature records an association between residential neighborhood and inequality (Allard and Small 2013). However, there is still much to be learned about the mechanisms and processes that explain neighborhood effects. Urban scholars have called for additional research on how, why, for whom, and for what specific outcomes neighborhood context matters (Sharkey and Faber 2014). In addressing the organizational component of neighborhoods, two key questions drive the literature and were examined in this dissertation. Where are valued organizations located and is there evidence of spatial inequality based on socioeconomic and demographic characteristics across the urban landscape? If so, does the unequal distribution of neighborhood organizations influence individuals?

This dissertation sought to address these gaps in the literature using spatial data on juvenile offenders, community organizations, and neighborhood disadvantage in the greater Phoenix-metropolitan area. Specifically, I examined whether spatial proximity to organizations theorized to increase or reduce *social or formal control* influenced the individual risk of repeat offending for reentering juvenile offenders, controlling for individual characteristic and aggregate neighborhood disadvantage. My findings are relevant for juvenile justice practitioners and policy-makers seeking to reduce repeat delinquency, as well as academic scholarship on the role of neighborhood organizations in urban inequality more generally. In the sections that follow, I provide a brief overview

of the theories and literatures that informed this manuscript, my methodology, key findings, limitations, and implications of this work for policy and future research.

The Current Study in Context

Urban sociology has long emphasized that residential neighborhoods matter because they reduce or enhance exposure to risk and opportunities that determine quality of life in the city (Leventhal and Brooks-Gunn 2000; Sampson et al. 2002). Some of the earliest scholarship on neighborhood context focused on crime and delinquency (Park and Burgess 1925). Shaw and McKay's (1942) theory of social disorganization predicted that neighborhoods with significant economic disadvantage, ethnic heterogeneity, and residential mobility would have higher juvenile crime rates because they had fewer institutional and social resources to keep youth in check. Social disorganization theory was later abandoned in favor of models using individual and family characteristics to predict juvenile delinquency (Cottle et al. 2001), though that has been a renewed interest in reexamining the neighborhoods of adult offenders released for prison (Kubrin and Stewart 2006; Mears et al. 2008).

The notion that spatial access to organizations impacts the quality of life for urban resident resonates is not a new idea (Sánchez-Jankowski 1991; 2008; Wilson 1987; 1996). However, until recently most quantitative neighborhood effects research relied on compositional measures of environmental context (e.g., percent in poverty, percent Black) rather than specifically examining organizations in urban neighborhoods (Clifford 2018: 1541). This is surprising given the call by numerous scholars to examine formal organizations as an important "missing link" in explaining why residential context matters (McQuarrie and Marwell 2009; Marwell and Gullickson 2013).

There are two competing perspectives that frame the existing research on organizations and neighborhood disadvantage (Wo 2018). A classic neighborhood de-institutionalization framework predicts that socioeconomic disadvantage will be associated with fewer organizations per capita which emanates from Wilson's (1987; 1996) work on concentrated poverty in predominantly black, inner-city communities in Chicago. More recently others have argued that de-institutionalization does not characterize all poor neighborhoods (Small and McDermott 2006). A neighborhood revitalization perspective expects that some types of valued organizations, such as poverty-relief nonprofits, will be located where they are needed most. Mixed findings suggest that the relationship between disadvantage and organizational densities may be context-specific and different for various types of organizations (Clifford 2018; Peck 2008; Marwell and Gullickson 2013; Small and McDermott 2006; Yan et al. 2014).

The concern with an inequitable distribution of organizations is that differential access may translate into unequal exposure to crime. Some facilities, such as alcohol establishments, subway stations, and public parks (Groff and Lockwood 2014; Groff and McCord 2012) are associated with more crime. Other establishments, such as nonprofit and voluntary organizations, may reduce crime but the scholarship on protective effects of organizations has been mixed (Peterson et al. 2000; Sharkey et al. 2017; Slocum et al. 2013; Wo 2016). Some research has found that living in poor areas (Kubrin and Stewart 2006; Mears et al.2008) or in areas with taxed social services agencies (Hipp et al. 2010) increased recidivism risk of reentering adult offenders, but other scholars have not found a strong environmental influence (Tillyer and Vose 2011; Wang et al. 2014).

