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Neighborhoods and Crime: Collective Efficacy and Social Cohesion in Miami-Dade County

By

Craig D. Uchida

Marc L. Swatt

Shellie E. Solomon

Sean Varano

With the assistance of:
Christine Connor, Jonathan Mash, Corina Putt, W. Riley Waugh, and Robert Adams

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Justice & Security Strategies, Inc.
PO Box 6188
Silver Spring, MD 20916

Tel +1 (301) 438-3132
Fax +1 (877) 788-4235
Email cduchida@jssinc.org
Web www.jssinc.org

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CHAPTER I. INTRODUCTION

Research examining the linkage between neighborhood characteristics and crime rates has been an area of particular interest to criminology since the pioneering work of Shaw and McKay (1942) and other early social disorganization researchers. A lengthy body of literature has been devoted to understanding the role of neighborhood structural conditions, social functioning, and deleterious conditions including serious violent crime (Bursik & Grasmick, 1993; Messner & Tardiff, 1986; Sampson & Groves, 1989), gang membership (Hill, Howell, Hawkins, & Battin-Pearson, 1999), robbery, drug dealing, and assaults in micro-environments (St. Jean, 2007), school problems (Kirk, 2009; McCluskey, Patchin, & Bynum, 2004), and fear of crime (Wyant, 2008) among other social problems (see Sampson, 2012). From this body of research, it is clear that neighborhoods play critical roles in the lives of those that live, work, and socialize within their boundaries. For decades scholars have noted that communities differ in their capacity to create and enforce normative levels of pro-social behavior (see Kornhauser, 1978; Bursik, 1988; Warner, 2007). Networks of informal social control are central to establishing value systems that are reflective of prevailing social norms. Collective efficacy has emerged as a neighborhood-level concept whereby community members create a sense of agency (see Sampson, Raudenbush, & Earls, 1997) and assume ownership for the state of their local community. It is one of several forms of formal and informal social control that predicts the overall functioning of a community (Warner, 2007).

Defining Collective Efficacy and Social Cohesion

The concept of collective efficacy emerged out of the social disorganization literature and represents the capacity of residents, organizations, and other groups to exert social control and thereby reduce crime and violence. Sampson (2012) argues that collective efficacy includes

working trust among residents and the willingness to intervene to achieve social control. Although a neighborhood-level process, collective efficacy creates a conceptual linkage between shared social expectations, trust, and the aggregate physical and social characteristics of neighborhoods. Neighborhoods represent culturally significant spatial locations where culture is shared, social interaction occurs, governmental resources are allocated, and a sense of community is oftentimes seeded. Neighborhoods and the social structures contained therein can have some capacity to regulate human behavior through shared expectations that not only set boundaries of acceptable behavior, but also create cultural norms about what actions should be taken when standards are violated (Bursik & Grasmik, 1993).

According to Sampson (2004, p. 108), collective efficacy "captures the link between cohesion, especially working trust, and shared expectations for action." The social interactions between neighborhood residents, influenced in part by length of residence and similar cultural and/or ethnicity, holds the potential to create a strong sense of social cohesion and common interest (Sampson & Raudenbush, 1999; Warner, 2007). Social cohesion and trust, when high, ultimately help structure collective productive *action*, which ultimately functions as the cornerstone of collective efficacy.

From our perspective, within a neighborhood, the way in which people interact, share common goals and values, and trust one another are associated with levels of crime. Throughout this report, we focus on two major aspects of social functioning: collective efficacy and social cohesion. *We define collective efficacy as the collective ability of residents to produce social action to meet common goals and preserve shared values. We define social cohesion as an emotional and social investment in a neighborhood and sense of shared destiny among residents.*

When residents meet with each other and interact, they form social ties or acquaintanceships. In well-functioning neighborhoods, there will be a large number of social ties between residents; while in poorly functioning neighborhoods there will be a lot fewer of them. Obviously, some of these social ties will be more intense, leading to friendships. Kinship is another form of social ties between residents; often grandparents, cousins, uncles and aunts, and other relatives live in the same neighborhood. Ultimately, these social ties are the glue that helps bind neighborhood residents together.

These social ties represent a resource for the residents living in a neighborhood. Residents living in neighborhoods with close social ties tend to watch out for each other and their property. For example, they will make sure their kids are not getting into trouble, assist in shoveling snow off of sidewalks, monitor people hanging out in the neighborhood, and generally provide a sense of safety within the neighborhood. Collective efficacy therefore refers to the degree to which neighbors provide this sense of safety, and to intervene if something problematic happens. Intervening can include things like calling the police, asking questions of strangers, notifying parents if their children are misbehaving, forming community groups to address problems, or at a higher level, attending city council meetings to request assistance from government.

Social cohesion, on the other hand, refers to the emotional and social connection that comes with close social ties – it is the "sense of community" shared by residents of a neighborhood. In neighborhoods with high social cohesion, residents trust each other and experience a sense of belonging in the neighborhood. This sense of belonging comes from an increased emotional, social, and economic investment into the neighborhood – areas where

people own homes, send their kids to local schools, and "put down roots" tend to have higher social cohesion.

Research Questions

While substantial research on collective efficacy and the role it plays in protecting vulnerable communities against crime continues to accumulate (see Pratt & Cullen, 2005), there remain several important gaps in research in this area. For example, an important finding for this research was the clear distinction between collective efficacy and social cohesion. The size of the group domain for social cohesion suggested that this dimension is substantively different from collective efficacy and is important in understanding neighborhood social functioning. Thus, we focus on these two areas of social functioning.

The current project was jointly funded by the National Institute of Justice and The Children's Trust of Miami-Dade County to address some of these existing gaps in the understanding about collective efficacy. Specifically, the research presented in this report covers five main questions that remain largely unaddressed in the current research on collective efficacy and crime:

1. What are the psychometric properties of the most popular measure of perceptions of collective efficacy (the Sampson et al., 1997 scale)? Is this measure appropriate and well-constructed and is it being modeled correctly in extant research on collective efficacy?
2. At the level of individual perceptions, what are the important relationships between perceptions of collective efficacy and related constructs like social cohesion and other important perceptual outcomes, such as perceptions of incivilities, satisfaction with the police, and fear of crime?

3. Do the relationships between perceptions of collective efficacy, social cohesion, and related constructs and other key variables vary between neighborhoods? In other words, is there heterogeneity in the impact of perceptions of collective efficacy and social cohesion in different social contexts? If so, how does the impact of perceptions of collective efficacy and social cohesion vary and what are potential explanations for this heterogeneity?

4. What variables predict perceptions of collective efficacy, social cohesion, and related constructs? Do a person's activities within the neighborhood influence the degree to which they perceive it to function properly?

5. Is there local variability in collective efficacy, social cohesion, and other related constructs within neighborhoods? What strategies are available for modeling this variability?

This study is intended to serve as an assessment of these complex, unresolved issues in the understanding of collective efficacy and social cohesion. We used in-person community survey data collected from a sample of 1,227 respondents located across eight neighborhoods in Miami-Dade County, Florida. The study location represents an ethnically- and economically-diverse group of neighborhoods and survey respondents. The study design also included systematic social observations (SSOs) of street segments in each of the eight study neighborhoods (see Sampson & Raudenbush, 1999). In total, 235 street segments across the eight neighborhoods were coded, with an average of approximately 29 per neighborhood or approximately 20 percent of the total number of face block segments in each neighborhood.

The Need for a Psychometric Evaluation of the PHDCN Collective Efficacy Scale

The first research question examined in the current research is whether the current scale used to measure collective efficacy is well-constructed and demonstrates appropriate psychometric properties to recommend its future use. Currently the preferred strategy for assessing collective efficacy and social cohesion within neighborhoods is through the use of surveys of residents within neighborhoods. This strategy was employed in the Project on Human Development in Chicago Neighborhoods (PHDCN) study which used a hierarchical sampling strategy where residents were selected within neighborhoods (Sampson, 2012; Sampson et al., 1997). By combining elements of generalizability theory and item-response theory, Raudenbush and Sampson (1999a, 1999b) provide a conceptual strategy whereby individual responses to scales measuring collective efficacy can be treated as individual raters of collective efficacy within the community and then aggregated to the neighborhood level. The basic three-level hierarchical Item Response Theory (IRT) model links individual responses to particular items to the underlying construct of perceptions of collective efficacy to neighborhood-level aggregate measures. Their strategy provides a mechanism for adjusting for individual-level influences on perceptions of collective efficacy as well as providing a strategy for estimating the reliability of responses (Raudenbush & Sampson, 1999a, 1999b).

In terms of the measure of the construct of collective efficacy, by far the most commonly used measure comes from the PHDCN study. Sampson et al. (1997; Sampson, 2012) constructed a 10 item measure consisting of questions capturing information from two separate domains: perceptions of neighborhood social cohesion and perceptions of shared expectations for social control. A high correlation between domains and a large single factor structure led Sampson et al. (1997) to combine these items into a single dimension capturing collective efficacy. Sampson

(2012) discusses that replications of the PHDCN study have operationalized collective efficacy using similar measures in: Stockholm, Sweden; Los Angeles, California; Brisbane, Australia; England; Hungary; Moshi, Tanzania; Tiajin, China; Bogotá, Colombia; and other locations.

Given the popularity of the measure, there is an important need for evaluations of the quality of this measure. Raudenbush and Sampson's (1999a, 1999b) conceptualization of "ecometrics" shifts the emphasis toward understanding the quality of measures of the environment. However, psychometrics and ecometrics remain inextricably intertwined as measurement properties as the item and individual levels propagate across levels and intersect with estimates from the neighborhood level of the multilevel IRT model. For example, specification errors at level 1 (the item level) regarding the factor structure of collective efficacy may introduce biases in individual estimates of perceptions of collective efficacy at level 2 (the person level). This in turn can bias aggregate estimates of collective efficacy at level 3 (the neighborhood level). While Sampson et al., (1997; Raudenbush & Sampson, 1999a, 1999b) have contributed greatly towards the understanding of the individual level properties of the collective efficacy measure, there are some important questions that remain. It is common practice when designing a study to use measures that have been previously used in prior research. While this practice is laudable, there is a danger that scales that have not been sufficiently examined become re-used in a number of subsequent studies. In order to avoid this danger, it is necessary for thorough investigations into the quality of commonly used measures such as the Sampson et al. (1997) collective efficacy scale.

Sampson et al.(1997; Sampson, 2012) used a simple Rasch-based scale model for the individual items that need further scrutiny. We examine four aspects of the model. First, the unidimensionality assumption common to many IRT models and implicit in the Sampson et al.

(1997) scale has not thoroughly been assessed. Second, the original models used by Sampson et al. (1997) treated ordinal items as continuous (and normally distributed) responses, which is inconsistent with the nature of the items considered. Third, Rasch models and other single parameter IRT models assume that the shape of the response curve is equal across items; that is, items are equally discriminating and differ only in their "difficulty." This remains an empirical question that requires investigation. Fourth, the basic multilevel IRT model used by Sampson et al. (1997) assumes that there is no differential item functioning (DIF) across particular groups of respondents. Although the strategy adopted by Sampson et al. (1997) provides a mechanism for adjusting for individual differences in the response to the latent variable, this strategy does not guarantee that there will be no bias associated with particular items that are used to construct the scale. The presence of DIF can potentially compromise scaled estimates.

The current study expands the current understanding of the psychometric characteristics of the collective efficacy scale at the individual level and addresses many of these key questions. In doing so, a number of additional items were constructed to accompany the original set of items used by Sampson et al. (1997). An additional 19 items were included in the measure of collective efficacy across three main item domains: willingness to intervene, social cohesion, and capacity for social control (see Table 4 provided in Chapter III for a list of the total 29 items considered in this research). The psychometric properties of the extended perceptions of collective efficacy scale were then examined.

Perceptions of Collective Efficacy, Incivilities, and Fear of Crime

The second and third research questions of this research is whether an individual's perceptions of collective efficacy and social cohesion is associated with his/her perceptions of

incivilities, satisfaction with the police, and fear of crime and whether these relationships differ between neighborhoods. Neighborhoods characterized by higher levels of collective efficacy generally experience lower levels of physical and social disorder as residents exhibit a greater capacity and willingness to intervene in emerging problems. Collective efficacy consistently has been shown to be predictive of crime and disorder (Maxwell, Garner, & Skogan, 2011; Reisig & Cancino, 2004; Sampson, 2004; Sampson et al., 1997; Swatt, Varano, Uchida, & Solomon, 2013; Warner, 2007), community disorder (Plank, Bradshaw, & Young, 2009; Scarborough, Like-Haislip, Novak, Lucas, & Alarid, 2010; Swatt, Varano, Uchida, & Solomon, 2013; Wells, Schafer, Varano, & Bynum, 2006) and fear of crime (Gibson, Zhao, Lovrich, & Gaffney, 2002; Scarborough et al., 2010; Swatt et al., 2013; Wyant, 2008).

In the most explicit sense, collective efficacy is expected to result in "direct" intervention to ameliorate problems. Warner (2007), for example, argues that *direct informal social control* involves individuals who take personal action to address an issue, and *indirect informal social control* occurs when third parties (e.g., governmental authorities) are mobilized by residents. Intervention, however, can also occur through more indirect ways. Neighborhoods with higher levels of collective efficacy are also characterized by more authoritative parenting styles, which produce greater compliance with pro-social community norms, and less engagement in delinquency behavior (Simons, Simons, Burt, Brody, & Cutrona, 2005). Children growing up in efficacious neighborhoods are also less likely to be engaged in unstructured social activities (Maimon & Browning, 2012), thereby reducing the likelihood of their engagement in delinquency (Sharkey, 2006).

The role of collective efficacy and social cohesion in promoting safe, healthy community conditions is worth considering for several reasons. Wilson (1996), for example, observed that

neighborhoods could be understood as having social networks that were more or less effective at promoting order. Although disorder, violence, and victimization are generally associated with socio-economic status, there are additional social processes that either buffer or exacerbate structural conditions. It is clear that not all impoverished neighborhoods experience crime and disorder in the same ways and qualities of social networks play important roles in explaining these processes. It is, however, not merely the existence or even density of social networks that explains the capacity of neighborhoods to regulate behavior in a productive way. In fact, there may be strong self-regulatory features in neighborhoods that promote or at least tolerate disorder. Anderson's (1990) book *Code of the Street* clearly documents such a process. Similarly, St. Jean's (2007) book *Pockets of Crime* examines collective efficacy and the criminal point of view. Collective efficacy, in many ways, represents an integration of many of these ideas in that it encapsulates dimensions of density of social networks, the development of shared prosocial values, and a collective sense of agency that leads to direct or indirect action into problems. Thus, it is important to understand the sources of collective efficacy and the protective role it plays, particularly in at-risk communities.

Incivilities refer to the physical and social disorder associated with neighborhood environments (Armstrong & Katz, 2010; Gibson et al., 2002; Piquero, 1999). Physical disorder refers to signs of physical decay or neglect of space including the presence of litter, dilapidated and unmaintained buildings, graffiti, and similar problems. Physical disorder creates subtle cues to residents and nonresidents alike that disorder is tolerated, which further encourages additional disorder (Kelling & Coles, 1996; Wilson & Kelling, 1993). Incivilities represent the presence of physical and/or social disorder that have a noxious effect on the condition of neighborhood environments. Social disorder represents public-oriented social behavior that stands in contrast to

acceptable behavior. This includes public drinking, loud music, and other forms of boisterous behavior. Incivilities such as unattended physical environments and the regular presence of groups of unruly and disruptive youth can escalate the deterioration of neighborhoods and lead to crime (see Kelling & Coles, 1996; Maimon & Browing, 2012).

Incivilities play important roles in communities in several important ways. The presence of disorder reduces individuals' satisfaction and increases fear of crime (Robinson, Lawton, Taylor, & Perkins, 2003). The relationships between incivilities and fear appear to be both direct and indirect. Gibson et al. (2002) found that neighborhood disorder significantly increased fear of crime, and significantly reduced collective efficacy. The effects of disorder, however, are mitigated by collective efficacy. Research supports that these relationships are consistent across a diverse set of communities (Gibson et al., 2002; Scarborough, Like-Haislip, Novak, Lucas, & Alarid, 2010).

The current research expands the current understanding about the interconnectedness between an individual's perceptions of collective efficacy and social cohesion and perceptions of incivilities, satisfaction with the police, and fear of crime. To accomplish this, structural equation models were constructed to link these concepts and incorporate additional factors, which may impact these relationships. Further, Swatt et al. (2013) identified heterogeneity in these relationships between neighborhoods with a subsample of four of the eight neighborhoods surveyed. Specifically, they found that the relationship between perceptions of collective efficacy and fear of crime showed different magnitudes between neighborhoods and even became non-significant in some neighborhoods. This finding suggests that important characteristics about the neighborhood (such as neighborhood socioeconomic status or population heterogeneity) moderate the relationship between perceptions of collective efficacy

and fear of crime. In other words, the relationship between perceptions of collective efficacy and fear of crime may be significant in impoverished neighborhoods but not significant in middle class or wealthy neighborhoods. Fortunately, it is fairly straightforward to examine this hypothesis by estimating the same structural equation model for each neighborhood and comparing the results.

Use of Neighborhood Resources and Perceptions of Collective Efficacy and Social Cohesion

The fourth research question explored in the current research is how does the use of particular neighborhood resources (such as neighborhood grocery stores, churches, and parks) affect perceptions of collective efficacy. To date, there has been extensive research on the relationship between neighborhood structural variables and collective efficacy (see Sampson, 2012). As Sampson (2009, 2012) suggests, there is evidence that social functioning variables, such as collective efficacy, mediate the relationship between these structural variables and deleterious community outcomes. As such these structural variables, such as chronic poverty, unemployment, family dissolution, racial segregation, and others, serve to undermine a community's capacity for self-regulation (Sampson, 2009). Other research indicates that organizations and voluntary associations within a neighborhood serve to enhance collective efficacy (Morenoff, Sampson, & Raudenbush, 2001). Finally, there is also evidence for feedback effects where outcomes such as crime within a community serve to undermine collective efficacy (Sampson, 2012). From this research, a fuller understanding of the influence of structural variables on the development of collective efficacy within a neighborhood is improving.

Less studied, however, is the idea that particular resources within a community can enhance social functioning within a neighborhood. Specific neighborhood resources, such as

grocery stores, parks and playgrounds, community centers, libraries, churches, and other similar locations provide a spatial location where residents within a neighborhood can interact and share information, thus fostering the development of weak ties and possibly working trust between residents. Further, these neighborhood resources may also serve very direct functions in the process of mobilizing residents within a community to address problems. For example, community centers and churches may provide a specific meeting place for community meetings to address problems. Programs to address particular problems or meet the needs of community residents may be advertised in local grocery stores, libraries, or churches. Finally, these types of locations often comprise important components of the infrastructure within a community, in many cases governing the distribution of important services and providing employment to community residents. For these reasons, and others, it seems appropriate to hypothesize that the availability of such resources impacts the level of collective efficacy within a neighborhood.

While we could not directly test this hypothesis as it is not possible for extensive comparisons between neighborhoods, we can provide insight about the reasonableness of the hypothesis by examining the relationship between the use of these resources and perceptions of community social functioning. If these community resources are associated with levels of collective efficacy within a community, it stands to reason that a similar effect should be observed in regard to individual perceptions of community functioning. That is, higher levels of use of these resources should translate into heightened perceptions of neighborhood social functioning as these residents would be better integrated into their communities. In the current research, these possibilities are examined with a number of exploratory analyses.

Local Variation in Neighborhood Functioning

The final question of interest in this research is whether collective efficacy and social cohesion vary between locations within neighborhoods. Prior research from the social disorganization perspective has emphasized the neighborhood as the prominent unit of analysis (see Bursik & Grasmick, 1993 for example). Collective efficacy, therefore, is treated as an emergent property of neighborhoods. Investigations of collective efficacy then often involve comparisons between neighborhoods or multilevel investigations that nest residents within these discrete larger units (see Sampson et al., 1997). Although there is some agnosticism regarding the exact definition of the neighborhood and construction of neighborhood boundaries (see Sampson, 2012), the emphasis on measurement within these larger units remains, whether the boundaries are determined empirically or inferred from convenient administrative boundaries such as Census tracts, block groups, zip codes, voting districts, or other officially designated place boundaries.

There is reason to suspect, however, that there is important variability within neighborhoods regarding social functioning. The hotspots literature indicates that not all locations within a neighborhood, even a high crime neighborhood, possess equal risk for criminal activity (see Sherman, Gartin, & Buerger et al., 1989; Roncek, 1981). Instead criminal activity may be constrained within smaller areas within a neighborhood, such as particular addresses (Sherman et al., 1989) or blocks (Roncek, 1981). As Taylor (1997) argues, smaller ecological units of analysis, such as face blocks, may be important for understanding the distribution of crime risk within neighborhoods. Unfortunately, very little research has been done to determine whether there exists within-neighborhood variability in social functioning. This lack of attention can be traced to the methodological decisions made by neighborhood researchers. To

reduce project costs, there is incentive to minimize the number of survey respondents within neighborhoods. As Raudenbush and Sampson (1999a, 1999b) note, very reliable aggregate measures of neighborhood social functioning variables can be obtained with relatively small numbers of respondents within neighborhoods. The net consequence of this strategy is that while there are sufficient numbers of respondents to reliably estimate neighborhood-level constructs, there are too few respondents within neighborhoods to examine patterns of within-neighborhood variation.