Federal funding priorities over the last few decades have emphasized community-based interventions to reduce crime and delinquency (Abrams and Snyder 2010). For example, the Federal Weed and Seed program launched in 1991 provided grants to "weed" high drug and violent-crime neighborhoods of offenders using targeted law enforcement interventions and community policing, and then "seed" the neighborhood through revitalization efforts (Lilley 2014). The Second Chance Act, passed by Congress in April 2008, authorized significant federal funding to support nearly 600 grants in 49 states from 2009-2014 to reduce recidivism by providing services to aid in successful reentry (Council of State Governments Justice Center). However, only a few studies have looked at where service organizations are in relation to the targeted juvenile populations (Lockwood 2012; Lockwood and Harris 2015), leaving a gap between policies and our understanding of community infrastructure and crime.

There is good reason to expect that reentering juvenile offenders would be sensitive to the institutional composition of their neighborhood. In addition to providing youth with valued services after court-completion such as substance abuse treatment or family counseling, community organizations may also influence the friends they make, the activities they participate in, and levels of adult supervision over their day to day lives. Routine activities, differential association, and social control theories of juvenile delinquency emphasize the internal and external constraints that prevent youth from engaging in delinquent activities (Burgess and Akers 1966; Cohen and Felson 1979; Hirschi 1969; Sutherland 1947). The idea is that community organizations, such as the libraries/community centers and recreation centers, can enhance conventional activities or reducing the time spent unsupervised or with delinquent peers. Alternatively, other

facilities such as public parks may increase the time that adolescents spend in mixed company without adequate supervision.

Despite the theoretical connections between neighborhood organizations and youth delinquency, this dissertation was the first empirical work to specifically examine spatial proximity to community organizations and repeat offending risk for juvenile offenders. Until recently, juvenile recidivism scholarship has almost exclusively focused on individual and family conditions that predict repeat offending (Cottle et al. 2001). However, with advancements in spatial analysis and data collection, a number of recent studies on neighborhood contributors to juvenile recidivism have been published (Grunwald et al. 2010; Harris et al. 2011; Intravia et al. 2017; Mennis et al. 2011; Wright et al. 2014) making this study timely and relevant.

Empirical Approach and Main Findings

This dissertation was concerned with two primary objectives. My first task was to assess whether there was spatial inequality in the distribution of resources (socioeconomic disadvantage and organizations) relative to the juvenile offender population in the Phoenix-metropolitan (Chapter 4). The second task was to consider whether spatial proximity to organizations influenced recidivism, net of neighborhood disadvantage and individual characteristics (Chapters 5 and 6). To accomplish these goals, I used a unique geolocated dataset with point-level data on seven types of community organizations, point-level data on the approximate residential addresses of juvenile offenders ending juvenile justice supervision in Maricopa County in 2007, and tract-level data from the U.S. Census American Community Survey.

In Chapter 4, I examined the spatial dynamics of the study area using maps and spatially weighted regression models with census tracts as my unit of analysis. Since Chapter 4 was exploratory and descriptive, I did not offer a formal hypothesis, but I did expect that more disadvantaged communities would likely have fewer organizations per capita. I found that there were more organizations per capita in more disadvantaged neighborhoods, rather than fewer as expected. Reentering juvenile offenders from diversion and from probation were, however, located in tracts with greater socioeconomic disadvantage, a higher percentage of Latino residents, and fewer organizations theorized to reduce risk.

At first these two sets of finding appeared to contradict one another, and the former was clearly at odds with my expectations. However, maps of the offender and organization distributions indicated that many reentering juvenile offenders were returning to suburban communities on the south, west and northern periphery where the organizational infrastructure was less developed than the urban core. These tracts were neither the most impoverished nor the most affluent, but had both a large population of youthful offenders and a comparably less developed infrastructure of important community-building institutions such as civic/voluntary/membership, religious, and social service agencies. The suburbanization of poverty literature has documented the precipitous rise of poor and near-poor families in suburban areas, as well as insufficient nonprofit and government resources to adequately address the rising needs (Allard 2017). While I cannot assess the socioeconomic situation of the youth and their families, there were many disadvantaged people living in their neighborhoods. Additionally, the maps of the metropolitan area indicated there was a spatial mismatch between the density of

offenders poised to reintegrate into their communities, and the types of institutions poised to exercise social and formal control of offender behavior.