In the current research project, we explicitly decided to maximize the number of respondents within neighborhoods by focusing on a smaller subset of neighborhoods rather than all neighborhoods within Miami-Dade County. While we limited our ability to make between-neighborhood comparisons beyond simple descriptions, we increased our ability to determine whether there is heterogeneity of social functioning within neighborhoods. In doing so, each survey respondent is treated as a *rater* of neighborhood functioning, but this rating is in turn tied to the spatial location of the residence for each respondent. Borrowing from the field of geostatistics, we employ a technique known as *kriging* to estimate the local variation of social functioning within a neighborhood by interpolating a smooth spatial surface for collective efficacy and other neighborhood social functioning variables for each neighborhood. Patterns observed in these interpolated surfaces then provide information regarding the degree of relative local heterogeneity in social functioning that exists within neighborhoods.

A Guide for the Reader

This report is divided into nine chapters. In the current chapter we discussed a brief overview of the major research questions. Chapter II describes the overall methodology of the

project. This includes the method through which neighborhoods were selected for study and the manner in which these neighborhoods were delineated; the sampling strategy within each neighborhood; the method for collecting data through community surveys; and the methods employed for the systematic social observations.

The next five chapters (III through VII) present the results from our analyses of the key research questions. For ease of reading, each of these chapters begins with a brief abstract. Chapter III discusses the findings from the psychometric evaluation of the expanded measure of collective efficacy. It includes the assessment of the dimensionality of the measure, the selection of items for a revised scale and measurement properties of this scale, and an assessment of differential item functioning for these items.

Chapter IV discusses the findings of the examination of the relationships between perceptions of collective efficacy, perceptions of incivilities, satisfaction with the police, and fear of crime. A structural equation model is developed and tested with all respondents pooled across neighborhoods. In Chapter V, this structural equation model is then examined for each neighborhood separately and comparisons are made to determine the extent to which there is between neighborhood heterogeneity in the relationships between these variables.

Chapter VI presents the findings from the exploratory analyses on the relationships between perceptions of collective efficacy and similar variables and usage of neighborhood resources. The results conclude in Chapter VII with a discussion of the variability of collective efficacy within neighborhoods. In this chapter, a number of kriging maps are presented and discussed to highlight patterns of social functioning within each neighborhood.

The conclusions from this research are discussed in the final two chapters of this report. Chapter VIII summarizes the main results from this research and makes specific suggestions for

future research on collective efficacy. We provide specific suggestions for future points of inquiry that build upon the results of the current study. Finally, Chapter IX presents the implications of the current research for policy and practice. This chapter includes a discussion of the potential benefits offered through examining and exploiting local variation in neighborhood social functioning.

CHAPTER II. METHODOLOGY OF THE PROJECT

Miami-Dade County, Florida

Miami-Dade County is located along the southern shore of Florida and is the most populous county in Florida with 2,496,435 residents; making it the eighth most populous county in the United States (US Census Bureau, 2012;). The county is approximately 1,900 square miles in size and encompasses three cities with over 100,000 residents (Miami – 399,457; Hialeah – 224,669; and Miami Gardens – 107,167) and 32 other cities, towns, or villages. Miami-Dade County is bordered by Broward County, Monroe County, and Collier County. Miami-Dade also includes portions of the Everglades National Park to the west and Biscayne National Park and Biscayne Bay Aquatic Preserves to the east (Miami-Dade County, 2012).

Approximately 74% of the county's population is White, but only 15.4% of these residents report no Hispanic ancestry. Around 19% of the residents are Black and the remaining residents are split among other racial designations, including multiple race categories. Residents reporting Hispanic ancestry of any race constitute 65% of all residents). Further, 51% of residents report being born outside the United States. Of residents over the age of 25, approximately 77% of the population report being high-school graduates and 26% report receiving Bachelor's degrees or higher (US Census Bureau, 2012). The residents live in 989,435 residential housing units with an average of 2.88 persons per occupied household. The median household income from 2006-2010 was $43,605 and 17.2% of the population reported living below the poverty level (US Census Bureau, 2012). Nearly 47% of the housing units are in multi-unit structures and the median value of owner-occupied housing units is $269,600 (US Census Bureau, 2012), but this number is inflated as it includes data prior to the collapse of the residential housing market.

There are 41 separate police agencies operating in Miami-Dade County. In regard to the scale of the crime problem, Figure 1 presents the Uniform Crime Reports annual rates per 100,000 persons for Type I property crimes for Miami-Dade County. Allowing for standard concerns regarding the quality of the UCR data, there has been a clear downward trend for property crime rates since 1995. Figure 2 presents the UCR annual rates per 100,000 for Type I violent crimes for Miami-Dade County. Again, there is a clear downward trend in violent crime. Although the scale of the axis makes it difficult to observe, this downward trend is also observed for forcible rape and murder.

Neighborhoods Examined in the Study

For this research project, a total of eight neighborhoods were selected for investigation. Research on four neighborhoods was funded by The Children's Trust of Miami-Dade County and research on the remaining four was funded by the National Institute of Justice. For the purposes of leveraging resources from both funding organizations, the findings in this report pertain to all eight neighborhoods under investigation. Three neighborhoods, Brownsville, Bunche Park, and East Little Havana were selected by The Children's Trust for investigation because they represented areas of considerable interest to the funding agency. In order to examine a diverse cross-section of neighborhoods the remaining five areas were purposively selected on the basis of demographic, socioeconomic, and criminological variables to generate a sample of neighborhoods that represented a range of different characteristics and reflected the diversity of neighborhoods in Miami-Dade County.

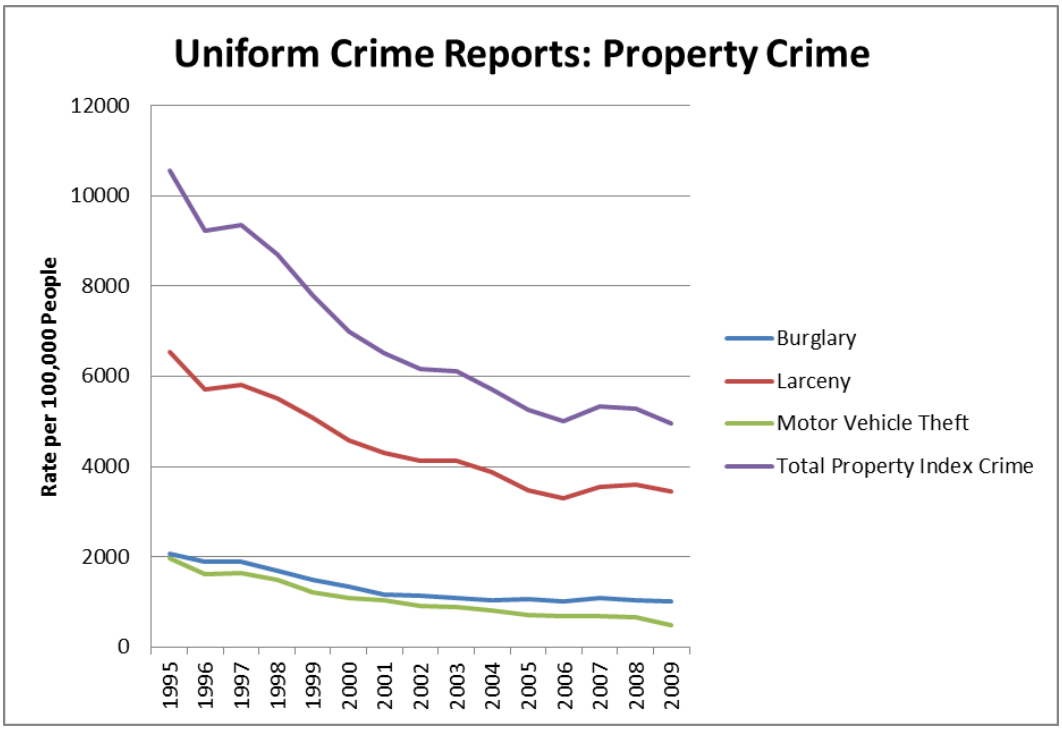

Figure 1. Uniform Crime Reports Property Crime Rates in Miami-Dade County, 1995-2009

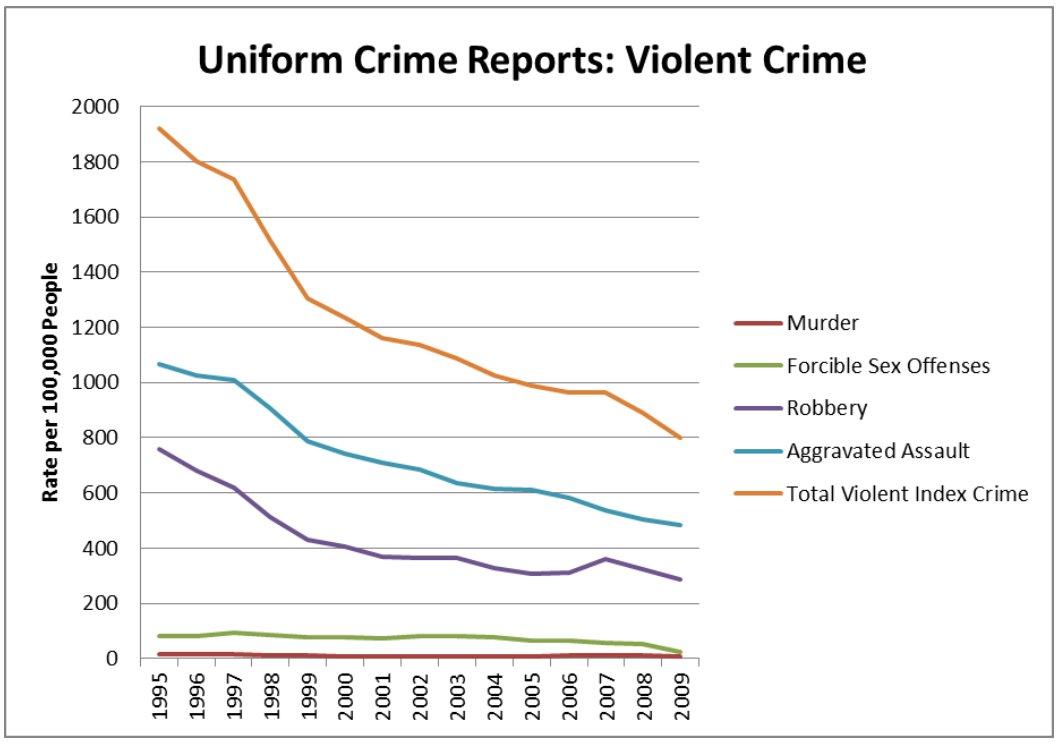

Figure 2. Uniform Crime Reports Violent Crime Rates in Miami-Dade County, 1995-2009

Specifically, we compiled existing 2000 and 2010 Census data, included projections of demographic data based on the 2000 Census, collected and analyzed homicide data from the County Medical Examiner, and analyzed calls for service data from the Miami-Dade Police Department, City of Miami Police Department, the Miami Gardens Police Department, and the Homestead Police Department.[1] These data were used in a GIS platform to assist researchers in identifying suitable candidate neighborhoods for inclusion into the study. Considerations regarding the availability of future data, cooperation by various agencies within the neighborhood, and likelihood of gaining access to the neighborhood for on-site residential surveys were also made. A number of candidate neighborhoods were identified and initial neighborhood boundaries for these areas were created in consultation with neighborhood boundaries delineated by local governmental agencies in Miami-Dade County (such as the planning department), similarities in demographic and socioeconomic characteristics reflected in Census data, common land use (such as schools and parks) that serve as central focal points for the surrounding neighborhood, distinct "breaks" in land use (e.g., moving from predominantly residential to commercial property, change in residential housing stock or quality), and transportation/hydrology boundaries. Many of these features were identified using orthophotography visualizations in conjunction with "street view" information from Google Earth. Members of the research team also visited these candidate neighborhoods to assist in the selection process, as well as to further specify neighborhood boundaries. Eight neighborhoods

[1] Although there are gaps in available data from particular agencies (calls for service from Hialeah being the largest gap), the majority of Miami-Dade County is serviced by these agencies. Further, these data provide coverage for most of the neighborhoods under consideration for the study and all of the neighborhoods that were actually selected.

were selected for study: Brownsville, Bunche Park, East Little Havana, Seminole Wayside Park, Kendall Hammocks Park, Ives Dairy Estates, Auberdale, and Coral Reef Park. These neighborhoods represent a diverse cross-section of neighborhoods across the County.

Brownsville lies within an unincorporated neighborhood of mixed residential and commercial properties partly located in the core urban area of the City of Miami and partly within the north central corner of Miami-Dade County. The City of Miami and the Miami-Dade Police Departments provide policing services in their respective jurisdictions. While approximately 39,000 people live in the Brownsville/Liberty City area, this study encompasses a smaller section of approximately 10,731 people that reside in an approximately 40-block area within a hotspot of violent crime and homicide. According to the 2010 Census the racial distribution was 2% White, 96% African American, and 2% of other races. Hispanic or Latino of any race was a little over 3% of the population (ESRI, 2010). This neighborhood is predominantly low in socioeconomic status and experiences one of the highest rates of crime in the County. Brownsville/Liberty City accounted for 120 homicides or approximately 11 percent of all homicides in Miami Dade County from 2004 to 2008 (Uchida et al., 2011).

Bunche Park lies within the City of Miami Gardens and includes Bunche Park, Bunche Elementary School, and surrounding residential housing. Miami Gardens, incorporated in May 2003, is one of the newest cities in Miami-Dade County. With a population of over 105,457 and an area of approximately 20 square miles, it is the County's third largest city and is the largest predominantly African American municipality in Florida. Bunche Park is a predominantly a low socioeconomic status neighborhood within Miami Gardens that experiences high rates of crime (Uchida et al., 2011). The Bunche Park neighborhood is physically located near the border of the city of Opa-locka, consists of the residential area bordering a city park, and encompasses

approximately 1,155 residents. To ensure a sample of sufficient size, additional residential areas lying on the periphery of Bunche Park were also included in this neighborhood. Over 94% of residents identify as African-American, 2% as White, and 4% as some other racial group. Only a little over 4% of residents identify any Hispanic ancestry (ESRI, 2011).

East Little Havana lies within the ethnic enclave, Little Havana, in the City of Miami, and is famous as a cultural and political capital of Cuban Americans. Little Havana has a population estimated at 49,000 residents. The neighborhood mostly consists of immigrants from the Caribbean, Central America, and South America. The predominant language is Spanish. While Cuban immigrants constituted the original wave of immigrants into this area of Miami; recently, Nicaraguan and Puerto Rican immigrants have also moved into the neighborhood. This research focused on the northeastern corner of Little Havana, which covers a predominantly Hispanic, low socioeconomic status, and high crime neighborhood (Uchida et al., 2011). According to 2010 Census data, there are approximately 9,149 residents living in East Little Havana. Of these, approximately 80% identify as White, 3% as African-American, and 16% as some other race. Nearly 96% of residents identify some Hispanic ancestry (ESRI, 2011). The city of Miami is responsible for providing policing services to this community.

Seminole Wayside Park is a racially and ethnically heterogeneous, low-income, moderate crime neighborhood that lies in the southern part of Miami-Dade County, within the Census-designated place of Leisure City. This particular neighborhood is in the southern part of Leisure City and includes a small part of the northern boundary of Homestead and receives policing services from the Miami-Dade County Police Department (Uchida et al., 2011). This neighborhood has a moderate to low level of socioeconomic status and experiences a moderate amount of crime. According to the 2010 Census, 69% of residents identify themselves as White,

13% as African-American, and 18% as some other race. Approximately 76% of residents indicate some Hispanic ancestry (ESRI, 2011). The Miami-Dade County Police Department is responsible for policing this neighborhood.

Kendall Hammocks Park is a neighborhood located in the Southwestern region of Miami-Dade County. Kendall is a racially mixed area with a moderate socio-economic status and has a moderate level of crime. While the Miami-Dade County Police Department has the responsibility of policing this area, many of the communities in Kendall have additional security gates and private security guards who patrol the area throughout the day. The Kendall Hammocks Park neighborhood lies within Kendall and is close to many parks and schools. There are 13,348 residents in this neighborhood. Eighty-six percent of the residents are White, 3% are Black, and 73% are of Hispanic origin (ESRI, 2011).

Ives Dairy Estates is a neighborhood that lies in the northern-most part of Miami-Dade County, abuts the Broward County border, and is surrounded by schools and parks. Ives Estates is an area of mixed racial/ethnic composition, low crime, and moderate socio-economic status. The total population of the area is 4,435, where 53% of the population is White, 31% is Black, and approximately 33% of the residents are of Hispanic origin (ESRI, 2011). The community of Ives Dairy Estates is made up of mostly single-family homes. The Miami-Dade County Police Department provides policing services to this community.

Auberdale is located in the middle part of Miami-Dade County. It has a population of 10,518 residents. Approximately 91% of residents identify as White, 1% as African-American, and 8% as some other race. Nearly 95% of the individuals living in Auberdale are of Hispanic origin (ESRI, 2011). Although this community is similar to East Little Havana in its racial and ethnic composition, the average household income is almost double that of East Little Havana.

While the community of Auberdale is close to Little Havana, the crime level of this community is much lower. There are more single-family homes and it is further away from the downtown area of the city of Miami. Auberdale receives police services from the Miami-Dade County Police Department.

Coral Reef Park is located in southeast Miami-Dade County within the Cutler/Palmetto Bay region. Approximately 4,436 residents live in this predominantly affluent, single-family home neighborhood. Approximately 87% of the population was White, 4% African-American, and 9% some other race. Nearly 38% of the population was of Hispanic origin. The average household income for a family living in Coral Reef Park is $127,705, and almost 20% make over $150,000 (ESRI, 2011). Coral Reef Park has a popular neighborhood watch program that contributes to its low levels of crime. The small city contracts its police services to the Miami-Dade Police Department and is considered its own police reporting district within the County.

Figure 3 presents a map of Miami-Dade County that shows the neighborhoods under investigation. Selected Census 2010 information about the demographic and socioeconomic characteristics of each of these neighborhoods was obtained from ESRI reports and this information is provided in Table 1 along with Census 2010 information for Miami-Dade County as a whole for comparison purposes (ESRI, 2011). These neighborhoods served as the basis for residential surveys and systematic social observations of street segments.

Resident Surveys

In order to better understand the operation of collective efficacy within these communities, we administered a series of in-person residential surveys within these eight neighborhoods. The sampling frame was enumerated using a database obtained from Valassis Corporation containing all active mailing addresses known to the United States Postal Service

(USPS) for Miami-Dade County. Valassis is one of a handful of certified USPS partners and receives updates to address data electronically from the USPS on a daily basis. They have a robust process in place for continually "scrubbing" addresses on a weekly basis based on information collected by change of address forms, and also information provided by postal carriers about unaccounted for vacancies. The Valassis database is considered the "master address" list used by the USPS, and is the only list approved for use during the mailing of the decennial census and can be considered the most current and accurate listing of all addresses in the United States at any given point in time. This database was used to enumerate all valid mailing addresses within the eight neighborhoods under investigation.

From this database, a random sample of households was selected from each neighborhood. The target number of responses per neighborhood was approximately 150 residents. A team of interviewers consisting of residents of these neighborhoods was selected and trained to administer the field surveys, walking from household to household and conducting in-person surveys with a resident of the household aged 18 or older. In order to reduce costs, we adopted an "entrepreneurial" model, where interviewers were paid according to the number of interviews completed. While this strategy helped reduce the total cost of the survey, it required careful monitoring to ensure accurate and truthful survey administration as well as adherence to the sampling protocol. In order to ensure accuracy of the responses, the field supervisor conducted telephone validations for approximately 10 to 15 percent of the surveys.

If the initial attempt to contact a resident of the household was unsuccessful, a flier (in English and Spanish) explaining the study and including contact information was left at the residence to allow residents to schedule interview times that were more convenient. In addition,

multiple attempts to contact a resident of the household were made at various times and days of the week. After four attempts or a refusal to participate in the interview, a household was

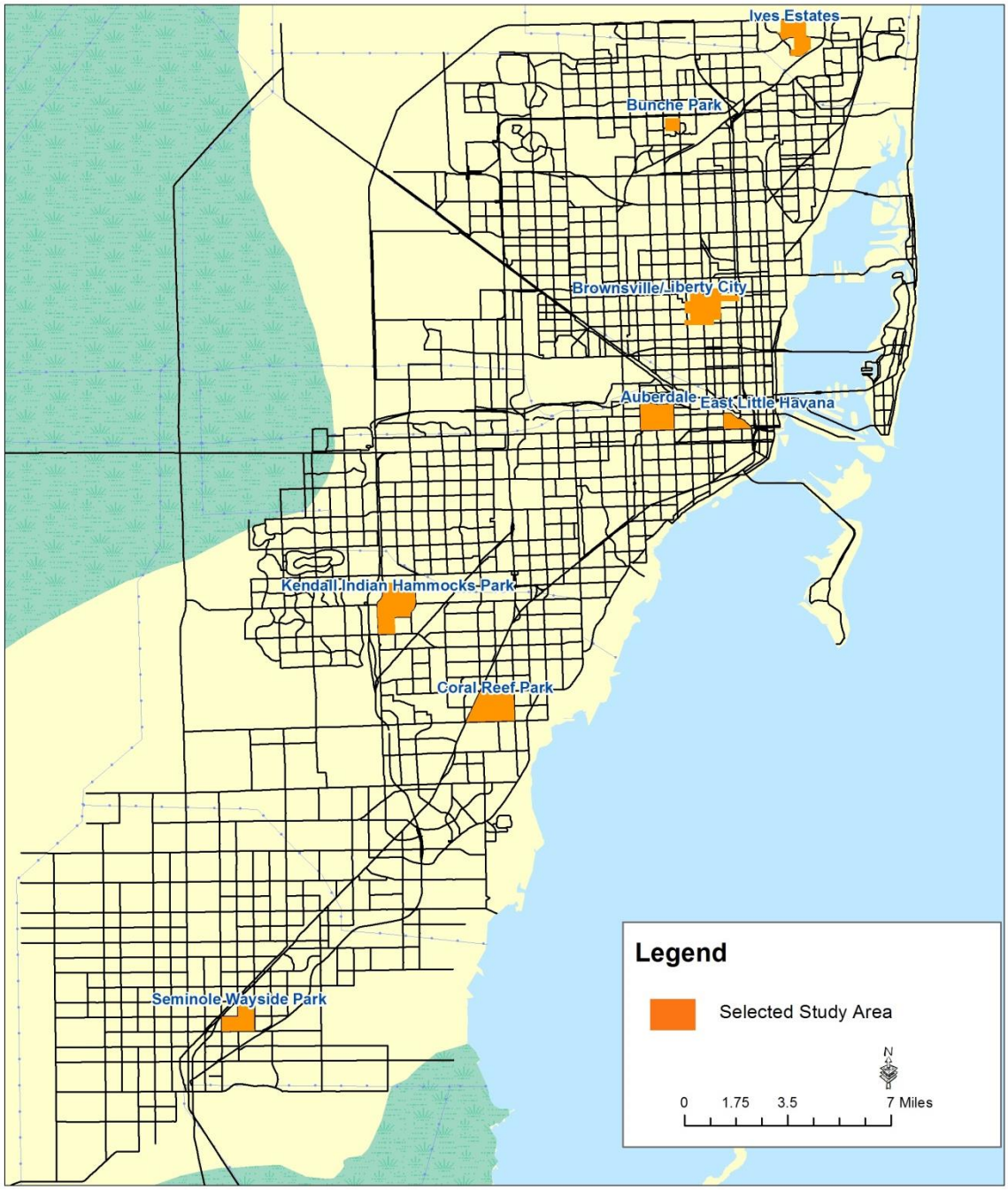

Figure 3. Map of Selected Neighborhoods in Miami-Dade County.

Table 1. Neighborhood Profiles from 2010 Census

	Miami-Dade County	Brownsville	Bunche Park	East Little Havana	Seminole Wayside Park	Kendall Hammocks Park	Ives Dairy Estates	Auberdale	Coral Reef Park
Population									
Total 2010 Population	2,463,726	10,731	1,155	9,149	4,293	13,348	4,435	10,518	4,436
% Change 2000	9.3%	-7.7%	-4.9%	20.8%	-5.1%	1.9%	0.6%	-1.7%	-2.1%
Median Age	37.0	26.0	36.5	37.3	28.7	37.1	38.1	44.5	41.1
% Age < 18	23.4%	38.4%	27.6%	21.5%	31.2%	20.3%	23.3%	19.0%	27.3%
% Age 65+	14.1%	10.1%	14.5%	15.6%	7.7%	13.9%	14.0%	23.1%	12.9%
# Households	846,319	3,401	391	3,386	1,199	4,927	1,522	3,494	1,520
Racial/Ethnic									
% White (no other race)	71.4%	1.9%	1.6%	80.2%	69.2%	86.2%	53.0%	90.7%	87.2%
% Black (no other race)	17.7%	96.1%	94.2%	3.4%	12.9%	3.0%	30.8%	1.1%	4.0%
% Other Race	10.9%	2.0%	4.2%	16.4%	17.8%	10.8%	16.3%	8.3%	8.8%
% Hispanic Origin (any race)	64.3%	3.4%	4.4%	95.7%	76.4%	73.4%	32.8%	94.6%	37.6%
Education (Age 25+)									
% No High School Degree	22.3%	33.8%	28.4%	55.3%	40.4%	9.2%	8.7%	41.0%	5.1%
% High School Degree	27.3%	41.9%	47.8%	27.8%	38.4%	23.4%	30.1%	27.4%	14.0%
% At Least Some College	50.4%	24.4%	23.7%	16.9%	21.2%	67.4%	61.2%	31.5%	80.8%
Economic Characteristics									
Median Household Income	$46,323	$15,416	$22,568	$18,047	$34,452	$55,053	$51,940	$34,241	$127,705
Median Home Value	$154,410	$72,991	$79,286	$92,069	$109,880	$139,384	$113,822	$156,587	$326,730
% Owner Occupied	50.0%	21.7%	66.4%	8.3%	49.1%	53.2%	77.2%	45.6%	75.8%
% Civilian Age 16+ Unemployed	15.5%	31.5%	24.1%	26.3%	21.1%	12.6%	14.2%	17.0%	7.5%
Marital Status (Age 15+)									
% Never Married	33.6%	56.7%	34.2%	37.1%	36.3%	30.8%	33.3%	25.0%	23.4%
% Married	48.1%	24.1%	34.0%	43.2%	51.2%	46.9%	46.1%	53.4%	63.2%
% Divorced	12.1%	11.9%	14.9%	13.4%	9.7%	14.7%	13.4%	13.5%	8.2%

considered non-responsive and a replacement household was randomly selected from the Valassis database. Table 2 provides information about the response rates and final sample size for the eight neighborhoods.

The survey consisted of a number of questions that included basic demographic information, an expanded measure of collective efficacy designed as part of this study, measures of perceptions of incivilities and other neighborhood problems, measures of fear of crime and prior victimization, measures of the perceived satisfaction of police services, as well as other information. The instrument used for the resident surveys is included in Appendix A. Surveys were conducted in English, Spanish, and Creole depending upon the language of choice of the respondent.

Systematic Social Observations (SSOs)

In addition to resident surveys, trained research staff conducted systematic social observations (SSOs) of street segments in selected neighborhoods. A team of at least three trained researchers conducted walkthroughs of these street segments to conduct the SSOs. The day of the week and time of day for each of these walkthroughs varied to avoid systematic biases associated with the timing of the walkthroughs. The research team jointly completed an SSO instrument for each street segment that included physical (vacant buildings, litter, presence of graffiti, etc.) and social (persons observed and their activities) indicators. Information regarding the number of SSOs conducted in each neighborhood is presented in Table 3. The instrument used for the SSOs is included in Appendix B.

Street segments were operationalized as the "face block" or set of properties facing each other along a common street lying between two intersections. In each neighborhood,

approximately 20 percent of street segments (with a minimum of 23 segments per neighborhood) were selected for SSOs. When selecting the segments, the neighborhoods were first divided into quadrants and street segments were selected by randomly sampling the addresses of survey respondents within each quadrant. While segments with greater numbers of residents have a disproportionately higher probability of selection, this disadvantage is outweighed by the advantage in linking the individual resident survey responses to SSO street segments.

Table 2. Sample Sizes and Response Rates for Each Neighborhood[1]

	Brownsville	Bunche Park	East Little Havana	Seminole Wayside Park	Kendall Hammocks Park	Ives Dairy Estates	Auberdale	Coral Reef Park	**TOTAL**
Surveys Attempted	201	201	191	200	217	182	185	171	1548
Vacant or Not Applicable Addresses			9	8	6	1	5	0	
Non-Interviews/Refusals			27	29	48	27	16	0	
Surveys Not Passing QA Procedure			0	0	1	0	0	2	
Surveys Complete	124	136	155	163	162	154	164	169	1227
English			16	85	96	119	27	154	
Spanish			139	78	66	35	137	15	
Response Rate	61.69%	67.66%	81.15%	81.50%	74.65%	84.62%	88.65%	98.83%	79.26%

1. Surveys for Brownsville and Bunche Park were conducted by an outside vendor and details regarding nature of non-response and language of the survey are unavailable.

Table 3. Systematic Social Observation Sample Information

	Brownsville	Bunche Park	East Little Havana	Seminole Wayside Park	Kendall Hammocks Park	Ives Dairy Estates	Auberdale	Coral Reef Park
Number of Segments Sampled	52	23	25	31	25	25	25	29
Respondents in Sampled Segment								
1	28	13	7	15	14	11	11	21
2	13	6	5	5	2	5	7	5
3	6	2	2	3	1	4	5	1
4 or more	5	2	11	8	8	5	2	2
Maximum	6	5	7	18	14	8	5	4
Average	1.83	1.74	2.96	2.68	3.56	2.40	1.96	1.45

CHAPTER III. PSYCHOMETRIC PROPERTIES OF THE NEW COLLECTIVE EFFICACY SCALE[2]

Abstract

In this chapter, we examine the psychometric properties of the expanded perceptions of collective efficacy scale. When creating the expanded scale, we identified three main "item domains" from the original Sampson et al. (1997) scale: willingness to intervene, social cohesion, and capacity for social control. Nineteen additional items from these domains were then added to the original items, nearly tripling the length of this scale. The first step for examining the properties of this scale was assessing the dimensionality of the revised scale. Exploratory bifactor factor analysis methods and a bifactor item response model were used to examine whether the scale is unidimensional. The results from these models indicated that the expanded scale was *multidimensional* as the bifactor models appeared to best represent the underlying factor structure of the data. Willingness to intervene and capacity for social control items loaded strongly on the latent general factor of collective efficacy. Social cohesion items, however, had significant loadings on collective efficacy, but also retained substantial loadings on the group factor for social cohesion.

The second step in assessing the psychometric properties of the expanded scale involved identifying problematic items and removing them from the scale. Nine items were dropped from the scale due to substantial differential item functioning biases or very high levels of local item dependence. The remaining 20 items constituted the final set of items in the expanded collective efficacy scale. While the remaining items demonstrated substantially improved functioning, unresolved problems with local dependence and item fit remain. The collective efficacy dimension showed high reliability for measurement near the mean, but the test information dropped substantially for values greater than 0.75 and less than -1.5 standard deviations from the mean. The social cohesion dimension showed high precision between -1.5 and -0.5 standard deviations and 1.0 and 1.5 standard deviations from the mean. These items appeared to have difficulty in discriminating responses near the mean of the latent variable.

The final step in assessing the psychometric properties of this scale involved assessing the degree of differential item functioning in the remaining items. The results suggested that considerable differential item functioning remained for items in the social cohesion dimension. Coupled with the results from the construction of the final scale, these results suggest that there would be considerable benefit in further efforts to refine the measurement of perceptions of collective efficacy and social cohesion.

[2] Material from this section comes in part from results presented in Swatt et al. (2012a, 2012b). Expanded results and discussions beyond what is contained in these manuscripts are included when appropriate.

Overview

Raudenbush and Sampson (1999a, 1999b; Sampson, 2002) introduced the concept of "ecometrics" to refer to the study of the quality of measurement for social aggregates. Their main approach towards ecometrics draws from two major strands of research in psychometric theory: item response theory and generalizability theory. Item Response Theory (IRT) models the responses to items comprising a scale as a function of both the "difficulty" of an item and an individual's "ability" based on a score on the latent variable underlying item responses (Nunnally & Bernstein, 1994). Generalizability theory is often used to examine the reliability of multiple raters of one or more constructs (Nunnally & Bernstein, 1994). In the context of the study of collective efficacy, individual respondents contribute separate ratings of the level of collective efficacy within a neighborhood. Individual responses to the scale are modeled using IRT models to estimate the latent variable that comprises their *perception of collective efficacy* within their neighborhood. These latent variables are then treated as separate ratings from multiple "judges" and are used to develop an aggregate measure of *collective efficacy* for the neighborhood. The variability in these latent perceptions of collective efficacy can then be used to assess the reliability of the aggregate measure (see Raudenbush & Sampson, 1999a). In this way, it is possible to control for measurement error that arises as a product of item responses as well as the variability in individual's responses within each neighborhood.

In merging these approaches, Raudenbush and Sampson (1999a) rely on a three-level IRT Generalized Hierarchical Linear Model (GHLM) framework. The simplest version of this model can be expressed as nesting item responses (a Rasch model) within individuals and nesting individuals within social aggregates, such as neighborhoods. Using Raudenbush and

Bryk's (2002, p. 366; also Raudenbush & Sampson, 1999a) notation[3], the model can be expressed as:

$$\eta_{ijk} = \ln\left(\frac{\varphi_{ijk}}{1-\varphi_{ijk}}\right) \quad , \quad Y_{ijk}|\varphi_{ijk} \sim \text{Bernoulli} \qquad \text{Eq. 1}$$

$$\eta_{ijk} = \pi_{0jk} + \sum_{p=1}^{P-1} \pi_{pjk} X_{pijk} \qquad \text{Eq. 2}$$

$$\pi_{0jk} = \beta_{00k} + u_{0jk} \quad , \quad u_{0jk} \sim N(0, \tau_{00}) \quad , \qquad \text{Eq. 3}$$

$$\pi_{pjk} = \beta_{p0k} \quad \text{for } p > 0$$

$$\beta_{00k} = \gamma_{000} + v_{00k} \quad , \quad v_{00k} \sim N(0, \omega_{00}) \quad , \qquad \text{Eq. 4}$$

$$\beta_{p0k} = \gamma_{p00} \quad \text{for } p > 0$$

Equation 1 expresses the link function as Bernoulli for dichotomously scored items. While the original formulation of the Rasch model focused on dichotomously scored items, alternative link functions can be used for alternative scoring metrics, such as continuous, count, or ordinal items (see Raudenbush & Bryk, 2002 for a discussion of alternative link functions in the GHLM framework).

Equation 2 expresses the nesting of the responses to items in the collective efficacy scale within individual respondents. Under the Rasch framework, an individual response to an item is determined by a combination of the individual's latent "ability" (indicated here as π_{0jk}) and the "difficulty" of the item. The latent ability simply refers to the underlying value of the latent variable for a given individual. Item difficulty is often defined in relation to the probability of endorsing a particular item at a given fixed level of latent ability. In conventional Rasch models, the logit curves expressing the probability of endorsing items for a given ability are assumed to

[3] For the purposes of simplicity in the discussion, we are ignoring the issue of mean centering of the various item responses. Often, this model is described using centered variables to facilitate the interpretation of parameters within the model (see Raudenbush & Bryk, 2002; Raudenbush & Sampson, 1999a).

be parallel. Therefore, the difficulty of a particular item can be observed as a fixed difference between the values of item curves for any value of the latent ability (*i.e.*, the difference in intercepts between the logit curves). Under the Rasch model, items with higher difficulty will be less likely to be endorsed at all levels of latent ability. In Equation 2, there are p items and the difficulty of a reference item is set to zero. There are $p - 1$ difficulty parameters expressed as π_{pjk} that correspond to the relative difference in the log-odds of the probability that the response is equal to one. These difficulty parameters can then be transformed into the normal metric for the purposes of interpretation. The X variables represent a system of dummy variables for each item. Further, as Raudenbush and Bryk (2002, p. 366) indicate, separate subscripting for item responses and occasions is used to adjust for situations where individuals do not respond to all items (either by design or due to missing data for item responses).

Equation 3 simply nests the item responses within individuals and expresses the abilities as varying between individuals. Importantly, under the conventional Rasch model, item effects are treated as fixed across the population. Equation 4 nests the individuals within larger social aggregates, such as neighborhoods. This allows for the clustering of latent abilities (or latent scores) within these larger units. Aggregate measures for average latent abilities can be obtained by computing Empirical Bayes estimates for γ_{000} for each social aggregate.

Relating these back to the study of collective efficacy, Equation 2 links the individual item responses on the collective efficacy scale with the latent score for collective efficacy. Equation 3 expresses the linkage between the items of the collective efficacy scale and the individual scores for their perception of collective efficacy within their neighborhood. Equation 4 relates these perceptions of collective efficacy to an aggregate score for collective efficacy

within a neighborhood. These aggregate scores are then used in research (typically from the PHDCN) for the measure of collective efficacy within a neighborhood.

While most applications of this model for the study of collective efficacy have employed this basic Rasch model, there are some important concerns with the basic model. Often the assumptions of the Rasch model are overly restrictive. Without substantial testing and validation, it is difficult to argue that these assumptions are generally applicable. Fortunately, there is substantial flexibility in the IRT GHLM framework that allows for a relaxing of these assumptions. First, while the conventional Rasch model was developed for dichotomously scored items, many of the measures commonly employed in social research are measured using alternative metrics, commonly ordinal items for multiple response categories. As previously mentioned, adjusting for this is a simple matter of selecting an appropriate link function in Equation 1. Second, in many IRT applications, the assumption of parallel logit curves for items is overly restrictive. Items often differ in terms of their precision in measurement as some items better "discriminate" between individual responses at various levels of the latent ability. This leads to the introduction of a discrimination parameter that reflects the slope of the logit curve for each item and yields the two-parameter IRT model. Again, the GHLM model can be expanded to incorporate this extra complexity (for example, see Zheng & Rabe-Hesketh, 2007)

Two additional related concerns are multidimensionality and local item dependence. While these may arise for different reasons, a number of strategies for addressing these issues are related. Multidimensionality refers to the existence of additional latent variables within a measure. The traditional Rasch model (and many common IRT models) assumes that there is a single latent variable that underlies the observed responses to a scale. As Reise, Morizot, and Hays (2007; also Reise, Moore, & Haviland, 2010) explain, it is common to observe the

existence of additional latent variables within a given measure, particularly when questions from this measure derive from multiple domains. If substantial multidimensionality exists within a scale, estimates from unidimensional IRT models may be biased. If the additional dimensions are identified, they can be accommodated through multilevel confirmatory latent variable IRT models that can be estimated in programs like MPLUS (Muthén & Muthén, 2011). Local item dependence arises when items within a scale share correlations beyond what is explained by the latent measure (Chen & Thissen, 1997; Yen, 1984, 1993). While multidimensionality often results in observed local item dependence; local item dependence can arise from other sources, such as common question wording and formatting among other things (Yen, 1993). Local item dependence can be addressed by eliminating item redundancies, introducing testlets that are combinations of similar items (see Steinberg & Thissen, 1996), or by correlating error terms in multilevel confirmatory latent variable IRT models.

Finally, simple Rasch and IRT models may be overly restrictive with the assumption that items perform similarly across subpopulations. A large body of psychometric literature (see Millsap, 2011) has developed to specifically address the issue of Differential Item Functioning (DIF). Despite best efforts in question selection and pretesting, it is not uncommon to observe that particular items within scales exhibit some degree of differential functioning (often in terms of item difficulty or discrimination parameters) between important subgroups of the population, usually race/ethnicity, gender, education, socioeconomic status, or other characteristics. While the focus of this research is often some form of achievement test where a particular group may be disadvantaged, examining DIF remains important for general psychometric evaluations of scales, as the existence of DIF may distort values of the latent variable(s) under investigation.

Fortunately, once identified many forms of DIF can be addressed through the introduction of covariates into Equation 3 (see Jeon, Rijmen, & Rabe-Hesketh, 2012).