In Chapters 5 and 6, I explored how these dynamics operated at the individual unit of analysis. I offered two conceptual models for the hypothesized influence of neighborhood disadvantage and community organizations on individual recidivism (Figures 2-2 and 2-3). The argument is that youth in socioeconomically disadvantaged communities face higher risks of recidivism in part because they have fewer organizational resources generating the ties that bind and/or the presence of watchful guardians to inhibit repeat delinquency. In Chapter 5, I examined the contributions of a neighborhood disadvantage score on an individual's risk of any recidivism, status/public peace, property, and violent/drug offending, controlling for offender characteristics. I predicted in Hypothesis 1 that neighborhood disadvantage would be positively associated with the risk of recidivism as a social disorganization perspective would expect. I ran separate models for two groups of offenders, those who had completed a diversion program and those who had completed probation supervision and consequences, to observe any differences in the influence of neighborhood disadvantage based on supervision tract.

Surprisingly, results from Chapter 5 did not indicate a uniform amplification of risk for those youth residing in more disadvantaged neighborhoods as predicted in Hypothesis 1. Only property offending risk was higher for kids living in neighborhoods with fewer socioeconomic resources. Disadvantage was unrelated to other types of offending. My result for property offending supports the notion that environment can influence some types of delinquent activities, though the mechanisms through which this

influence occurs are unanswerable with solely an aggregate neighborhood disadvantage score to measure of environmental context.

In contrast, individual-level predictors of recidivism, gender and offense history, were the strongest, consistent predictors of recidivism risk. For probation offenders, a prior status/peace offense or prior violent/drug offense increased the likelihood that youth would repeat offend for complaints in these categories. Like other research I also found that males were more likely to reoffend than females (Cottle et al. 2001), except for status/public peace recidivism among probation youth. In addition, I observed time-varying relationships between some individual-level control variables and the risk of repeat offending which indicates that there is a temporal aspect to recidivism risk. For example, diversion tract offenders who had a prior offense were over three times as likely to offend than those without any prior offenses (Table 5-5). Moreover, offenders with a prior complaint faced the highest risk to offend early after their completion of consequences because a time-varying interaction indicated a reduction in risk over time. Together, these findings reflect the promise of examining both space and time to understand how community context influences individuals (Kwan 2013).

In Chapter 6, I examined whether the number and type of organizations located within walking distance of juvenile offenders' residence influenced their likelihood of repeat offending, controlling for individual-level characteristics and neighborhood disadvantage. I used buffer-analysis to bound the local context to an area within 15 minutes walking distance of the juvenile offenders' approximate residential address. I predicted that more *risk reduction* organizations nearby would reduce a juvenile's recidivism risk (Hypothesis 2) while more *risk enhancing* organizations nearby would

increase the likelihood of repeat offenses (Hypothesis 3), controlling for individual characteristics.

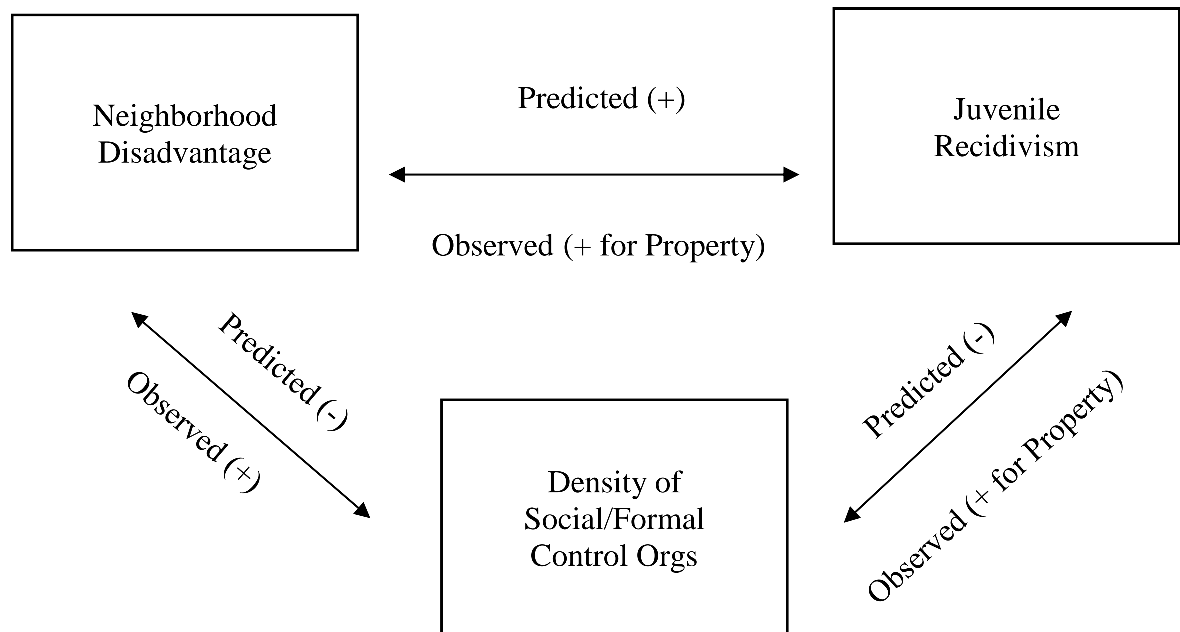
My results were mixed. First, the neighborhood disadvantage score that was predictive of property offending became statistically insignificant after accounting for organizations. The total number of organizations *increased* recidivism for property offending, but overall disadvantage was not a significant predictor. This was surprising because organizational density should have been negatively associated with recidivism. From the tract-level analysis, I observed that in the greater Phoenix metropolitan area before the Great Recession, the density of all organizations was positively associated with disadvantage[41]. This also was surprising because densities were thought to be higher in more advantaged communities[42].