While many of these issues can be accommodated through expansion of the simple IRT GHLM model used by Raudenbush and Sampson (1999a, 1999b), it remains important to examine the degree to which these adjustments are necessary. Since the conventional IRT model remains embedded within the multilevel GHLM model, psychometric examinations of *perceptions of collective efficacy* can be informative and guide further model building. Issues that arise in this lower level likely propagate across the remaining levels of the model yielding inconsistent aggregate measures of collective efficacy. For the purposes of this study, we focus on assessing the quality of measurement of perceptions of collective efficacy with the understanding that these findings will assist researchers in improving the methods and models used to measure collective efficacy at the aggregate level in the future.[4]

Expanding the Sampson et al. (1997) Scale

One of the concerns with the Sampson et al. (1997) scale is whether the items used in the scale constitute a suboptimal set of items to measure the latent variable perceptions of collective efficacy. While the measure itself has strong content validity, it remains possible that the items used to construct this measure are limited in coverage of the range of the latent variable, show low levels of measurement precision at various levels of the latent variable, or exhibit differential item functioning which may distort the measurement of the latent variable. In order to guard

[4] While it would be ideal to trace how the measurement issues identified in this report affect aggregate measures of collective efficacy, this is not possible in the current research as only a limited number of neighborhoods were examined due to limitations on available funding. For this reason, neighborhood level effects will not be considered in the current analyses and this remains an important direction for future research.

against suboptimal item selection, additional questions were added to the original Sampson et al. (1997) scale. We identified three "item domains" within the original measure. The first domain, *Willingness to Intervene* measures the respondent's perception of the willingness of neighbors to intervene when potential offensive or illegal activity occurred. This domain was identified from four of the questions from the original scale and was expanded by including an additional eight questions. The second domain, *Social Cohesion* measured the respondent's perception regarding whether other neighborhood residents shared common values and goals. This domain was identified from five of the original items in Sampson et al. (1997) and was expanded with six additional questions. The final domain, *Capacity for Social Control* measured the respondent's perception of the ability of neighborhood residents to marshal social and political capital to address a neighborhood problem. This domain was identified in a single question from the original scale (closing a fire station) and was expanded by including five additional questions. Table 4 presents the items used to construct the revised perceptions of collective efficacy scale. Individual questions will be identified in the remainder of the text according to the item domain and number presented in Table 4. In addition to expanding the number of questions in the scale, the number of response categories for each question was fixed to five.

Classic scale analysis indicated that the internal consistency is high with a Cronbach's alpha of 0.936. This is higher than the obtained Cronbach's alpha for the original Sampson et al. (1997) items of 0.837. However, it is important to note that alpha becomes inflated with a large number of items (Nunnally & Bernstein, 1994) so the relative internal consistencies of the revised scale and the original Sampson scale cannot be directly compared. The Spearman-Brown prophesy formula can be used to estimate the size of Cronbach's alpha if the scale had the same

number of items as the original Sampson et al. (1997) scale (see Nunnally & Bernstein, 1994, p. 262-263). If the revised scale was also 10 items in length and the average inter-item correlations remained the same, the Cronbach's alpha for this scale would be 0.835, nearly identical to the value for the original Sampson et al. (1997) scale. This suggests that the revised scale exhibits similar levels of internal consistency as the original scale, accounting for the differences in the number of items. While the internal consistency of the scale is large, this should not suggest that the scale itself is adequate as the alpha coefficient has numerous limitations, one of the most pertinent being that multidimensional factor structures can still exhibit high alphas (see Cortina, 1993; Reise et al., 2010).

A preliminary unidimensional IRT analysis in Winsteps (Linacre, 2012a) revealed that for five items - Willingness to Intervene item 10; Social Cohesion items 8 and 9; and Capacity for Social Control items 4 and 6 - the categorical responses did not ascend with the average latent score on collective efficacy. For the analyses that follow, these problematic categories were collapsed into the lower response category. Specifically, Social Cohesion 8 and 9 and Capacity for Social Control 4 were collapsed into three category responses. Willingness to Intervene 10 and Capacity for Social Control 6 were collapsed into four categories.

Dimensionality of the Revised Scale[5]

As previously discussed, a common assumption of many IRT models is that items comprising a scale measure a single latent variable. When multidimensional scales are forced into unidimensional IRT models, these models produce distorted item parameters (Reise, Horan, & Blanchard, 2011; Steinberg & Thissen, 1996), introduce correlations between sets of items

[5] Material in this section comes from Swatt et al. (2012a).

higher than expected based on the score on the latent variable (Steinberg & Thissen, 1996; Yen, 1984), and the resulting scale score will be a composite measure and will not accurately reflect the construct of interest (Reise et al., 2011; Steinberg & Thissen, 1996). Measures often

Table 4. Items from the Expanded Perceptions of Collective Efficacy Scale[1]

Willingness to Intervene

I am going to read a list of things that might happen in your neighborhood. After I read each one, please tell me how likely it is that one of your neighbors would do something about it.

1. If someone was trying to break into a house
2. If someone was illegally parking in the street
3. If suspicious people were hanging around the neighborhood
4. If people were having a loud argument in the street
5. If a group of underage kids were drinking
* 6. If some children were spray-painting graffiti on a local-building
* *7. If there was a fight in front of your house and someone was being beaten or threatened*
* 8. If a child was showing disrespect to an adult
* *9. If a group of neighborhood children were skipping school and hanging out on a street corner*
10. If someone on your block was playing loud music
11. If someone on your block was firing a gun
12. If drugs were being sold on your block

Social Cohesion

Now, I am going to read you some statements about your neighborhood. After I read each one, please tell me whether you Strongly Agree, Agree, Disagree, or Strongly Disagree.

1. This neighborhood is a good area to raise children
2. People that live in my neighborhood are generally friendly
3. I am happy I live in this neighborhood
4. People around here take care of each other
* *5. People in this neighborhood can be trusted*
* *6. People around here are willing to help their neighbors*
* *7. This is a close-knit neighborhood*
* 8. People in this neighborhood generally don't get along with each other (reverse coded)
* *9. People in this neighborhood do not share the same values (reverse coded)*
10. I regularly stop and talk with people in my neighborhood
11. I know the names of people in my neighborhood

Capacity for Social Control

I am going to read another list of things that might happen in your neighborhood. After I read each one, please tell me how likely it is that one of your neighbors would do something about it.

1. If there was a serious pothole on your street that needed repairs
2. People were dumping large trash items in a local park or alleys
3. A vacant house in the neighborhood was being used for drug dealing
4. The city was planning to cut funding for a local community center
5. Prostitutes were soliciting clients in your neighborhood
* *6. The city was planning on closing the fire station closest to your home*

1. Items in italics are included in the final revised scale.
* = Item was part of the original Sampson et al. (1997) scale

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violate the assumption of unidimensionality due to item heterogeneity when items representing multiple question domains are included as part of a single scale (see Reise, Morizot, & Hays, 2007 for a discussion). A number of methods are currently used for assessing unidimensionality based on results of exploratory factor analysis, confirmatory factor analysis, or non-parametric methods (see Reise et al., 2007). While these strategies offer guidelines for whether multidimensionality is a concern, researchers often find evidence supporting both unidimensionality and multidimensionality for the same scale (see Reise et al., 2010, for many examples). Instead, the *bifactor* model (Holzinger & Swineford, 1937; Schmid & Leiman, 1957; Gibbons & Hedeker, 1992) offers a systematic approach for assessing both the extent and the impact of multidimensionality (Chen et al., 2006; Reise et al., 2010).

The bifactor model posits that a single general factor is partially responsible for the observed correlations between items. In addition to this general factor, there are two or more group factors that explain additional correlations between sets of items. Figure 4 illustrates the differences between the unidimensional, multidimensional, second-order, and bifactor models (for a more general representation see Reise et al., 2010, p. 546). The "restricted" or "canonical" bifactor model applies the additional constraints that items load on at most one group factor and all factors are orthogonal (Chen et al., 2006; Gibbons & Hedeker, 1992; Reise et al., 2010). This structure offers several advantages over alternative specifications for multidimensional structures. First, all latent variables in the bifactor model remain at the same "conceptual depth," avoiding the need to discuss higher order constructs (Chen et al., 2006; Reise et al., 2010). Second, since the group factors are orthogonal to one another as well as to the general factor it becomes much easier to interpret the results from this model (see Chen et al., 2006). The general factor reflects the shared variance across all items. The group factors reflect additional variation

x

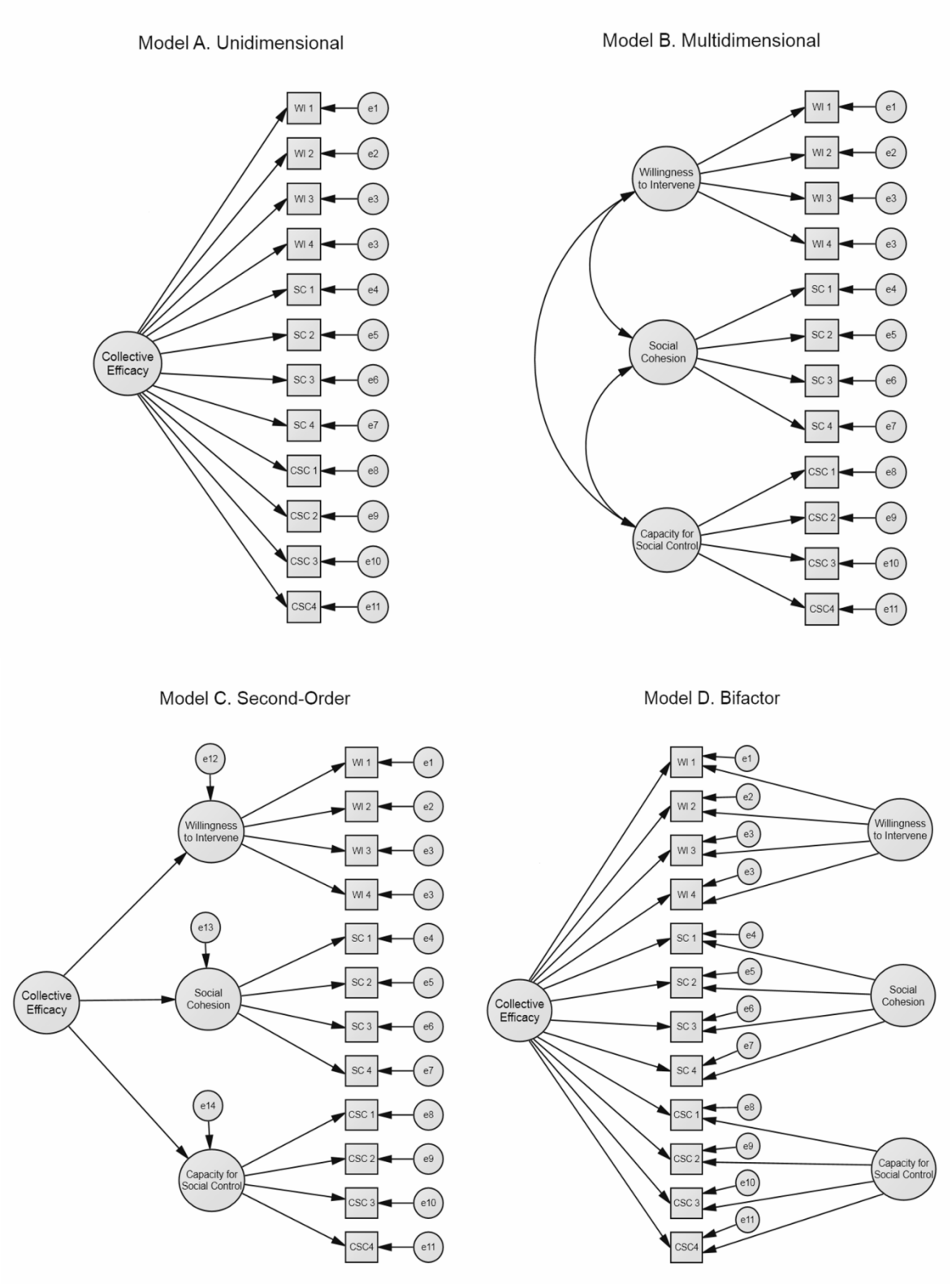


Figure 4. Illustration of the Unidimensional, Multidimensional, Second-Order, and Bifactor Models.

within item subscales after controlling for the general factor. Third, the orthogonal relationships between factors allow these factors to be scored separately and incorporated as additional explanatory variables in multivariate models (Chen et al., 2006). Finally, the unidimensional model is nested within the bifactor model, which provides a method of testing for multidimensionality through a comparison of likelihoods.[6] Factor loadings can be compared between the unidimensional and the general factor of the bifactor model to discuss the extent to which the unidimensional model is affected by multidimensionality.

The analyses described in this chapter were restricted to the 1,218 respondents from the in-person community surveys with complete information on all items in the expanded perceptions of collective efficacy scale. Both exploratory and confirmatory bifactor IRT models were used to assess the dimensionality of this scale. A polychoric correlation matrix was computed for use with exploratory factor analyses to correct for the ordinality of the response categories.[7] Principal components analysis was used to extract a single factor solution to serve as a starting point for comparisons of the factor structure of this measure. Diagnostics from the principal components analysis suggested the existence of a multidimensional structure as four components had eigenvalues greater than one and scree plots indicated multiple factors. Although commonly used, the Kaiser criterion for extracting factors with eigenvalues greater than one tends to overestimate the number of factors to extract (Velicer & Jackson, 1990).

[6] In fact, the bifactor model is a more general factor structure and both the second-order and multidimensional models are nested within this structure and emerge by imposing restrictions on the bifactor model (see Chen et al., 2006; Reise et al., 2010; Yung, Thissen, & McLeod, 1999) and it is possible to use a likelihood ratio test to compare these models (Chen et al., 2006; Yung et al., 1999).

[7] Collapsing the response categories led to numeric instability in the estimation of the polychoric correlation matrix. For this reason, exploratory analyses were conducted using the *untransformed* categories. A comparison of results for the single factor exploratory factor analyses suggests that the differences in these results are likely negligible.

Parallel analysis (Hayton, Allen, & Scarpello, 2004) corrects for this problem by comparing eigenvalues from the observed data to eigenvalues from simulated data. The parallel analysis compared observed eigenvalues to averaged eigenvalues simulated from ten replications and suggested the presence of four factors, although the final two factors were relatively small. Using this information, a principal components analysis was used to extract four factors and an oblique rotation was applied. While this method is not capable of detecting a bifactor structure, the results can be informative by revealing which items tend to cluster together. Table 5 presents the item means and standard deviations for each of the items in the scale and the results from a principal components analysis with a single factor extracted. Loadings below .2 are not displayed and loadings greater than .5 are highlighted in bold. With the exception of Capacity for Social Control 4, all items in the scale displayed very high loadings in the single factor solution.

The results of the principal components analysis was conducted with four factors and an oblique rotation are presented in the final columns of Table 5. Items from the Willingness to Intervene domain were salient on the first and third factors. In contrast, items from the Social Cohesion domain were salient on the second factor. Finally, items from the Capacity for Social Control domain were salient on the first and fourth factors. In sum, these results suggested that questions from the same domain loaded on the same factor and there was some indication of a more general factor (factor 1) as items from two domains, Willingness to Intervene and Capacity for Social Control, loaded on factor 1.

Following the preliminary exploratory factor analysis, two methods for conducting an exploratory bifactor analysis were examined: S-L orthogonalization and Partially Specified Target Matrix rotation (Reise et al., 2010). Schmid-Leiman (S-L) orthogonalization (Schmid & Lieman, 1957; Reise et al., 2010; Yung et al., 1999) involves conducting a factor analysis in two

steps, first extracting the group factors and applying an oblique rotation and then extracting a single general factor from the correlations between the oblique components. From these results, a simple transformation can be used to compute loadings (see Reise et al., 2010). While S-L orthogonalization is easy to implement, there are some important limitations to this procedure. In particular, this method imposes proportionality constraints on the final solution resulting in a solution that is mathematically equivalent to a second-order model (Chen et al., 2006; Reise et al., 2010; Yung et al., 1999). As before, a four factor solution was specified (a single general factor, and three group factors representing each question domain). The results from the S-L orthogonalization are presented first in Table 6.

These results again suggested the existence of a bifactor structure in the data. First, there was a clear indication of a general factor, perceptions of collective efficacy, which reflected shared variance among all items. All items with the exception of Willingness to Intervene 10 (.49) had loadings above .5 on this first factor. There also appeared to be non-negligible group factors corresponding to each domain and for the Willingness to Intervene and Social Cohesion items, the majority of items showed loadings in the range of .2 to .35. The final factor for the Capacity for Social Control dimension appeared to have less support as only items Capacity for Social Control 4 and 6 had loadings above .2. Comparing the loadings on the general factor to the unidimensional solution, it appeared that most of the loadings decreased by a small amount due to the presence of the additional group factors.

An alternative exploratory bifactor procedure is Partially Specified Target Matrix rotation. For this method, it is first necessary to specify a target matrix for the rotation using zeroes or unknown loadings for each item on each factor. Using both the results from the S-L

Table 5. Item Means and Standard Deviations, Single Dimension Loadings, and Exploratory Oblique Four Factor Loadings (N = 1218)

	Item Statistics			Single Factor	Four-Factor Oblique			
	# Categories	Mean	SD	Factor 1	Factor 1	Factor 2	Factor 3	Factor 4
Willingness to Intervene								
1	5	4.11	0.90	**0.71**	**0.59**		0.24	-0.22
2	5	3.53	1.04	**0.57**			**0.69**	
3	5	4.00	0.92	**0.74**	0.45		0.46	
4	5	3.87	1.00	**0.70**	0.41		**0.53**	
5	5	3.93	1.02	**0.73**	0.48		0.48	
6	5	4.03	0.92	**0.73**	0.47		0.45	
7	5	4.22	0.85	**0.74**	**0.57**		0.33	
8	5	3.56	1.03	**0.59**			**0.77**	
9	5	3.76	0.94	**0.61**			**0.77**	
10	4	3.04	0.65	**0.53**			**0.67**	
11	5	4.34	0.92	**0.74**	**0.72**			
12	5	4.28	0.96	**0.80**	**0.71**		0.23	
Social Cohesion								
1	5	3.97	0.86	**0.60**	0.26	**0.68**		
2	5	4.06	0.64	**0.65**		**0.86**		
3	5	4.09	0.81	**0.63**		**0.82**		
4	5	3.87	0.78	**0.69**		**0.90**		
5	5	3.85	0.80	**0.71**		**0.87**		
6	5	3.87	0.76	**0.71**		**0.90**		
7	5	3.67	0.84	**0.63**		**0.86**		
8	3	1.81	0.52	**0.61**		0.47		0.30
9	3	1.66	0.56	**0.60**		0.48		0.25
10	5	3.73	0.81	**0.61**		**0.74**		
11	5	3.54	0.90	**0.57**		**0.68**		
Capacity for Social Control								
1	5	4.02	0.85	**0.67**	**0.67**	0.21		
2	5	3.93	0.98	**0.69**	**0.81**			
3	5	4.11	0.98	**0.77**	**0.80**			
4	3	1.94	0.68	0.46				**0.80**
5	5	4.08	1.07	**0.75**	**0.80**			0.32
6	4	3.03	0.83	**0.55**				**0.78**

orthogonalization and information from the construction of the question domains, the target matrix was specified as a 29 x 4 matrix with all items having non-zero loadings on the first factor (the general factor), 12 items having non-zero loadings on the second factor (Willingness to Intervene), 11 items having non-zero loadings on the third factor (Social Cohesion), and 6 items having non-zero loadings on the fourth factor (Capacity for Social Control). The four factors were specified as orthogonal following the restricted bifactor model (Reise et al., 2010). This analysis was done using the Comprehensive Exploratory Factor Analysis (CEFA) program (Browne, Cudeck, Tateneni, & Mels, 2010).

Results for the partially specified target matrix rotation are presented in the final columns in Table 6. Again, there was clear evidence for a bifactor structure as items were salient on the general factor as well as on their respective group factors. While all items were salient on the general factor, in the target matrix rotation the loadings of the Social Cohesion items on the general factor were considerably lower than observed with the unidimensional solution. Further, items from this domain showed substantial loadings on the group factor. This indicated that the unidimensional factor loadings were distorted by the absence of the group factor for Social Cohesion. For most items from the other domains, the distortions were not as severe. The loadings for four of the items from Capacity for Social Control increased as the final factor appeared to be dominated by the correlation between items 4 and 6 from this domain. This suggested local item dependence remained an issue in the model.

To further examine the consequences of multidimensionality on the parameters of the perceptions of collective efficacy scale, confirmatory IRT models were conducted in IRTPRO (SSI, 2011a, 2011b). Since the response categories are ordinal, the Samejima graded response model (Samejima, 1969, 1997) was used for all confirmatory models. The results from all

models are presented in the logit metric (see SSI, 2011) and have a common format. The first columns, the λ parameters, present the factor loadings which is a transformation of the *a* parameters from each of the models. The second columns, the *a* parameters, presents the common slope of the logit curves and is often interpreted as the item discrimination parameter. The remaining columns, the *c* parameters, represent the intercepts of the logit curves. In the graded response model, there are $k - 1$ intercepts for an item with *k* response categories (Samejima, 1969, 1997). In the unidimensional model, these intercepts can be transformed and interpreted as item difficulty parameters, but this is no longer the case with multidimensional models. The first confirmatory model examined was a unidimensional IRT model and the results are presented in Table 7. This model served as a baseline for evaluating alternative specifications of the underlying latent variable structure.

Each of the items loaded strongly (above .5) in this model. Again, this suggested that the items in the scale shared a strong common factor. While the RMSEA was low (.06), there were some model fit issues. In all confirmatory models, item fit was problematic and the M_2 statistic was statistically significant (see Maydeu-Olivares & Joe 2005, 2006). Additional analyses revealed that the lack of item fit can be attributed to incongruities between the empirical item curves and the expected item curves based on the logistic distribution.[8]

[8] There were considerable departures for some items between these curves, suggesting that the logistic curve may not be an appropriate distribution to model these responses. In the future, there may be benefit in considering non-parametric item response models (see Sijtsma & Molenaar, 2002) instead of parametric IRT models. Unfortunately, these models are not as well developed as parametric IRT models. Further research is needed to examine the benefits of this type of modeling strategy in the context of ecometrics.

Table 6. Loadings from Exploratory Bifactor Principal Components Analysis

	Schmid-Leiman Orthogonalization				Target Matrix Rotation			
	General Factor	Group 1	Group 2	Group 3	General Factor	Group 1	Group 2	Group 3
Willingness to Intervene								
1	**0.66**	0.24			**0.70**			
2	**0.50**	0.34			0.45	0.45		
3	**0.69**	0.25			**0.70**	0.36		
4	**0.64**	0.31			**0.66**	0.41		
5	**0.71**	0.23			**0.72**	0.38		
6	**0.71**	0.23			**0.71**	0.36		
7	**0.73**	0.20			**0.75**	0.26		
8	**0.57**	0.30			0.48	**0.57**		
9	**0.59**	0.32			**0.51**	**0.60**		
10	0.49	0.35			0.45	0.43		
11	**0.76**				**0.81**			
12	**0.80**				**0.86**			
Social Cohesion								
1	**0.57**		0.32		**0.50**		**0.50**	
2	**0.60**		0.35		0.47		**0.68**	
3	**0.59**		0.35		0.47		**0.64**	
4	**0.64**		0.32		0.47		**0.74**	
5	**0.67**		0.29		**0.52**		**0.71**	
6	**0.66**		0.30		**0.50**		**0.74**	
7	**0.59**		0.35		0.41		**0.70**	
8	**0.63**				**0.50**		0.33	
9	**0.61**				0.49		0.34	
10	**0.57**		0.32		0.44		**0.57**	
11	**0.55**		0.31		0.43		**0.51**	
Capacity for Social Control								
1	**0.65**				**0.68**			
2	**0.71**				**0.76**			
3	**0.80**				**0.86**			
4	**0.59**			0.34	0.42			**0.64**
5	**0.81**				**0.86**			0.20
6	**0.67**			0.27	**0.53**			**0.71**

Further problems with the model were observed in diagnostics for local item dependence. Specifically, this model suffered from considerable local item dependence, as measured using the LD statistics (Chen & Thissen, 1997; SSI, 2011) with pronounced clusters of local item dependence occurring within item domains. This result was not surprising as the presence of clusters of local item dependence is expected when a multidimensional scale is forced into a unidimensional model.

The second confirmatory model was a multidimensional IRT model. The results for this model are presented in Table 8. Separate latent variables were specified to correspond to each separate item domain (Willingness to Intervene, Social Cohesion, and Capacity of Social Control) and were allowed to correlate freely. The multidimensional model fit the data better than the unidimensional model as the RMSEA decreased to 0.05 which indicates acceptable fit.[9] The AIC and BIC confirmed that the multidimensional model is preferred over the unidimensional model. All items loaded strongly on their respective domains. The correlation between factor 1 (Willingness to Intervene) and factor 3 (Capacity for Social Control) was substantial at .83. Correlations between factor 1 and factor 2 (Social Cohesion) and factor 2 and factor 3 were less strong at .53 and .56 respectively.

The first bifactor IRT model is presented in Table 9. Again, the fit of the model was acceptable with a RMSEA of .05.[10] A likelihood ratio test for the more general bifactor model

[9] The M_2 statistic was still significant for this model, suggesting some remaining problems with model fit.

[10] Again, the M_2 statistic was statistically significant, but the ratio of the statistic to the degrees of freedom was lower than the multidimensional model suggesting some improvement in fit.

Table 7. Parameter Estimates from Confirmatory Unidimensional Graded Response Model

	Loading	Model Parameters				
	λ_1	a	c_1	c_2	c_3	c_4
Willingness to Intervene						
1	0.76 (0.03)	1.97 (0.11)	5.53 (0.26)	3.62 (0.16)	2.79 (0.13)	-0.95 (0.09)
2	0.58 (0.04)	1.22 (0.07)	4.29 (0.20)	1.67 (0.09)	0.58 (0.07)	-2.08 (0.10)
3	0.79 (0.03)	2.17 (0.11)	5.93 (0.28)	3.50 (0.15)	2.48 (0.13)	-1.35 (0.10)
4	0.75 (0.03)	1.90 (0.10)	5.29 (0.24)	2.77 (0.13)	1.81 (0.10)	-1.49 (0.10)
5	0.79 (0.03)	2.19 (0.11)	5.14 (0.22)	3.14 (0.14)	2.26 (0.12)	-1.39 (0.11)
6	0.79 (0.03)	2.20 (0.12)	5.66 (0.26)	3.61 (0.16)	2.75 (0.14)	-1.40 (0.11)
7	0.80 (0.03)	2.28 (0.12)	6.51 (0.33)	4.31 (0.19)	3.23 (0.15)	-0.58 (0.10)
8	0.62 (0.04)	1.34 (0.08)	4.13 (0.18)	1.95 (0.10)	0.60 (0.08)	-2.11 (0.10)
9	0.66 (0.04)	1.49 (0.08)	4.83 (0.23)	2.49 (0.11)	1.41 (0.09)	-2.09 (0.10)
10	0.64 (0.04)	1.40 (0.09)	4.62 (0.22)	2.28 (0.11)	-1.75 (0.10)	--
11	0.82 (0.03)	2.48 (0.14)	6.08 (0.29)	4.27 (0.20)	3.68 (0.18)	0.40 (0.10)
12	0.87 (0.02)	3.01 (0.17)	6.78 (0.33)	4.77 (0.23)	3.83 (0.20)	0.23 (0.12)
Social Cohesion						
1	0.60 (0.04)	1.28 (0.08)	4.76 (0.24)	2.97 (0.13)	1.97 (0.10)	-1.47 (0.09)
2	0.66 (0.04)	1.49 (0.09)	7.37 (0.70)	4.53 (0.21)	2.58 (0.12)	-1.79 (0.10)
3	0.63 (0.04)	1.37 (0.09)	5.22 (0.28)	3.29 (0.14)	2.47 (0.11)	-1.20 (0.08)
4	0.69 (0.04)	1.61 (0.09)	6.24 (0.39)	3.56 (0.15)	1.68 (0.10)	-2.22 (0.11)
5	0.71 (0.03)	1.70 (0.10)	5.76 (0.31)	3.60 (0.15)	1.70 (0.10)	-2.29 (0.11)
6	0.71 (0.03)	1.71 (0.10)	5.93 (0.33)	3.74 (0.16)	1.90 (0.11)	-2.45 (0.12)
7	0.61 (0.04)	1.32 (0.08)	5.36 (0.30)	2.82 (0.12)	0.83 (0.08)	-2.40 (0.11)
8	0.68 (0.04)	1.59 (0.10)	1.55 (0.10)	-3.89 (0.18)	--	--
9	0.67 (0.04)	1.52 (0.10)	0.71 (0.08)	-4.14 (0.19)	--	--
10	0.59 (0.04)	1.23 (0.08)	5.10 (0.28)	2.76 (0.12)	1.26 (0.08)	-2.57 (0.11)
11	0.55 (0.04)	1.13 (0.07)	4.37 (0.21)	2.13 (0.10)	0.62 (0.07)	-2.81 (0.12)
Capacity for Social Control						
1	0.71 (0.03)	1.70 (0.10)	5.58 (0.29)	3.39 (0.15)	2.38 (0.12)	-1.39 (0.09)
2	0.75 (0.03)	1.90 (0.10)	5.56 (0.27)	2.85 (0.13)	2.16 (0.11)	-1.38 (0.10)
3	0.83 (0.02)	2.52 (0.13)	6.07 (0.28)	3.85 (0.18)	3.02 (0.15)	-0.65 (0.10)
4	0.50 (0.05)	0.99 (0.07)	1.23 (0.08)	-1.56 (0.08)	--	--
5	0.80 (0.03)	2.26 (0.12)	4.65 (0.20)	3.46 (0.16)	2.83 (0.14)	-0.59 (0.10)
6	0.58 (0.04)	1.20 (0.08)	3.15 (0.13)	1.78 (0.09)	-1.11 (0.08)	--
Model Information						
-2 Log Likelihood	65829.74					
AIC	66103.74					
BIC	66803.12					
M_2 (df)	1561.35 (298)					
RMSEA	0.06					

compared to the unidimensional model was statistically significant (χ^2 = 5385.76, *df* = 29, *p* < .001) indicating that the bifactor model is preferred over the unidimensional model.[11] The AIC and BIC confirmed that the bifactor model is preferred over both the unidimensional and multidimensional models.

By comparing the loadings from the unidimensional model to the bifactor model, it was possible to gauge the extent to which ignoring multidimensionality affected the parameter estimates from the unidimensional model. For the Willingness to Intervene items, the degree of bias appeared relatively small. Items Willingness to Intervene 8 and 9 had the largest bias with a difference in loadings of .16 and .15 respectively, suggesting some slight overestimation in the association of these items with Perceptions of Collective Efficacy. The degree of bias for the Social Cohesion items was much higher, with five items (2, 4, 5, 6, and 7) having loadings that differ by over .2. Further, nine of the eleven items had higher loadings on the Social Cohesion group factor compared to the Perceptions of Collective Efficacy general factor. This illustrates that when ignoring multidimensionality for this subset of items, the contribution of Social Cohesion items to the scale was overstated. For the Capacity for Social Control items, the differences in loadings appeared negligible.

[11] This likelihood ratio test is simply the difference of the two -2 log likelihoods with degrees of freedom equal to the difference in the number of free parameters (166 vs. 137).

Table 8. Parameter Estimates from Confirmatory Multidimensional Graded Response Model

	Loadings			Model Parameters						
	λ_1	λ_2	λ_3	a_1	a_2	a_3	c_1	c_2	c_3	c_4
Willingness to Intervene										
1	0.75 (0.03)	--	--	1.93 (0.10)	--	--	5.56 (0.27)	3.59 (0.16)	2.75 (0.13)	-0.95 (0.09)
2	0.61 (0.04)	--	--	1.33 (0.08)	--	--	4.42 (0.20)	1.70 (0.09)	0.59 (0.07)	-2.14 (0.10)
3	0.81 (0.02)	--	--	2.38 (0.12)	--	--	6.36 (0.31)	3.73 (0.17)	2.62 (0.13)	-1.42 (0.11)
4	0.79 (0.03)	--	--	2.20 (0.11)	--	--	5.77 (0.27)	3.01 (0.14)	1.96 (0.11)	-1.61 (0.11)
5	0.85 (0.02)	--	--	2.80 (0.14)	--	--	6.11 (0.28)	3.68 (0.17)	2.64 (0.14)	-1.62 (0.12)
6	0.85 (0.02)	--	--	2.76 (0.14)	--	--	6.67 (0.32)	4.19 (0.20)	3.16 (0.16)	-1.60 (0.12)
7	0.84 (0.02)	--	--	2.61 (0.14)	--	--	7.26 (0.38)	4.71 (0.21)	3.50 (0.17)	-0.63 (0.10)
8	0.68 (0.03)	--	--	1.57 (0.08)	--	--	4.41 (0.19)	2.08 (0.10)	0.65 (0.08)	-2.25 (0.11)
9	0.74 (0.03)	--	--	1.86 (0.10)	--	--	5.35 (0.25)	2.76 (0.13)	1.56 (0.10)	-2.32 (0.12)
10	0.69 (0.04)	--	--	1.61 (0.09)	--	--	4.91 (0.23)	2.43 (0.12)	-1.85 (0.10)	--
11	0.86 (0.02)	--	--	2.92 (0.17)	--	--	7.00 (0.35)	4.82 (0.24)	4.10 (0.21)	0.44 (0.11)
12	0.90 (0.02)	--	--	3.51 (0.20)	--	--	7.82 (0.40)	5.43 (0.28)	4.27 (0.23)	0.25 (0.13)
Social Cohesion										
1	--	0.74 (0.03)	--	--	1.88 (0.10)	--	5.53 (0.27)	3.50 (0.15)	2.33 (0.12)	-1.73 (0.10)
2	--	0.86 (0.02)	--	--	2.88 (0.16)	--	10.20 (0.95)	6.28 (0.30)	3.75 (0.19)	-2.55 (0.15)
3	--	0.83 (0.02)	--	--	2.52 (0.14)	--	6.91 (0.37)	4.50 (0.21)	3.42 (0.17)	-1.57 (0.11)
4	--	0.91 (0.01)	--	--	3.67 (0.20)	--	9.87 (0.59)	5.96 (0.29)	2.88 (0.18)	-3.74 (0.21)
5	--	0.91 (0.02)	--	--	3.62 (0.20)	--	9.01 (0.49)	5.87 (0.29)	2.80 (0.18)	-3.75 (0.21)
6	--	0.92 (0.01)	--	--	3.98 (0.23)	--	9.84 (0.56)	6.52 (0.34)	3.32 (0.21)	-4.36 (0.25)
7	--	0.83 (0.02)	--	--	2.57 (0.13)	--	7.17 (0.38)	3.96 (0.18)	1.20 (0.11)	-3.48 (0.17)
8	--	0.69 (0.04)	--	--	1.60 (0.10)	--	1.56 (0.10)	-3.89 (0.18)	--	--
9	--	0.66 (0.004)	--	--	1.50 (0.10)	--	0.72 (0.08)	-4.13 (0.19)	--	--
10	--	0.74 (0.03)	--	--	1.89 (0.10)	--	5.96 (0.31)	3.28 (0.14)	1.50 (0.10)	-3.13 (0.15)
11	--	0.70 (0.03)	--	--	1.68 (0.09)	--	5.00 (0.23)	2.48 (0.11)	0.75 (0.08)	-3.32 (0.15)
Capacity for Social Control										
1	--	--	0.74 (0.03)	--	--	1.85 (0.10)	5.75 (0.29)	3.50 (0.15)	2.47 (0.12)	-1.47 (0.10)
2	--	--	0.82 (0.02)	--	--	2.43 (0.13)	6.40 (0.31)	3.30 (0.16)	2.49 (0.14)	-1.62 (0.11)
3	--	--	0.91 (0.02)	--	--	3.79 (0.23)	8.28 (0.45)	5.25 (0.29)	4.08 (0.24)	-0.90 (0.14)
4	--	--	0.57 (0.04)	--	--	1.19 (0.08)	1.31 (0.08)	-1.64 (0.09)	--	--
5	--	--	0.89 (0.02)	--	--	3.39 (0.20)	6.23 (0.32)	4.60 (0.24)	3.72 (0.21)	-0.77 (0.13)
6	--	--	0.64 (0.04)	--	--	1.41 (0.09)	3.35 (0.14)	1.89 (0.10)	-1.19 (0.08)	--

Model Information	
Corr(θ_1, θ_2)	0.53 (0.02)
Corr(θ_1, θ_3)	0.83 (0.01)
Corr(θ_2, θ_3)	0.56 (0.02)
-2 Log Likelihood	61530.19
AIC	61810.19
BIC	62524.89
M_2 (df)	1263.28 (295)
RMSEA	0.05

Table 9. Parameter Estimates from Confirmatory Bifactor Graded Response Model

	Loadings				Model Parameters							
	λ_1	λ_2	λ_3	λ_4	a_1	a_2	a_3	a_4	c_1	c_2	c_3	c_4
Willingness to Intervene												
1	0.72 (0.03)	0.23 (0.06)	--	--	1.86 (0.10)	0.61 (0.09)	--	--	5.54 (0.26)	3.60 (0.16)	2.78 (0.14)	-0.95 (0.10)
2	0.45 (0.05)	0.48 (0.05)	--	--	1.03 (0.08)	1.10 (0.09)	--	--	4.65 (0.22)	1.79 (0.10)	0.62 (0.08)	-2.25 (0.11)
3	0.70 (0.03)	0.42 (0.05)	--	--	2.06 (0.11)	1.24 (0.11)	--	--	6.43 (0.32)	3.76 (0.17)	2.63 (0.14)	-1.44 (0.12)
4	0.65 (0.04)	0.47 (0.05)	--	--	1.86 (0.11)	1.34 (0.11)	--	--	5.94 (0.28)	3.07 (0.15)	1.99 (0.12)	-1.65 (0.12)
5	0.71 (0.03)	0.49 (0.05)	--	--	2.38 (0.13)	1.62 (0.13)	--	--	6.26 (0.30)	3.75 (0.19)	2.67 (0.16)	-1.64 (0.13)
6	0.71 (0.03)	0.45 (0.05)	--	--	2.24 (0.13)	1.43 (0.12)	--	--	6.52 (0.32)	4.08 (0.20)	3.06 (0.16)	-1.56 (0.13)
7	0.77 (0.03)	0.31 (0.05)	--	--	2.34 (0.13)	0.95 (0.10)	--	--	7.04 (0.36)	4.59 (0.21)	3.41 (0.17)	-0.62 (0.11)
8	0.46 (0.05)	0.61 (0.05)	--	--	1.23 (0.09)	1.61 (0.12)	--	--	5.01 (0.25)	2.39 (0.13)	0.75 (0.10)	-2.58 (0.13)
9	0.51 (0.05)	0.64 (0.05)	--	--	1.50 (0.11)	1.87 (0.14)	--	--	6.20 (0.34)	3.21 (0.18)	1.81 (0.13)	-2.70 (0.15)
10	0.54 (0.05)	0.47 (0.06)	--	--	1.31 (0.09)	1.15 (0.10)	--	--	5.11 (0.25)	2.51 (0.13)	-1.93 (0.11)	--
11	0.86 (0.03)	0.17 (0.06)	--	--	3.03 (0.18)	0.60 (0.12)	--	--	7.12 (0.36)	5.00 (0.26)	4.28 (0.23)	0.52 (0.13)
12	0.89 (0.02)	0.20 (0.05)	--	--	3.71 (0.22)	0.82 (0.13)	--	--	8.20 (0.43)	5.75 (0.31)	4.53 (0.26)	0.34 (0.15)
Social Cohesion												
1	0.49 (0.05)	--	0.56 (0.04)	--	1.25 (0.09)	--	1.43 (0.09)	--	5.54 (0.27)	3.51 (0.15)	2.34 (0.12)	-1.73 (0.11)
2	0.45 (0.05)	--	0.74 (0.04)	--	1.52 (0.13)	--	2.50 (0.16)	--	10.34 (0.98)	6.34 (0.32)	3.80 (0.21)	-2.58 (0.16)
3	0.47 (0.05)	--	0.69 (0.04)	--	1.43 (0.11)	--	2.09 (0.13)	--	6.92 (0.37)	4.51 (0.21)	3.43 (0.18)	-1.56 (0.12)
4	0.46 (0.05)	--	0.79 (0.03)	--	1.92 (0.15)	--	3.29 (0.21)	--	10.13 (0.63)	6.14 (0.33)	2.97 (0.21)	-3.84 (0.23)
5	0.51 (0.05)	--	0.75 (0.03)	--	2.03 (0.15)	--	3.03 (0.19)	--	9.05 (0.51)	5.89 (0.31)	2.81 (0.20)	-3.77 (0.21)
6	0.48 (0.05)	--	0.79 (0.03)	--	2.14 (0.17)	--	3.49 (0.24)	--	10.08 (0.62)	6.68 (0.40)	3.40 (0.26)	-4.46 (0.26)
7	0.41 (0.05)	--	0.74 (0.03)	--	1.28 (0.11)	--	2.32 (0.13)	--	7.31 (0.40)	4.06 (0.20)	1.23 (0.13)	-3.56 (0.17)
8	0.59 (0.05)	--	0.40 (0.05)	--	1.45 (0.10)	--	0.97 (0.09)	--	1.63 (0.11)	-4.10 (0.20)	--	--
9	0.61 (0.04)	--	0.36 (0.05)	--	1.45 (0.10)	--	0.87 (0.09)	--	0.78 (0.09)	-4.41 (0.21)	--	--
10	0.44 (0.05)	--	0.60 (0.04)	--	1.12 (0.09)	--	1.51 (0.10)	--	5.94 (0.32)	3.27 (0.15)	1.50 (0.11)	-3.14 (0.15)
11	0.44 (0.05)	--	0.55 (0.04)	--	1.06 (0.08)	--	1.30 (0.09)	--	4.98 (0.24)	2.48 (0.12)	0.75 (0.09)	-3.33 (0.15)
Capacity for Social Control												
1	0.74 (0.03)	--	--	-0.07 (0.05)	1.87 (0.11)	--	--	-0.18 (0.08)	5.69 (0.29)	3.51 (0.16)	2.50 (0.13)	-1.48 (0.11)
2	0.81 (0.03)	--	--	-0.03 (0.05)	2.37 (0.13)	--	--	-0.10 (0.09)	6.15 (0.30)	3.23 (0.16)	2.48 (0.14)	-1.60 (0.12)
3	0.90 (0.02)	--	--	0.03 (0.05)	3.45 (0.21)	--	--	0.10 (0.10)	7.52 (0.40)	4.84 (0.27)	3.81 (0.23)	-0.78 (0.15)
4	0.45 (0.05)	--	--	0.73 (0.04)	1.48 (0.12)	--	--	2.40 (0.15)	2.08 (0.18)	-2.58 (0.18)	--	--
5	0.87 (0.02)	--	--	0.16 (0.05)	3.22 (0.18)	--	--	0.59 (0.10)	6.08 (0.30)	4.49 (0.24)	3.64 (0.21)	-0.74 (0.15)
6	0.52 (0.04)	--	--	0.85 (0.03)	14.99 (0.93)	--	--	24.73 (0.97)	43.112 (1.45)	24.73 (1.35)	-14.74 (1.65)	--
Model Information												
-2 Log Likelihood	60443.98											
AIC	60775.98											
BIC	61623.40											
M_2 (df)	989.05 (269)											
RMSEA	0.05											

One important caveat to these results is the comparatively high parameter estimates for Capacity for Social Control item 6. Further inspection of this model indicated that this item was severely affected by local item dependence with Capacity for Social Control item 4. Further, the relatively high loadings of these items on the group factor suggested that this local item dependence was substantially affecting loadings on this factor. In order to assess the degree to which was the case, two items, Capacity for Social Control item 6 and Social Cohesion item 9, were deleted from the model.[12] The results for this revised model are displayed in Table 10. While local item dependence remained an issue, subsequent deletions decreased model fit. Based on the AIC, BIC, and RMSEA the revised model appeared to fit the data better than the original bifactor model. The results for the Willingness to Intervene and Social Cohesion subdomains appeared highly consistent with the original bifactor solution and only small changes in the loadings were observed. For the Capacity for Social Control items, however, there were some changes in the loadings for the general factor, the largest of which was a decrease of .11 in the loadings for Capacity for Social Control item 2. The main differences between these models involved the loadings for Capacity for Social Control items on the group factor. All remaining items from this subdomain became salient on this factor, suggesting that the original solution was distorted by the local item dependence between items 4 and 6. However, since the decrease in the loadings between this model and the unidimensional model remained small and the loadings for the Capacity for Social Control items was smaller on the group factor compared to

[12] The selection of one of the item pairs to delete from the model was arbitrary since the purpose of this model is to assess the degree to which local item dependence affected the loadings from the bifactor model. Other considerations (such as differential item functioning considered later) may lead to different conclusions about which item from the locally dependent pairs should remain in the final scale.