Figure 7-1 shows the predicted and observed relationships between disadvantage, organizations and juvenile recidivism. Although I expected to find fewer organizations per capita in areas of greater socioeconomic disadvantage consistent with a de-institutionalization perspective, I observed in Chapter 4 that neighborhood disadvantage at the tract-level, was positively associated with the density of organizations. Although, maps of the area showed that there were tracts within the study area with high disadvantage, fewer organizations per capita, and a high density of juvenile offenders, this was not the prevalent pattern. Percent Hispanic, however, was associated with fewer

[41] I found a positive association for all organizations combined (Table 4-4) and for five of the seven subgroups (Table 4-5). When modeling specific organization subgroups, there was not a significant association between disadvantage and schools or libraries/community centers.
[42] The effects of the recession on the infrastructure of these particular communities would be interesting to study as a follow-up to these analyses, but this question is broader than the focus of this study.

risk reducing organizations per capita and a higher density of reentering juveniles as a proportion of the population.

Figure 7-1. Predicted and Observed Model of Disadvantage, Organizations, and Recidivism



In contrast to my expectations, neighborhood disadvantage was not significantly associated with an enhanced risk of juvenile recidivism for all types of recidivism. Rather, the effect was limited to property recidivism only as noted in Chapter 5. However, the addition of organization measures into the models in Chapter 6 reduced the influence of neighborhood disadvantage to non-significance. Rather than inhibiting recidivism, youthful offenders from diversion with more total organizations nearby had a

higher risk of property recidivism compared to youth with less organizational rich residential neighborhoods.

However, within subcategories of organizations, I did find some intriguing results when modeling the relationship between organization subtypes and specific new offenses. In Hypothesis 2, I predicted that proximity to risk reducing organizations would reduce recidivism risk. I observed that violent/drug recidivism risk was lower for diversion youth living near a library/community center which supported Hypothesis 2, but violent/drug recidivism for diversion offenders was significantly heightened with the presence of a detention/police facility which was contrary to my predictions since these facilities were theorized to exert a deterrent effect. In support of Hypothesis 2, violent/drug recidivism was lower for probation youth living near civic/membership/voluntary establishments nearby.

Parks and middle/high schools were predicted to enhance risk of repeat offending as predicted in Hypothesis 3. I observed that a nearby park increased status/peace recidivism for diversion youth which supported my prediction. However, the presence of a middle/high school in the neighborhood reduced status/peace recidivism for probation youth which ran contrary to Hypothesis 3. Thus, the hypothesized relationship between organizations and juvenile offending was associated with recidivism risk in a limited number of circumstances, however I cannot say that the theory was supported in general.

Discussion

There is no neat and tidy explanation for these results. As with many social scientific endeavors, my mixed and unexpected findings offer an opportunity to revisit the conceptual models and theoretical assumptions in the literature on urban

environments. My first intention with this manuscript was to establish whether there was spatial inequality across the Phoenix metropolitan area which could influence the lives of residents with less spatial access to community organizations. I did observe that tract demographic characteristics were associated with the distribution of resources, but not entirely in the expected direction. The first unexpected finding was that socioeconomic disadvantage was positively associated with organization densities.