Table 10. Parameter Estimates from Revised Confirmatory Bifactor Graded Response Model

	Loadings				Model Parameters							
	λ_1	λ_2	λ_3	λ_4	a_1	a_2	a_3	a_4	c_1	c_2	c_3	c_4
Willingness to Intervene												
1	0.74 (0.03)	0.12 (0.07)	--	--	1.93 (0.11)	0.32 (0.10)	--	--	5.55 (0.27)	3.60 (0.16)	2.77 (0.14)	-0.96 (0.10)
2	0.51 (0.05)	0.45 (0.06)	--	--	1.20 (0.09)	1.06 (0.10)	--	--	4.78 (0.23)	1.84 (0.10)	0.63 (0.09)	-2.32 (0.13)
3	0.76 (0.03)	0.31 (0.06)	--	--	2.24 (0.13)	0.93 (0.12)	--	--	6.49 (0.32)	3.78 (0.18)	2.64 (0.15)	-1.45 (0.13)
4	0.73 (0.04)	0.35 (0.06)	--	--	2.07 (0.12)	1.00 (0.12)	--	--	5.98 (0.29)	3.09 (0.15)	1.99 (0.13)	-1.66 (0.12)
5	0.79 (0.03)	0.34 (0.07)	--	--	2.60 (0.14)	1.11 (0.14)	--	--	6.19 (0.30)	3.71 (0.19)	2.65 (0.17)	-1.63 (0.14)
6	0.79 (0.03)	0.28 (0.07)	--	--	2.49 (0.14)	0.87 (0.14)	--	--	6.48 (0.32)	4.07 (0.20)	3.06 (0.17)	-1.57 (0.13)
7	0.83 (0.03)	0.12 (0.07)	--	--	2.55 (0.14)	0.38 (0.13)	--	--	7.12 (0.37)	4.67 (0.22)	3.48 (0.18)	-0.628 (0.12)
8	0.55 (0.06)	0.55 (0.08)	--	--	1.48 (0.11)	1.48 (0.17)	--	--	5.12 (0.29)	2.44 (0.16)	0.75 (0.11)	-2.64 (0.15)
9	0.60 (0.05)	0.55 (0.08)	--	--	1.79 (0.12)	1.63 (0.19)	--	--	6.25 (0.37)	3.24 (0.20)	1.81 (0.15)	-2.72 (0.16)
10	0.61 (0.05)	0.38 (0.08)	--	--	1.48 (0.10)	0.91 (0.13)	--	--	5.11 (0.26)	2.51 (0.14)	-1.92 (0.11)	--
11	0.92 (0.02)	-0.13 (0.08)	--	--	4.28 (0.33)	-0.60 (0.25)	--	--	9.13 (0.59)	6.54 (0.43)	5.66 (0.38)	0.77 (0.18)
12	0.95 (0.01)	-0.07 (0.07)	--	--	5.02 (0.37)	-0.35 (0.24)	--	--	10.27 (0.69)	7.32 (0.48)	5.82 (0.40)	0.50 (0.20)
Social Cohesion												
1	0.46 (0.05)	--	0.59 (0.04)	--	1.16 (0.10)	--	1.50 (0.10)	--	5.54 (0.27)	3.49 (0.15)	2.34 (0.12)	-1.72 (0.11)
2	0.44 (0.05)	--	0.75 (0.03)	--	1.50 (0.13)	--	2.55 (0.16)	--	10.43 (0.99)	6.38 (0.32)	3.81 (0.21)	-2.59 (0.16)
3	0.44 (0.05)	--	0.70 (0.04)	--	1.35 (0.12)	--	2.15 (0.13)	--	6.95 (0.38)	4.51 (0.22)	3.43 (0.18)	-1.56 (0.12)
4	0.45 (0.05)	--	0.79 (0.03)	--	1.90 (0.16)	--	3.32 (0.20)	--	10.18 (0.63)	6.15 (0.33)	2.98 (0.21)	-3.85 (0.23)
5	0.49 (0.05)	--	0.76 (0.03)	--	1.95 (0.15)	--	3.06 (0.18)	--	9.04 (0.51)	5.85 (0.31)	2.79 (0.20)	-3.75 (0.21)
6	0.47 (0.05)	--	0.79 (0.03)	--	2.09 (0.17)	--	3.50 (0.23)	--	10.06 (0.61)	6.64 (0.39)	3.38 (0.25)	-4.44 (0.26)
7	0.40 (0.05)	--	0.74 (0.03)	--	1.26 (0.11)	--	2.32 (0.13)	--	7.30 (0.40)	4.04 (0.20)	1.23 (0.13)	-3.55 (0.17)
8	0.58 (0.05)	--	0.39 (0.05)	--	1.37 (0.10)	--	0.93 (0.09)	--	1.59 (0.11)	-3.98 (0.19)	--	--
10	0.42 (0.05)	--	0.62 (0.04)	--	1.07 (0.09)	--	1.57 (0.10)	--	5.97 (0.32)	3.29 (0.15)	1.51 (0.11)	-3.15 (0.15)
11	0.42 (0.05)	--	0.57 (0.04)	--	1.00 (0.09)	--	1.35 (0.09)	--	4.98 (0.24)	2.48 (0.12)	0.75 (0.09)	-3.33 (0.15)
Capacity for Social Control												
1	0.65 (0.04)	--	--	0.37 (0.06)	1.68 (0.10)	--	--	0.95 (0.11)	5.79 (0.30)	3.55 (0.16)	2.52 (0.13)	-1.51 (0.11)
2	0.70 (0.04)	--	--	0.48 (0.06)	2.27 (0.14)	--	--	1.53 (0.15)	6.79 (0.37)	3.55 (0.19)	2.71 (0.17)	-1.77 (0.14)
3	0.81 (0.03)	--	--	0.46 (0.06)	3.65 (0.28)	--	--	2.09 (0.26)	8.83 (0.60)	5.64 (0.38)	4.42 (0.31)	-0.87 (0.18)
4	0.44 (0.05)	--	--	0.20 (0.08)	0.85 (0.07)	--	--	0.39 (0.09)	1.21 (0.08)	-1.54 (0.08)	--	--
5	0.79 (0.03)	--	--	0.40 (0.05)	2.88 (0.18)	--	--	1.44 (0.15)	5.88 (0.30)	4.37 (0.23)	3.55 (0.21)	-0.67 (0.14)

Model Information	
-2 Log Likelihood	56960.09
AIC	57274.09
BIC	58075.57
M_2 (df)	682.72 (221)
RMSEA	0.04

the general factor; it still appeared that there is little consequence for ignoring the multidimensional nature of this set of items.

Item Selection and Scoring Perceptions of Collective Efficacy and Social Cohesion[13]

The previous results offer a starting point for specifying the factor structure of the perceptions of collective efficacy scale. Noting the benefits offered by the bifactor IRT model for addressing the inherent multidimensionality, this model will be used as the starting point for developing the final scale. Previous models did not attempt to optimize the selection of items for inclusion in the finalized scale. Seeing that the current scale consists of 29 items, a shorter version of the scale would be beneficial to reduce the time burden on respondents. IRT offers a number of strategies that will be helpful at identifying the best performing items in the scale. For the following analyses, 1,210 cases were examined with non-missing data on the perceptions of collective efficacy items, gender, and race/ethnicity.

Analyses

Unidimensional IRT models conducted in WinSteps (Linacre, 2012a) were used to aid model specification. Particularly, the unidimensional IRT models provided a method to detect disordered categories and assess differential item functioning (DIF) across gender and race/ethnicity groups (White/Other, Hispanic/Latino, Black). While previous studies have found that multidimensionality can substantially affect the detection of DIF (see Yang, Tommel, & Jones, 2009), the purpose of this preliminary analysis is simply to identify items that likely contain a problematic bias and eliminate them from the scale. When evaluating DIF it is necessary that contrasts between groups are statistically significant as well as substantively

[13] Material in this section comes from Swatt et al. (2012b).

important (Linacre, 2012b; Zwick, Thayer, & Lewis, 1999). A contrast of 0.43 in the logit metric can be interpreted as slight to moderate DIF (listed in bold) and 0.64 as moderate to high DIF (listed in bold and italicized).

The DIF results for gender are presented in Table 11. The first column represents a Chi-square test against the null hypothesis that the item shows no differential item functioning across all groups. The second set of columns report the size of the contrasts and the p-values associated with the Mantel-Haenszel statistics. Moderate DIF effects are presented in bold and high DIF effects are presented in bold and italics. These results indicated that there were no sizable DIF effects for gender for any of the response categories. This suggests that items in the perception of collective efficacy scale perform similarly between males and females.

Sizable effects, however, were observed for race/ethnicity and are reported in Table 12. Given the demographics of the sample, respondents were divided into three categories: White/Other, Hispanic, and Black. There were slight to moderate DIF for many of the items in the scale, particularly the items within the perceptions of social cohesion domain. For four of the items in the scale – Willingness to Intervene 10, Social Cohesion 3 and 11, and Capacity for Social Control 4 – the DIF effects were sizable. Hispanic respondents were less likely to endorse that their neighbors would be likely to intervene if someone on the block was playing loud music. Black respondents were more likely to endorse that they are happy to live in the neighborhood, but were less likely to endorse that they know the names of people in their

Table 11. Unidimensional IRT Differential Item Functioning by Gender.

Item	Chi-Square	Male v Female Contrast	*p*
Willingness to Intervene			
1	0.759	0.07	0.642
2	0.000	0.00	0.369
3	0.145	-0.02	0.736
4	0.000	0.00	0.476
5	0.934	0.07	0.161
6	0.000	0.00	0.777
7	0.000	0.00	0.986
8	0.000	0.00	0.664
9	1.838	0.11	0.113
10	2.013	-0.15	0.209
11	3.358	0.15	0.040
12	1.943	0.11	0.165
Social Cohesion			
1	2.798	-0.15	0.056
2	0.367	-0.07	0.365
3	1.997	-0.13	0.147
4	2.116	-0.14	0.191
5	0.462	-0.06	0.694
6	1.371	-0.11	0.227
7	1.390	-0.10	0.181
8	1.076	-0.13	0.372
9	0.000	0.00	0.887
10	3.340	-0.17	0.049
11	0.000	0.00	0.989
Capacity for Social Control			
1	0.000	0.00	0.797
2	1.936	0.16	0.098
3	2.249	0.12	0.042
4	0.000	0.00	0.764
5	3.165	0.13	0.008
6	0.140	0.03	0.688

Table 12. Unidimensional IRT Differential Item Functioning by Race.

Item	Chi-Square	Other v Hispanic Contrast	*p*	Other v Black Contrast	*p*	Hispanic v Black Contrast	*p*
Willingness to Intervene							
1	8.338*	-0.28	0.008	-0.07	0.494	0.21	0.014
2	19.073*	0.17	0.608	-0.22	0.028	-0.39	0.000
3	2.009	-0.04	0.369	0.11	0.024	0.14	0.292
4	4.033	-0.13	0.538	-0.24	0.060	-0.11	0.519
5	1.333	0.08	0.104	0.13	0.048	0.05	0.801
6	5.878	0.09	0.142	0.29	0.000	0.20	0.003
7	1.773	-0.13	0.890	-0.02	0.670	0.11	0.098
8	36.436***	**0.53**	0.000	0.14	0.514	-0.39	0.000
9	26.074***	0.22	0.115	**0.63**	0.000	0.41	0.001
10	39.398***	**0.56**	0.000	-0.17	0.034	***-0.74***	0.000
11	7.877*	-0.29	0.421	-0.12	0.653	0.18	0.136
12	6.391*	-0.17	0.937	0.05	0.122	0.22	0.017
Social Cohesion							
1	22.612***	-0.23	0.012	**-0.60**	0.000	-0.37	0.004
2	7.141*	-0.10	0.276	-0.40	0.220	-0.30	0.073
3	36.761***	-0.31	0.006	***-0.81***	0.000	**-0.49**	0.000
4	10.576**	0.18	0.957	-0.17	0.802	-0.35	0.017
5	20.952***	-0.13	0.016	**-0.56**	0.000	**-0.43**	0.000
6	10.986**	**-0.44**	0.000	-0.34	0.260	0.10	0.370
7	13.059**	0.13	0.945	**0.46**	0.000	0.33	0.013
8	13.124**	-0.04	0.544	**-0.58**	0.000	**-0.53**	0.000
9	1.323	-0.18	0.342	-0.13	0.017	0.05	0.451
10	14.723***	0.34	0.112	**0.52**	0.001	0.18	0.045
11	47.338***	-0.15	0.027	**0.61**	0.000	***0.76***	0.000
Capacity for Social Control							
1	16.213***	0.13	0.221	-0.28	0.002	-0.41	0.001
2	3.266	-0.19	0.377	-0.16	0.279	0.04	0.565
3	5.931	-0.26	0.162	-0.17	0.834	0.10	0.216
4	61.539***	**0.50**	0.005	***1.26***	0.000	***0.76***	0.000
5	11.291**	-0.28	0.176	-0.05	0.668	0.23	0.031
6	12.379**	0.33	0.020	**0.46**	0.020	0.13	0.818

* $p < .05$, ** $p < .01$, *** $p < .001$

neighborhoods. Finally, Black respondents were more likely than Hispanic respondents who were more likely than White/Other respondents to indicate that one of their neighbors would do something if the city was planning to cut funding for a local community center. An examination of the item characteristic curves for a unidimensional model suggested that these items contributed very little information to the scale. While it is possible that these items contribute information for the group factors in the bifactor model, given the substantial DIF for race/ethnicity and the low information content from the unidimensional models would indicate a preference for item deletion, and as such, these items were dropped from the scale.

Following the elimination of these four items, a preliminary bifactor IRT model was examined. Results for this model are presented in Table 13. While the M_2 statistic (see Maydeu-Olivares & Joe, 2005, 2006; SSI, 2011b) was statistically significant, the model RMSEA was .06 and indicated adequate fit. The $S\text{-}X^2$ statistics for item fit (see Orlando & Thissen, 2000, 2003; SSI, 2011b) were significant for all items, suggesting problematic item fit to the response model. Inspection of the empirical item response curves from a unidimensional IRT models suggested that the lack of fit was due to discrepancies between the empirical item curves and the expected item curves under the logistic item response model.

Results mirrored those discussed in Table 9 earlier. Items from the Willingness to Intervene dimension had substantial loadings on the general factor and smaller loadings on the group factor. While seven of the twelve items were salient on the group factor, the difference in the size of the loadings between these factors suggested that most of the correlation between items in this domain could be explained by the general factor. Items from the Capacity for Social Control domain showed similar results. Although four of the five items were salient on the group domain, the loadings for all items were higher on the general domain. For the Social Cohesion

Table 13. Initial Results from the Bifactor IRT model with Deleted DIF Items.

	Loadings				Model Parameters							
Item	λ_1	λ_2	λ_3	λ_4	a_1	a_2	a_3	a_4	c_1	c_2	c_3	c_4
Willingness to Intervene												
1	0.74 (0.03)	0.18 (0.06)	--	--	1.92 (0.11)	0.48 (0.10)	--	--	5.61 (0.27)	3.63 (0.16)	2.79 (0.14)	-0.96 (0.10)
2	0.52 (0.05)	0.46 (0.06)	--	--	1.23 (0.09)	1.08 (0.10)	--	--	4.84 (0.23)	1.87 (0.10)	0.64 (0.09)	-2.34 (0.12)
3	0.75 (0.03)	0.35 (0.06)	--	--	2.29 (0.13)	1.05 (0.12)	--	--	6.63 (0.34)	3.86 (0.19)	2.70 (0.15)	-1.46 (0.12)
4	0.73 (0.04)	0.36 (0.06)	--	--	2.11 (0.12)	1.05 (0.12)	--	--	6.04 (0.29)	3.11 (0.15)	2.01 (0.13)	-1.67 (0.12)
5	0.79 (0.03)	0.35 (0.06)	--	--	2.70 (0.15)	1.18 (0.15)	--	--	6.36 (0.32)	3.82 (0.20)	2.73 (0.17)	-1.65 (0.14)
6	0.80 (0.03)	0.30 (0.07)	--	--	2.60 (0.14)	0.98 (0.14)	--	--	6.76 (0.34)	4.21 (0.21)	3.17 (0.17)	-1.60 (0.13)
7	0.83 (0.02)	0.11 (0.07)	--	--	2.59 (0.14)	0.33 (0.12)	--	--	7.17 (0.37)	4.69 (0.22)	3.51 (0.18)	-0.63 (0.11)
8	0.58 (0.05)	0.45 (0.07)	--	--	1.43 (0.09)	1.11 (0.13)	--	--	4.73 (0.23)	2.27 (0.13)	0.71 (0.10)	-2.41 (0.13)
9	0.63 (0.05)	0.47 (0.07)	--	--	1.72 (0.11)	1.29 (0.15)	--	--	5.81 (0.31)	3.01 (0.17)	1.69 (0.13)	-2.52 (0.14)
11	0.92 (0.02)	-0.18 (0.07)	--	--	4.45 (0.35)	-0.89 (0.24)	--	--	9.61 (0.66)	6.86 (0.48)	5.95 (0.42)	0.78 (0.18)
12	0.94 (0.01)	-0.10 (0.06)	--	--	4.91 (0.35)	-0.52 (0.20)	--	--	10.19 (0.64)	7.22 (0.47)	5.76 (0.39)	0.46 (0.19)
Social Cohesion												
1	0.44 (0.05)	--	0.57 (0.04)	--	1.09 (0.09)	--	1.42 (0.09)	--	5.37 (0.26)	3.42 (0.15)	2.29 (0.12)	-1.69 (0.11)
2	0.44 (0.05)	--	0.73 (0.04)	--	1.41 (0.12)	--	2.35 (0.15)	--	9.80 (0.91)	6.12 (0.31)	3.64 (0.20)	-2.49 (0.16)
4	0.45 (0.05)	--	0.79 (0.03)	--	1.82 (0.15)	--	3.23 (0.20)	--	9.87 (0.61)	6.05 (0.33)	2.96 (0.21)	-3.78 (0.23)
5	0.48 (0.05)	--	0.77 (0.03)	--	1.95 (0.16)	--	3.15 (0.19)	--	9.15 (0.52)	6.02 (0.32)	2.88 (0.21)	-3.82 (0.22)
6	0.46 (0.05)	--	0.81 (0.03)	--	2.20 (0.19)	--	3.84 (0.27)	--	10.74 (0.71)	7.19 (0.46)	3.70 (0.30)	-4.76 (0.30)
7	0.40 (0.05)	--	0.75 (0.03)	--	1.27 (0.11)	--	2.39 (0.14)	--	7.37 (0.40)	4.12 (0.20)	1.26 (0.13)	-3.63 (0.18)
8	0.59 (0.05)	--	0.41 (0.05)	--	1.46 (0.11)	--	1.02 (0.10)	--	1.66 (0.11)	-4.12 (0.20)	--	--
9	0.60 (0.04)	--	0.38 (0.05)	--	1.45 (0.10)	--	0.92 (0.09)	--	0.79 (0.09)	-4.41 (0.21)	--	--
10	0.40 (0.05)	--	0.59 (0.04)	--	0.99 (0.09)	--	1.46 (0.09)	--	5.77 (0.31)	3.19 (0.14)	1.46 (0.10)	-3.01 (0.14)
Capacity for Social Control												
1	0.64 (0.04)	--	--	0.40 (0.06)	1.65 (0.10)	--	--	1.03 (0.11)	5.81 (0.30)	3.58 (0.16)	2.54 (0.13)	-1.50 (0.11)
2	0.69 (0.03)	--	--	0.49 (0.05)	2.24 (0.14)	--	--	1.60 (0.15)	6.84 (0.38)	3.57 (0.20)	2.74 (0.17)	-1.76 (0.14)
3	0.80 (0.03)	--	--	0.47 (0.05)	3.58 (0.27)	--	--	2.08 (0.24)	8.72 (0.58)	5.58 (0.37)	4.38 (0.30)	-0.85 (0.17)
5	0.79 (0.03)	--	--	0.39 (0.05)	2.84 (0.17)	--	--	1.42 (0.16)	5.83 (0.29)	4.33 (0.22)	3.54 (0.20)	-0.67 (0.13)
6	0.54 (0.04)	--	--	0.12 (0.07)	1.11 (0.08)	--	--	0.24 (0.09)	3.14 (0.13)	1.76 (0.09)	-1.09 (0.08)	--
Model Information												
-2 Log Likelihood	52313.22											
AIC	52603.22											
BIC	53342.48											
M_2 (df)	25331.07	(4278)										
RMSEA	0.06											

dimension, only items Social Cohesion 8 and 9 had higher loadings on the general factor than the group factor. For all other items, the loadings on the group factor were much higher than the loadings on the general factor.