Others have suggested the relationship between disadvantage and organizational densities is be more complicated than previous thought, likely varying by metropolitan context and/or the type of organizations modeled. Evidence from Los Angeles shows a u-shaped curvilinear relationship with high nonprofit densities in both disadvantaged and affluent tracts (Wo 2006). Other research in Phoenix (Peck 2008) and Hartford, Connecticut (Yan, Guo, and Paarlberg 2014) reported there were more anti-poverty nonprofits in areas of greater economic need. Still other research has found variation by organization type. In New York City, Marwell and Gullicson (2013) noted that smaller, localized nonprofits were in disadvantaged areas but larger distributive organizations that allocated funding were in predominately affluent neighborhoods suggesting variation by subgroup.

The focus of this dissertation was not on the causes of the unequal distribution of resources, but rather on the effects of this inequality for individuals. However, my finding that disadvantage was positively associated with the density of organizations speaks to a literature on this topic. Small and McDermott's (2006) critique of de-institutionalization theory, suggests that race, rather than socioeconomic status is the key determinant of organizational densities. In a study of 331 U.S. metropolitan areas, the

authors found that poverty and the proportion of foreign-born immigrants were positively associated with retail establishments, such as hardware stores, banks, childcare centers, and restaurants. Poor neighborhoods in the South and West had more organizations than other regions of the U.S., which aligns with my findings in this study. Small and McDermott's (2006) main observation was that the proportion of black was negatively associated with the number of organizations. I did not observe any significant association between percent black and organizations, but this is not surprising given the relatively small black population in the Phoenix metropolitan area. However, I did find that tracts with a high proportion of Latino and Native American residents had fewer *risk reducing* organizations per capita. Further, tracts with more Latino residents also had a higher density of reentering juvenile offenders.

It may be that percent Hispanic is a more meaningful predictor of the distribution of resources in the Phoenix metropolitan area than socioeconomic disadvantage or percent black[43]. This has been observed in related work on recreation, food, and health care organizations in the same area (Anderson 2016; Galaskiewicz et al. 2016), but for some and not all types of facilities. Although my focus here is to understand the implications of organizations for individuals, rather than explain what predicts the inequitable distribution of resources, future scholarship should be sensitive to the racial and socioeconomic factors that shape community context for juvenile offenders.

[43] A full discussion of urban racial/ethnic segregation and the resulting impact on residents is far beyond the scope of this dissertation. My goals in Chapters 5 and 6 were to examine the organizations and disadvantage specifically and I was limited in the community-context predictors I could add to the individual models while still accounting for relevant individual characteristics. However, after completing the full manuscript I reexamined the buffer analyses including percent Latino. Findings from these robustness tests did not produce any meaningful findings or change the substantive interpretation of organizations, disadvantage, and juvenile recidivism risk.

At the individual level, I did not find strong support for a uniform influence of *risk enhancers* or *risk reducers* in the aggregate as predicted. One possible explanation for these limited findings may be due to the heterogeneity of the establishments in these categories when pooled together. Within some subcategories, there was also a wide range of organization types as discussed thoroughly in Chapter 2. For example, the social services category included a range of establishments that served not only juvenile populations, but services for adults, veterans, and families which may have prevented me from observing effects for organizations targeted at adolescents specifically. While other categories, such as libraries and community centers, were more homogeneous, I did not have information on the breadth of programs offered within establishments or the quality of those services which may have contributed to my limited findings.

Another explanation is that my typology for community organizations and their theorized influence should be revised. I derived my predictions based on *formal and social control* since this is a dominant theme in the crime and delinquency literatures. The most obvious revision would be to reconceptualize the influence of police/detention centers as surveillance entities that make it easier to formally apprehend youth offenders, rather than serving as visible deterrents. Living near to a police or juvenile detention facility was positively associated with repeat offending for violent/drug offenses for previously low-level offenders. As self-report and victimization studies indicate, reliance on formal new complaints for recidivism underestimates the extent of repeat delinquency among offenders who are not apprehended (Bartollas and Schmalleger 2014). Given this, my finding should be interpreted cautiously.