While the fit of the model appeared adequate as indicated by a RMSEA of 0.06, there were additional concerns regarding violations of the assumption of local item independence. Specifically, the results indicated that a number of item pairs demonstrated high local dependence according to the Chen-Thissen (1997) *LD* statistic. Given the large number of surplus items and the desire to winnow the measure to a smaller item set, the first strategy adopted for addressing concerns of local dependence was to drop one of the item pairs from the scale. Pairs of items with local dependence represent less than a full two items worth of information (Yen, 1993) and dropping one of the affected items is a reasonable strategy for addressing local dependence (Reeve et al., 2007). Items were eliminated according to the largest unexpected LD item statistic pair. The following items (listed in the order of deletion) were eliminated to reduce the extent of local dependence in the measure: Social Cohesion 8, Willingness to Intervene 6, Capacity for Social Control 1, Willingness to Intervene 8, and Willingness to Intervene 5. Examination of item characteristic curves and information curves from a unidimensional model suggests that Willingness to Intervene 8 contributes very little information to this scale. The information content of Social Cohesion 8 and Capacity for Social Control 1 were higher, but still remained relatively low. For Willingness to Intervene 5 and 6, there was a substantial information contribution; however, the contribution was primarily confined to the lower ranges of the latent variable (less than 1 theta). There was substantial overlap with additional items over this range, so the loss of precision is likely minimal.

While this strategy did substantially reduce the amount of local item dependence, issues with local dependence still remain.[14] Some of the remaining local dependence may be due to sparseness in the response patterns to particular items. However, it is suspected that since the underlying construct references perceptions of the larger community, there are many nuisance variables that may generate correlations between particular items in any perceptions of collective efficacy scale. As such, we decided that the remaining 20 items constitute the final items used to construct the measures.

A final bifactor IRT model was created using the reduced scale. Scores were computed using the Bayes expected *a posteriori* (EAP) estimator (see SSI, 2011b). Since IRTPRO does not produce item information or test information curves for bifactor models, models were re-estimated in MPLUS (Muthén & Muthén, 2011). Test information curves and EAP scores plotted against the posterior standard deviation are used to discuss the precision of the instrument across the range of the four latent variables estimated by the model. The results from the final bifactor IRT model are presented in Table 14.

While the M_2 statistic was statistically significant, the model RMSEA increased slightly but was .07 and indicated adequate fit. The $S\text{-}X^2$ statistics for item fit (see Orlando & Thissen, 2000, 2003; SSI, 2011b) was significant for all items and high for most ($p < .05$ for Social Cohesion 9 and Capacity for Social Control 3; $p < .01$ for all other items) suggesting problematic item fit to the response model. With the exception of item Willingness to Intervene 2, all items from the Willingness to Intervene and Capacity for Social Control dimensions had much higher loadings on the general dimension compared to the corresponding group dimensions. Again, based on

[14] A model was also examined that included a testlet for Willingness to Intervene 11 and 12, but this model offered neither an improvement in fit nor further addressed any outstanding issues with local dependence.

these results, it appeared that the group factors for the Willingness to Intervene and Capacity for Social Control domains represent common measurement variance due to shared question wording and item content, rather than substantively meaningful dimensions.

We found much different results for the Social Cohesion dimension. With the exception of item Social Cohesion 9 and to a lesser extent Social Cohesion 1, the remaining items from the Social Cohesion domain had substantially higher loadings on the group factor compared to the general factor. This suggested that while items from the Social Cohesion domain contribute to the general factor of perceptions of collective efficacy, the group factor for Social Cohesion remains substantively important.

We used MPLUS to generate test item information plots. An examination of the estimates between IRTPRO and MPLUS revealed that there was little difference in the estimates aside from a difference in parameterization. Figure 5 presents the total test information curves for the four dimensions of the scale. The test information curves are equal to the sum of all the item information curves and illustrate the precision in measurement over the range of the latent scores. Since the standard error is the inverse of the information, low test information values suggest high standard errors and lower precision. The test information is graphed between +/- 4 standard deviations.

The test information curve for perceptions of collective efficacy reveals that the total information is high at its peak, suggesting substantial precision of the scale at differentiating values close to the mean (roughly +/- 0.5 standard deviations).

Table 14. Final Results from the Bifactor IRT model.

	Loadings				Model Parameters							
Item	λ_1	λ_2	λ_3	λ_4	a_1	a_2	a_3	a_4	c_1	c_2	c_3	c_4
Willingness to Intervene												
1	0.74 (0.03)	0.25 (0.06)	--	--	2.01 (0.12)	0.69 (0.11)	--	--	5.84 (0.29)	3.77 (0.17)	2.89 (0.14)	-1.00 (0.10)
2	0.53 (0.05)	0.51 (0.06)	--	--	1.34 (0.10)	1.30 (0.13)	--	--	5.18 (0.27)	2.01 (0.12)	0.69 (0.09)	-2.52 (0.14)
3	0.77 (0.03)	0.40 (0.06)	--	--	2.61 (0.16)	1.37 (0.16)	--	--	7.42 (0.43)	4.26 (0.23)	2.99 (0.18)	-1.64 (0.14)
4	0.74 (0.04)	0.39 (0.06)	--	--	2.30 (0.14)	1.22 (0.14)	--	--	6.51 (0.35)	3.32 (0.18)	2.14 (0.14)	-1.80 (0.13)
7	0.83 (0.02)	0.03 (0.07)	--	--	2.50 (0.14)	0.10 (0.12)	--	--	6.93 (0.36)	4.58 (0.21)	3.44 (0.17)	-0.62 (0.11)
9	0.64 (0.04)	0.28 (0.07)	--	--	1.52 (0.09)	0.67 (0.11)	--	--	5.09 (0.25)	2.61 (0.12)	1.46 (0.10)	-2.20 (0.11)
11	0.91 (0.02)	-0.24 (0.07)	--	--	4.67 (0.39)	-1.24 (0.25)	--	--	10.15 (0.76)	7.26 (0.55)	6.31 (0.49)	0.82 (0.19)
12	0.94 (0.01)	-0.13 (0.06)	--	--	5.04 (0.37)	-0.69 (0.19)	--	--	10.41 (0.68)	7.40 (0.49)	5.92 (0.41)	0.47 (0.19)
Social Cohesion												
1	0.45 (0.05)	--	0.57 (0.04)	--	1.10 (0.09)	--	1.41 (0.09)	--	5.38 (0.26)	3.42 (0.15)	2.29 (0.12)	-1.69 (0.10)
2	0.44 (0.05)	--	0.72 (0.04)	--	1.44 (0.12)	--	2.34 (0.15)	--	9.82 (0.91)	6.11 (0.30)	3.63 (0.20)	-2.48 (0.15)
4	0.45 (0.05)	--	0.79 (0.03)	--	1.85 (0.16)	--	3.25 (0.21)	--	9.91 (0.62)	6.06 (0.33)	2.98 (0.21)	-3.80 (0.23)
5	0.49 (0.05)	--	0.77 (0.03)	--	2.01 (0.16)	--	3.18 (0.20)	--	9.24 (0.53)	6.06 (0.32)	2.91 (0.20)	-3.86 (0.23)
6	0.47 (0.05)	--	0.80 (0.03)	--	2.26 (0.19)	--	3.83 (0.27)	--	10.75 (0.69)	7.18 (0.45)	3.70 (0.28)	-4.77 (0.30)
7	0.41 (0.05)	--	0.74 (0.03)	--	1.32 (0.11)	--	2.39 (0.14)	--	7.40 (0.40)	4.13 (0.20)	1.28 (0.13)	-3.66 (0.18)
9	0.59 (0.05)	--	0.35 (0.05)	--	1.40 (0.10)	--	0.82 (0.09)	--	0.76 (0.09)	-4.29 (0.20)	--	--
10	0.41 (0.05)	--	0.59 (0.04)	--	1.01 (0.09)	--	1.46 (0.09)	--	5.78 (0.31)	3.20 (0.14)	1.46 (0.10)	-3.02 (0.14)
Capacity for Social Control												
2	0.70 (0.03)	--	--	0.40 (0.06)	2.02 (0.12)	--	--	1.15 (0.13)	6.21 (0.32)	3.21 (0.16)	2.44 (0.14)	-1.60 (0.12)
3	0.80 (0.03)	--	--	0.40 (0.06)	3.45 (0.28)	--	--	1.97 (0.27)	8.65 (0.68)	5.49 (0.43)	4.27 (0.35)	-0.93 (0.16)
5	0.77 (0.03)	--	--	0.47 (0.06)	3.08 (0.25)	--	--	1.88 (0.25)	6.56 (0.48)	4.83 (0.35)	3.93 (0.30)	-0.81 (0.16)
6	0.51 (0.05)	--	--	0.25 (0.08)	1.06 (0.08)	--	--	0.52 (0.11)	3.18 (0.14)	1.78 (0.09)	-1.11 (0.08)	--
Model Information												
-2 Log Likelihood	42086.33											
AIC	42320.33											
BIC	42916.84											
M_2 (df)	18812.44	(2774)										
RMSEA	0.07											

The curve descends fairly rapidly for values greater than 0.75 standard deviations and beyond, suggesting that the scale suffers a substantial loss of precision in differentiating individuals with high perceptions of collective efficacy. The measure performs better for lower ranges as a substantial decrease in information does not begin until -1.5 standard deviations. While there is some loss of precision between 0 and -1 standard deviations, the overall information remains high.

The test information curve for perceptions of willingness to intervene and capacity of social control indicates that there is very little precision as the information values are low, supporting the conclusion that these represent nuisance dimensions in the measure. However, controlling for these dimensions should reduce bias in the measure of perceptions of collective efficacy. In contrast, perceptions of social cohesion appear to be measured with precision. This measure appears to perform well between -1.5 and -0.5 standard deviations and 1 and 1.5 standard deviations. There is a substantial loss of precision beyond +/- 2 standard deviations, as well as between -0.5 and 0.5 standard deviations, with a local minima occurring just positive of the mean. This local minima suggests that the measure lacks precision at differentiating between individuals with either slightly low or slightly high perceptions of social cohesion.

Figure 6 further illustrates the concerns regarding the precision of measurement for the four latent variables underlying the scale. Presented is a plot of EAP scores against their posterior standard deviation (see SSI, 2011b). This posterior standard deviation can be regarded as a measure of the precision of the scores, with higher posterior standard deviations equating to lower measurement precision.

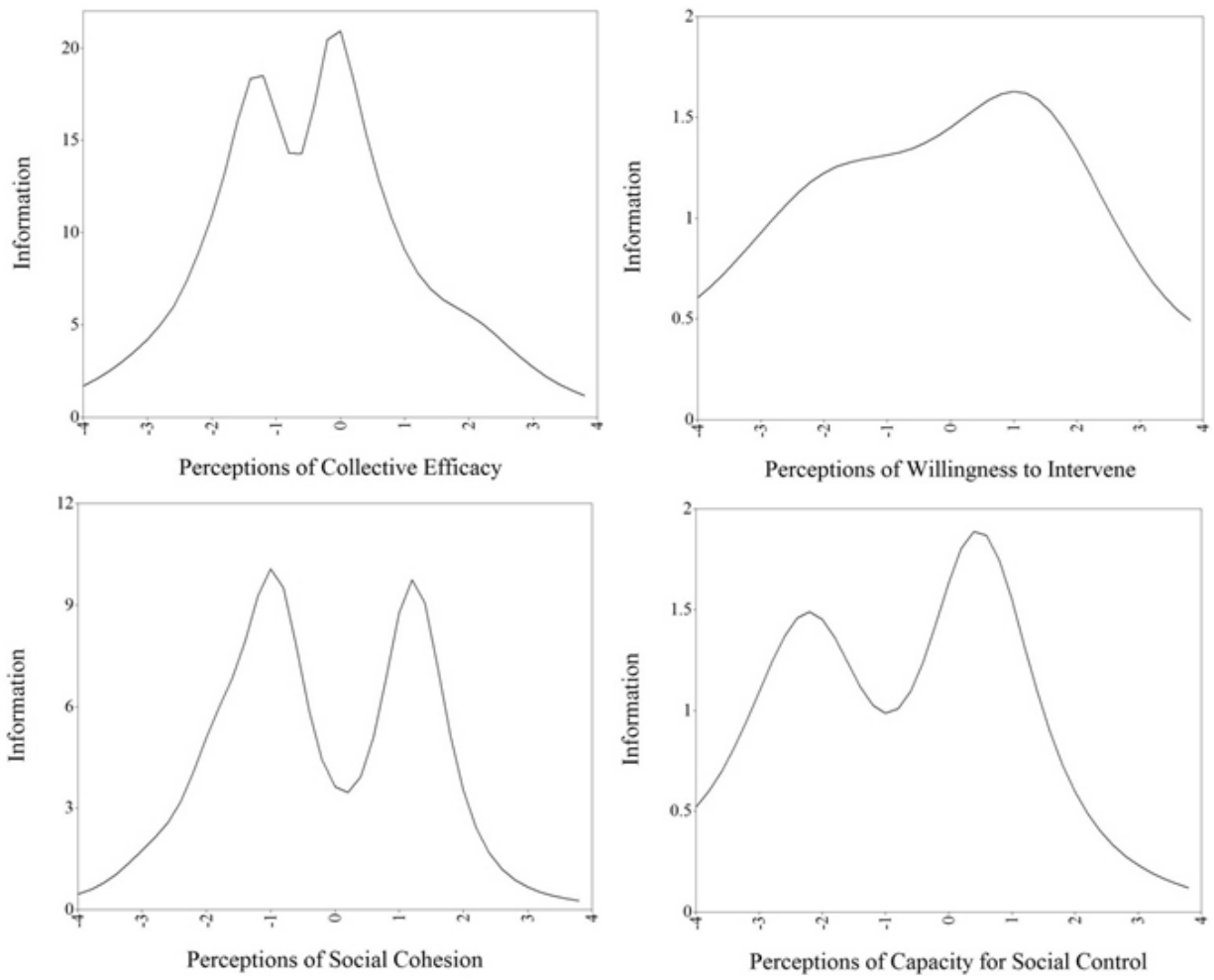


Figure 5. Test Information Plots for Perceptions of Collective Efficacy, Willingness to Intervene, Social Cohesion, and Capacity for Social Control.

These plots are presented using a common metric to facilitate comparisons. The mean of each latent variable is zero and the values range between +/- 4 standard deviations. For perceptions of collective efficacy, the loss of precision for high values of the latent variable is apparent as the posterior standard deviation dramatically increases after the mean. The majority of observed values, however, appear to be measured with high precision. For perceptions of willingness to intervene and capacity of social control, the high posterior standard deviations confirm that these variables are measured with little precision. Finally, the plot for perceptions of social cohesion shows that this latent variable is measured with some precision. The scores are less tightly clustered than for perceptions of collective efficacy, likely due to the local minima in test information near the mean. The posterior standard deviations also become large after approximately +/- 1 standard deviation from the mean.

Differential Item Functioning (DIF)

As previously mentioned, assessing DIF in multidimensional measures is much more difficult than assessing DIF in unidimensional measures. Yang, Tommet, and Jones (2009) present a framework for investigating DIF in the bifactor model using the Muliple Indicator and Multiple Causes (MIMIC) model (for a description of the MIMIC model see Gallo, Anthony, & Muthén, 1994; Muthén, 1989). While this framework cannot distinguish between uniform and non-uniform DIF, it can detect any DIF that results in a difference in the conditional probability of response across groups (Yang et al., 2009).

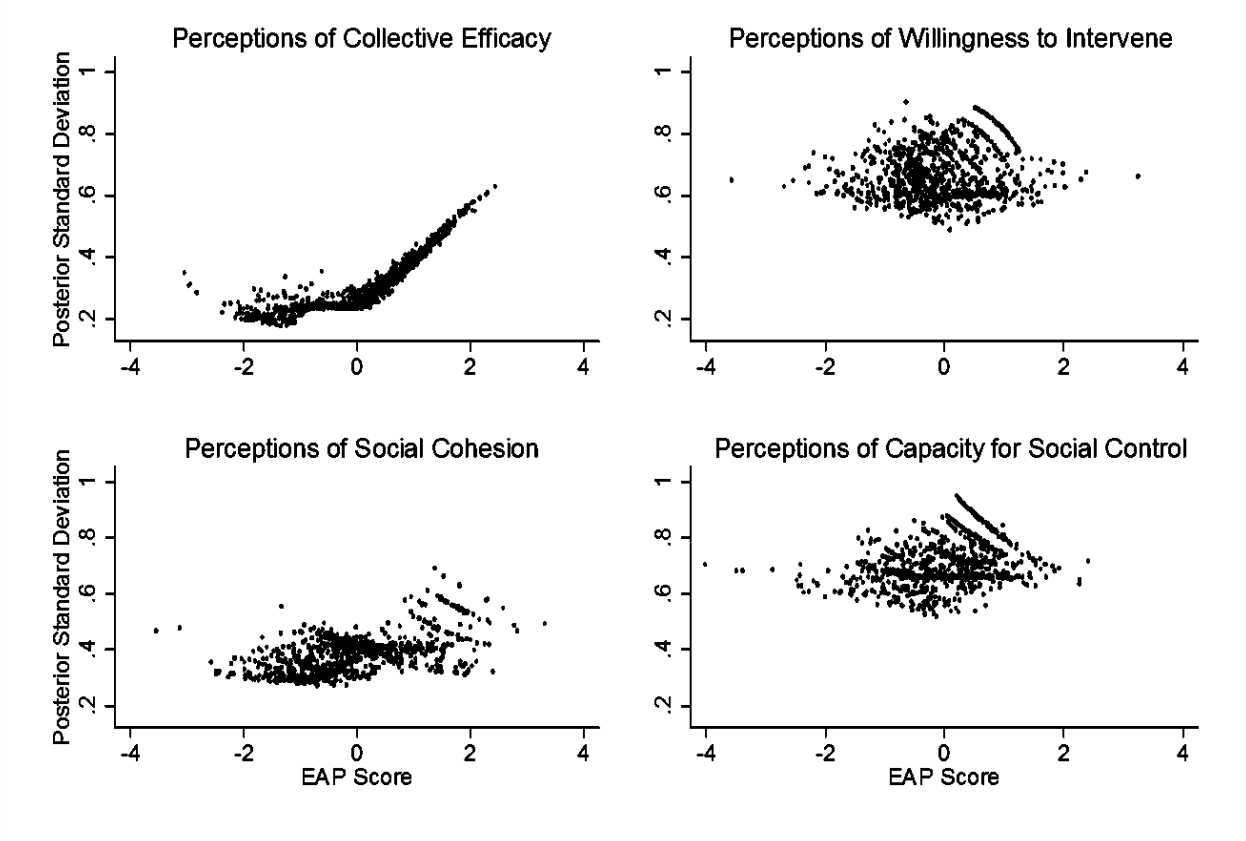


Figure 6. Plots of EAP Scores against Posterior Standard Deviations.