Another way to reconceptualize the influence of organization is to consider whether the establishment is a "bridging" organization that reaches beyond the local neighborhood or a "bonding" organization that brings residents together but may be exclusionary to non-members. Prior studies of religious congregations and voluntary organizations have used this distinction. Beyerlein and Hipp (2005) found that counties in the U.S. with more bridging congregations (mainline Protestants and Catholics) saw lower crime rates, whereas those with inward-looking bonding congregations (evangelical Protestant) had higher crime rates. In the Bronx, Slocum et al. (2013) did not find that all voluntary organizations reduced crime. Instead, areas with more political or advocacy organizations that "bridged" beyond the local community experienced less violent crime.

Alternatively, a third option is to step back from the particulars of each entity and consider how non-residential spaces of any kind bring together people and property to be victimized. By combining all community organizations in this study together in this way, I found that diversion youth living near more overall establishments had a greater risk of property recidivism. This argument, that establishments bring together motivated offenders and victims with a lack of supervision, could be tested using a broader range of organizations including retail establishments and large shopping centers (Brantingham and Brantingham 1995). Moreover, advances in spatially encoded data make it possible to examine traffic flows in time and space across the entire urban area which could be examined in future research.

Limitations and Extensions

Data Limitations

This dissertation has important data limitations that must be noted. I was unable to obtain reliable data on the juvenile offenders' family. It is well established that many court-involved adolescents have adverse childhood experiences (ACES) such as family violence, family separation, foster care involvement, abuse/neglect, or family mental illness (Baglivio and Epps 2015) and that these experiences increase the likelihood of repeat offending (Baglivio et al. 2016; Fox et al. 2015; Cottle et al. 2001). Parent criminal history, family composition, parental involvement, supervision of activities and family poverty have also been associated with juvenile delinquent behaviors (Craig 2016; Chung and Steinberg 2006; Grunwald et al. 2010; Maimon and Browning 2010; Osgood et al. 1996; Osgood and Anderson 2004; Sogar 2017; Walters 2015). Yet, many children who grow up in poor families and poor neighborhoods do not become chronic offenders. Family context can also insulate youth from community influences, as Burrington (2015) observed in immigrant families. Without data on the family, I was unable to assess these dynamics.

Another data limitation is that I could not get neighborhood-level crime information for the study year. Crime mapping technology has improved considerably over the last ten years, but standardized historical crime data were not available[44]. This omission is a drawback because crime may be associated with the relative distribution of organizational resources (Sharkey et al. 2017; Wo 2018) as well as activities of juveniles (Browning et al. 2017b). Future research on the relationship between neighborhood

[44] My study area covered multiple police jurisdictions. The only standardized data across all areas were Uniform Crime Report data aggregated to the jurisdiction level (e.g., City of Phoenix, City of Glendale) which were not compatible with my units of analysis at the census tract and buffer levels.

organizations and juvenile recidivism could benefit from geolocated crime data at a tract, block or point-level.

It is also important to note that use of cross-sectional data prevent me from making causal claims; my findings are associative. This also may be one reason my organizational findings were limited since my study year used data from just before the Great Recession. It may be that disadvantaged areas were flush with organizations during the boom years but were quickly depleted when the market fell. The fallout from the Great Recession was considerable and scholars are only beginning to understand fully the impacts for neighborhoods and residents. The *National Center for Charitable Statistics* reported a modest increase in the death rate of charities with $50,000 in revenue in the years following the recession (5%) compared to the 4.3% rate in the years preceding the recession (Brown et al. 2013). However, the spatial distribution of these dissolutions is less clear. Clifford (2018) found that poor communities had fewer charitable organizations than more affluent areas and lost them at a faster rate. Poor neighborhoods may face increased disadvantage when unfavorable market conditions strike.

Future research using longitudinal data could also shed light on the spatial relationship between residential development and community organizations. Residential development in Phoenix between 2002 and 2006 was particularly strong in the suburbs as agricultural land was converted to single family homes (Kane et al. 2014). There was also tremendous growth in residential areas adjacent to the urban core where minority and low-income residents were able to secure homes through sub-prime mortgages. These communities had more juvenile offenders and fewer organizational resources per

capita which may reflect the rapid pace of residential development which outpaced institutional growth (Maps 4-14 and 4-15). During the recession, these same areas suffered high rates of foreclosures (Immergluck 2010) but it is unclear how this may have impacted juvenile offenders. Over time data could show whether unstable housing and organizational demise potentially compounded the effects of the financial crisis for vulnerable families and communities.

Another potential criticism of this research is related to my choice of statistical models. There are diverging views on the best way to examine spatial data. The statistical software and analytical approaches continue to improve giving scholars more choices for analysis, though there are merits and drawbacks to each (Anselin 1988; Anselin et al. 1996; Anselin and Rey 2014; Xu 2014). I modeled my approach after Hipp et al. (2010) since my focus, like theirs, was to assess the influence of organizations located nearby on offender behavior. I favored Cox proportional hazard models because I wanted to capture days to recidivism as a continuous outcome, rather than a binary. I used robust standard errors to account for tract disadvantage scores, rather than using multilevel event history analysis. In comparing these approaches, Angeles and colleagues (2005) found they often resulted in comparable estimates. However, it is worthwhile to consider alternative statistical approaches to the ones conducted here to corroborate the robustness of my findings.

Limitations of Spatial Proximity Models

In this dissertation, I used spatial proximity as my measure of organization influence, however, spatial proximity to resources is only one dimension that characterize the interactions between residents and establishments. There are both spatial and a-

spatial components that characterize the potential for use and realized utilization of services (Guagliardo 2004). My work considers only the spatial dimension of potential utilization so additional research is needed that addresses these other dimensions.

Another way to improve upon the findings reported here is to use a buffer that better approximates where young people go throughout their daily lives. Kwan (2013) noted the various limitations of using geographic based measures of accessibility that ignore individual mobility and time constraints. She articulated a vision promoting scholarship that, for example, considers the ways in which the routine activities of the day lead individuals beyond their residential zip codes for work, school, and play, or considers the hours of operation as a cost for access, rather than simply being next door. There is growing interest in collecting real-time data using Global Positioning System (GPS) data to capture the actual routines of juvenile offenders (Browning and Soller 2014). Self-report data from teens in Philadelphia showed that much of their daily routines occurred outside their home census tract (Basta, Richmond, and Wiebe 2010). My use of a walkable buffer is a marked improvement over studies of organizational proximity-based counts in a census tract or zip code but is still limited as it approximates the potential for use, rather than actual utilization, and may not adequately capture where youth spend their time.

Finally, personal finances, mobility, and other status markers can be converted into a *spatial capital* that allows some people to capitalize on advantages in the urban environment even if they live in the same place (Marcus 2010; Galaskiewicz et al. 2016). For example, Abramson (2015) noted that inequality in old age comes from both structural aspects of the neighborhood (e.g., organizations, well maintained wheelchair

ramps) as well as the material resources of the individual (e.g., mobility, health insurance, social networks). For a senior in good health, having a grocery store nearby reduced the burden of obtaining nutritional supplements. However, living near a supermarket was relatively inconsequential for residents who could not easily leave their apartment or afford to buy the desired supplements (Abramson 2015: 42).

Individual resources may also have interactive effects that I was unable to observe here. Youth in more affluent families with access to reliable transportation may have access resources far beyond their immediate residential neighborhood with relative ease. Conversely, families with limited means may be geographically restricted and influenced more by what is nearby. Galaskiewicz et al. (2016) observed that the choice of nearby parks for children's activities was contingent on family resources. Children from all backgrounds were more likely to play at the park if there were more parks nearby, but families with fewer household cars were even more likely to use nearby parks for organized developmental activities than families with more cars. Status and privilege can also determine who feels welcome to utilize a space, as Center (2008) observed in San Francisco. The influx of wealthy dot-com workers re-appropriated neighborhood bars and restaurants as places for elite socializing which excluded long-time residents. Thus, the individual material and symbolic resources of juvenile offenders may also play a role in their engagement with (or lack thereof) nearby organizations.

Final Remarks

In many ways this dissertation raises more questions than it answers in line with Small and McDermott's observation that, "there is no single 'neighborhood effect,' positive or negative, only effects conditional on metropolitan context" (p. 1702: 2006).

Similarly, my findings indicate there is no singular *organizational impact* on juvenile recidivism, rather the influence of nearby community establishments is dependent upon the offender population, type of recidivism, and type of organizations examined. Delinquent acts, and the offenders who commit them, should not be divorced from the neighborhoods where they live, though community organizations are not a silver bullet to reduce repeat delinquency. Future scholarship should seek to identify additional community organizations that may impact other urban populations and outcomes.

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