The MIMIC model provides a mechanism for distinguishing between various types of effects that might be observed between the group, the general factor, the group factor, and the item response. This general framework is presented in Figure 7 and is adopted from Yang et al. (2009). The total effect of the group variable on the measurement model can be decomposed into three separate types of effects. The *general effect* represents relationship between the group variable and the general factor (perceptions of collective efficacy). The *specific effect* reflects the relationship between the group variable and the group factor (perceptions of willingness to intervene, social cohesion, or capacity for social control). The *DIF effect* is the remaining direct effect between the group variable and the item. If the bifactor model was forced into a unidimensional model for assessing DIF effects, the specific effect and the DIF effect would be combined, potentially overstating the difference in item response between groups.

The importance of identifying general and specific effects is that these effects may produce group differences in response, but do not indicate the presence of item bias. Essentially, group and specific effects suggest that the groups under consideration differ in their responses to the scale due to differences in the distribution of the latent variables by group. In the current study, it would not be surprising to identify general and specific effects for African- American respondents compared to non-African-American respondents as there are important differences in the nature of the communities in which African-American respondents dwell (in the current study, African-American respondents are much more likely to live in Brownsville and Bunche Park which are low socioeconomic status, high crime neighborhoods). DIF effects, on the other hand, indicate that members of a particular group are less likely to endorse a particular item. These effects are more troublesome because this suggests that the difference in responses to a particular item between groups cannot be explained by group differences attributable to the

underlying latent variables. Ultimately, it is desirable to select items that minimize DIF effects if at all possible as this minimizes the possibility of item bias.

For the current analysis, potential DIF effects for gender and race/ethnicity groups were examined. Again, these analyses were restricted to the 1,210 cases with complete information for all items in the perceptions of collective efficacy scale and for the gender and race covariates. Two separate MIMIC models were used, a unidimensional and a bifactor model to assess the degree to which the unidimensional model overstate DIF effects. These models were estimated in MPLUS (Muthén & Muthén, 2011) using the logit link for item responses and the WLSMV estimator.

An important consideration for the specification of DIF effects is the need for "anchor items," *i.e.*, items that are treated as lacking a DIF effect for the purposes of identifying the latent variable. Yang et al. (2009) used a "forwards selection procedure" for identifying a set of anchor items as the restriction of no DIF effect was sequentially relaxed starting with items with the largest modification index. In this research, an alternative backwards selection procedure was used. While Yang et al. (2009) began with a restrictive model and moved towards a less restrictive model, this procedure started with a non-restrictive model and moved towards a more restrictive model.[15] First, models that included only DIF effects (*i.e.*, did not introduce the bifactor structure) were used to identify items with the smallest DIF effects for each group variable. These items were then treated as the initial anchor items and the MIMIC model was estimated. Using these results, an item with non-significant DIF effects was specified as anchor items and the restrictions of no DIF effects for the initial anchor items were relaxed in

[15] This change in procedure was primarily motivated by the difficulty in obtaining modification indices from a prior version of MPLUS than what was used by Yang et al. (2009).

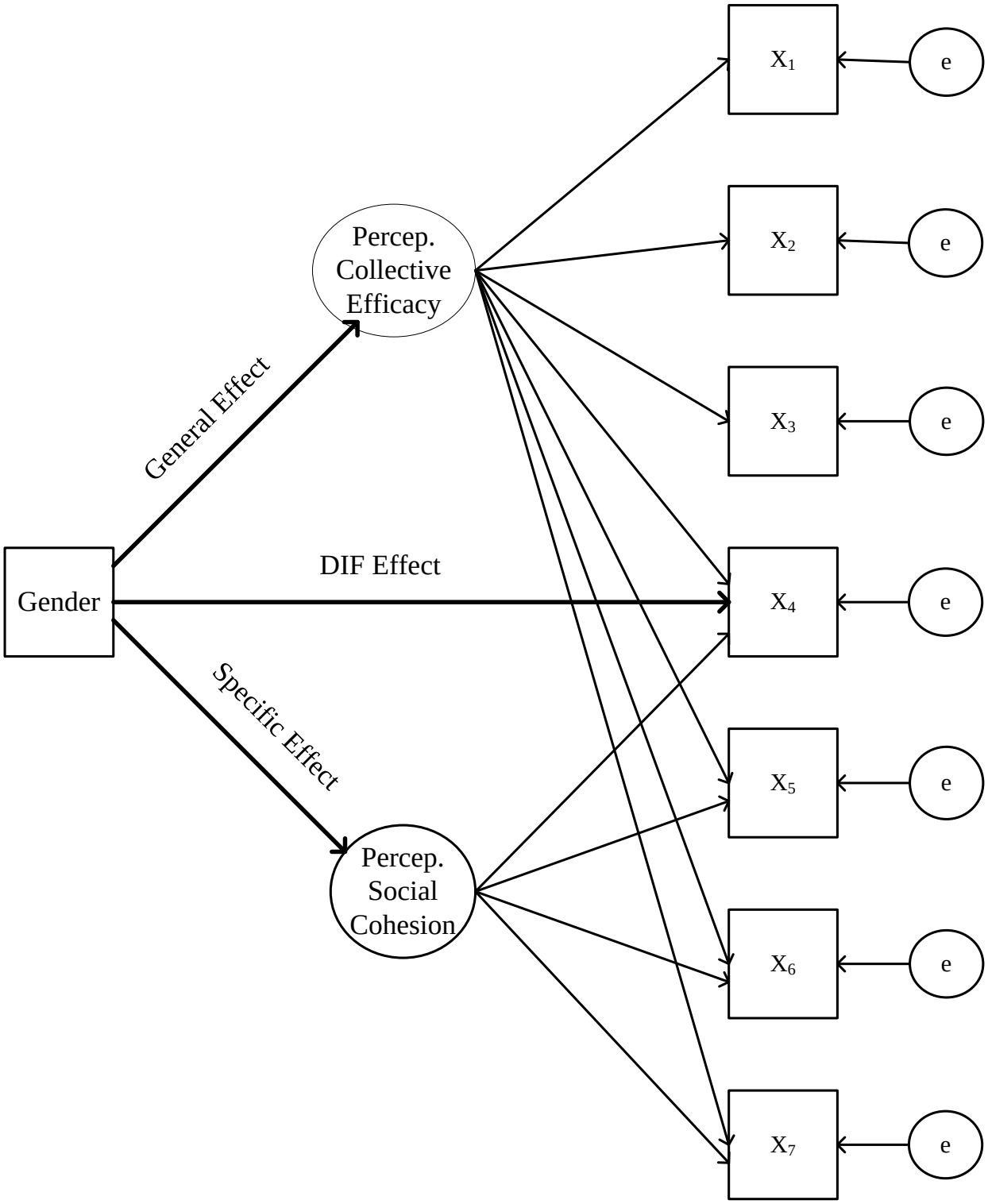


Figure 7. Illustration of General, Specific, and DIF Effects

subsequent models.[16] This provided a mechanism to ensure reasonable starting anchor items. Following this, sequential models were estimated where items showing no DIF effects for a particular group variable were specified as anchor items (increasing the precision of the latent variable), and the model was re-estimated. This procedure was continued until the only DIF effects remaining in the model were statistically significant.

The results from the unidimensional models are presented in Tables 15A and 15B. Table 15A only presents the *a* and *c* parameters from the unidimensional model that were discussed earlier and are included for completeness. Table 15B presents the estimates for the general and DIF effects from the unidimensional model. All items marked with *X* were anchor items and DIF effects were set to zero. Unstandardized coefficients and standard errors are presented as well as odds-ratios (exponentiated coefficients). Following suggestions by Yang et al. (2009; also Cole, Kawachi, Maller, & Berkman, 2000) odds ratios above 2.0 or below 0.5 were considered meaningful item biases and are highlighted in bold. As indicated in this table, there was little evidence for a general effect for either gender or race/ethnicity. There was also little evidence for DIF effects for gender. There was, however, considerable evidence for DIF effects for the majority of items for Blacks and Hispanics. For the 16 items showing DIF effects for Black respondents, the odds ratios suggested that Blacks were less likely to endorse all items compared to non-Black/non-Hispanic respondents. Similarly, for the 10 items exhibiting DIF effects for

[16] In the event that there were no additional non-significant DIF effects, the item with the smallest significant DIF effect was selected as the new temporary anchor for the purposes of evaluating DIF effects with the original anchor. Following this, if the original anchor item showed non-significant DIF effects, it was restored as an anchor item and the restriction of no DIF effect on the temporary anchor item was relaxed. The purpose of this procedure was to identify a suitable starting anchor item set for the sequential models.

Hispanic respondents, Hispanics were less likely to endorse these items compared to non-Black/non-Hispanic respondents.

Table 15A. Parameter Estimates for Measurement Model in the Unidimensional IRT MIMIC Model

Item	a_1	c_1	c_2	c_3	c_4
Willingness to Intervene					
1	1.95 (0.11)	-6.37 (0.34)	-4.49 (0.26)	-3.67 (0.24)	0.07 (0.21)
2	1.13 (0.07)	-4.57 (0.24)	-1.94 (0.16)	-0.86 (0.15)	1.77 (0.16)
3	2.04 (0.11)	-6.24 (0.34)	-3.96 (0.25)	-2.92 (0.23)	0.79 (0.21)
4	1.76 (0.10)	-5.74 (0.30)	-3.29 (0.22)	-2.36 (0.20)	0.83 (0.19)
7	2.19 (0.12)	-7.05 (0.40)	-4.93 (0.29)	-3.90 (0.27)	-0.12 (0.23)
9	1.37 (0.08)	-4.65 (0.25)	-2.38 (0.16)	-1.33 (0.14)	2.04 (0.15)
11	2.46 (0.15)	-7.08 (0.40)	-5.30 (0.33)	-4.73 (0.32)	-1.46 (0.26)
12	3.06 (0.18)	-7.91 (0.47)	-5.90 (0.39)	-4.97 (0.36)	-1.35 (0.30)
Social Cohesion					
1	1.29 (0.08)	-5.74 (0.31)	-3.94 (0.22)	-2.93 (0.20)	0.65 (0.18)
2	1.53 (0.10)	-8.13 (0.74)	-5.31 (0.29)	-3.31 (0.22)	1.18 (0.19)
4	1.66 (0.10)	-6.72 (0.44)	-4.05 (0.23)	-2.14 (0.20)	1.90 (0.20)
5	1.77 (0.10)	-6.70 (0.38)	-4.52 (0.25)	-2.57 (0.21)	1.62 (0.20)
6	1.82 (0.11)	-7.04 (0.40)	-4.85 (0.26)	-2.93 (0.22)	1.64 (0.21)
7	1.44 (0.09)	-5.68 (0.34)	-3.13 (0.20)	-1.09 (0.17)	2.29 (0.19)
9	1.49 (0.10)	-1.28 (0.19)	3.59 (0.24)	--	--
10	1.28 (0.08)	-5.30 (0.31)	-2.95 (0.18)	-1.40 (0.15)	2.47 (0.17)
Capacity for Social Control					
2	1.89 (0.10)	-6.26 (0.33)	-3.58 (0.23)	-2.91 (0.22)	0.66 (0.20)
3	2.54 (0.14)	-7.02 (0.38)	-4.82 (0.31)	-4.01 (0.29)	-0.30 (0.25)
5	2.26 (0.13)	-5.46 (0.31)	-4.29 (0.28)	-3.67 (0.26)	-0.25 (0.23)
6	1.11 (0.08)	-3.07 (0.16)	-1.72 (0.13)	1.11 (0.12)	--

Table 15B. Parameter Estimates for Differential Item Functioning in the Unidimensional IRT MIMIC Model

	Gender		Black		Hispanic	
	b (SE)	OR	b (SE)	OR	b (SE)	OR
General Effects						
Percept. Collective Efficacy	-0.06 (0.06)	NA	0.06 (0.12)	NA	0.09 (0.10)	NA
DIF Effects						
Willingness to Intervene						
1	X		-1.24* (0.25)	**0.29**	-1.09* (0.22)	**0.34**
2	X		-0.97* (0.19)	**0.38**	-0.17 (0.16)	0.85
3	X		-0.89* (0.25)	**0.41**	-0.62* (0.21)	0.54
4	X		-1.21* (0.23)	**0.30**	-0.65* (0.20)	0.52
7	X		-1.16* (0.27)	**0.31**	-0.87* (0.23)	**0.42**
9	X		X		X	
11	X		-1.60* (0.30)	**0.20**	-1.23* (0.26)	**0.29**
12	X		-1.68* (0.34)	**0.19**	-1.33* (0.29)	**0.27**
Social Cohesion						
1	-0.19 (0.12)	0.83	-1.64* (0.22)	**0.19**	-0.72* (0.18)	**0.49**
2	X		-1.41* (0.24)	**0.25**	-0.67* (0.20)	0.51
4	X		-1.06* (0.23)	**0.35**	-0.32 (0.19)	0.73
5	X		-1.68* (0.25)	**0.19**	-0.78* (0.20)	**0.46**
6	X		-1.36* (0.25)	**0.26**	-1.16* (0.21)	**0.31**
7	X		-0.20 (0.21)	0.82	-0.34 (0.18)	0.71
9	X		-0.92* (0.24)	**0.40**	-0.67 (0.20)	0.51
10	-0.28* (0.12)	0.75	X		X	
Capacity for Social Control						
2	X		-1.28* (0.24)	**0.28**	-0.82* (0.21)	**0.44**
3	X		-1.64* (0.29)	**0.19**	-1.06* (0.25)	**0.35**
5	X		-1.32* (0.27)	**0.27**	-0.98* (0.23)	**0.38**
6	X		X		X	

* $p < .05$

X = anchor item, parameter not estimated

BOLD = OR > 2.0 or OR < 0.5

The unidimensional MIMIC model is problematic in this situation as specific effects are combined with DIF effects, thus overstating potential item bias. For this reason, a bifactor MIMIC model was used to assess the degree to which the observed DIF effects from the unidimensional model could be attributed to specific effects. The results of the bifactor MIMIC model are presented in Tables 16A and 16B. Again, Table 16A presents the *a* and *c* parameters from the bifactor model discussed previously. The general, specific, and DIF effects are presented in Table 16B.

Importantly, these results reveal that after controlling for the multidimensional structure of the scale, there appeared to be a general effect for both Black and Hispanic respondents. This suggests that non-Black/non-Hispanic respondents had higher perceptions of collective efficacy.[17] Two specific effects were also identified in this model, between gender and perceptions of social cohesion and between Hispanic respondents and perceptions of collective efficacy. These results suggested that females had lower levels of perceptions of social cohesion compared to males, and Hispanic respondents had higher levels of perceptions of social cohesion compared to non-Black/non-Hispanic respondents. Interestingly, the bifactor MIMIC model demonstrated substantially fewer DIF effects compared to the unidimensional MIMIC model. Again, there was no evidence for DIF effects for gender for any of the items. Only one item from the willingness to intervene domain demonstrated a significant DIF effect for Hispanics, but the size of the effect was small. All other items from this domain demonstrated no significant DIF effect and were treated as anchor items. None of the items from the capacity for social control dimension demonstrated any significant DIF effects. There were, however, some remaining DIF

[17] Odds ratios are not reported for general and specific effects because these variables are continuous. Further, since these variables have a standardized metric (means equal to zero, variances equal to one), these coefficients can be interpreted similar to standardized effects.

effects for items from the social cohesion dimension of the scale. Five of the items from this domain exhibited sizable DIF effects for both Blacks and Hispanics. Social Cohesion items 1, 2, 4, 5, and 6 all show DIF effects where Black and Hispanic respondents are less likely to endorse the item compared to non-Black, non-Hispanic respondents.

Conclusions

Although the preceding analyses were confined to the revised perceptions of collective efficacy scale, a fortunate byproduct of this process is that it provides some conclusions about the psychometric properties of both the Sampson et al. (1997) scale and the extended version discussed here. To this end, four questions can be raised concerning the psychometric properties of this scale: 1. Do the items from Sampson et al. (1997) reflect an optimum set of indicators from the larger domain of questions? 2. Do the items in the scale meet the critical assumptions of the IRT models that have been employed? 3. Does the scale itself adequately reflect various scores across the latent dimension with sufficient precision? 4) Do the items in the scale demonstrate measurement invariance across critical groups of individuals?

The first question is whether the set of questions from the Sampson, Raudenbush, and Earls (1997) scale represent an optimum set of indicators. The results of these analyses suggest that they are not. Three of the items from the original scale were deleted due to concerns of local item dependence. Seeing that a substantial amount of this local dependence occurred with other items within the original scale, it is likely that similar local item dependence would be observed with the original scale. Examining the item discrimination parameters also suggested that while many of the original items had high discrimination for the general factor of collective efficacy, many of the other items performed equally as well.

Table 16A. Parameter Estimates for Measurement Model in the Bifactor IRT MIMIC Model

Item	a_1	a_2	a_3	a_4	c_1	c_2	c_3	c_4
Willingness to Intervene								
1	1.99 (0.12)	0.70 (0.11)	--	--	-6.67 (0.37)	-4.58 (0.27)	-3.70 (0.25)	0.21 (0.22)
2	1.34 (0.10)	1.32 (0.13)	--	--	-5.50 (0.32)	-2.31 (0.20)	-0.98 (0.18)	2.26 (0.20)
3	2.58 (0.16)	1.34 (0.16)	--	--	-7.96 (0.49)	-4.82 (0.32)	-3.56 (0.29)	1.05 (0.24)
4	2.28 (0.13)	1.21 (0.14)	--	--	-7.01 (0.41)	-3.83 (0.27)	-2.65 (0.24)	1.29 (0.22)
7	2.48 (0.14)	0.11 (0.12)	--	--	-7.54 (0.42)	-5.18 (0.29)	-4.04 (0.26)	0.02 (0.20)
9	1.51 (0.09)	0.65 (0.10)	--	--	-5.42 (0.28)	-2.95 (0.17)	-1.81 (0.15)	1.85 (0.16)
11	4.61 (0.39)	-1.22 (0.25)	--	--	-11.31 (0.96)	-8.42 (0.76)	-7.46 (0.70)	-1.97 (0.44)
12	5.00 (0.28)	-0.68 (0.20)	--	--	-11.66 (0.86)	-8.65 (0.70)	-7.16 (0.62)	-1.70 (0.43)
Social Cohesion								
1	1.04 (0.09)	--	1.39 (0.09)	--	-6.36 (0.33)	-4.38 (0.24)	-3.24 (0.22)	0.78 (0.20)
2	1.36 (0.12)	--	2.29 (0.15)	--	-10.71 (0.94)	-7.07 (0.40)	-4.59 (0.33)	1.47 (0.27)
4	1.79 (0.16)	--	3.23 (0.20)	--	-10.87 (0.71)	-6.96 (0.46)	-3.84 (0.37)	2.95 (0.35)
5	1.94 (0.16)	--	3.20 (0.19)	--	-10.99 (0.66)	-7.70 (0.48)	-4.48 (0.39)	2.40 (0.35)
6	2.31 (0.21)	--	4.05 (0.28)	--	-13.30 (0.90)	-9.60 (0.68)	-6.00 (0.54)	2.95 (0.44)
7	1.35 (0.12)	--	2.47 (0.14)	--	-8.04 (0.48)	-4.73 (0.31)	-1.79 (0.27)	3.27 (0.29)
9	1.37 (0.10)	--	0.82 (0.08)	--	-1.34 (0.20)	3.71 (0.25)	--	--
10	1.03 (0.09)	--	1.48 (0.09)	--	-6.03 (0.36)	-3.42 (0.23)	-1.65 (0.21)	2.89 (0.23)
Capacity for Social Control								
2	2.01 (0.12)	--	--	1.16 (0.13)	-6.78 (0.38)	-3.77 (0.25)	-3.00 (0.23)	1.06 (0.20)
3	3.44 (0.28)	--	--	2.00 (0.26)	-9.65 (0.80)	-6.46 (0.58)	-5.24 (0.51)	-0.00 (0.33)
5	3.02 (0.23)	--	--	1.86 (0.23)	-7.34 (0.57)	-5.63 (0.47)	-4.73 (0.42)	-0.03 (0.30)
6	1.04 (0.08)	--	--	0.50 (0.11)	-3.45 (0.17)	-2.05 (0.13)	0.83 (0.11)	--

Table 16B. Parameter Estimates for Differential Item Functioning in the Bifactor IRT MIMIC Model

	Gender		Black		Hispanic	
	b (SE)	OR	b (SE)	OR	b (SE)	OR
General Effects						
Percept. Collective Efficacy	0.00 (0.06)	NA	-0.42* (0.10)	NA	-0.25* (0.08)	NA
Specific Effects						
Percept. Willingness to Intervene	-0.12 (0.08)	NA	-0.01 (0.13)	NA	0.19 (0.11)	NA
Percept. Social Cohesion	-0.16* (0.06)	NA	0.28 (0.16)	NA	0.26* (0.13)	NA
Percept. Capacity for Social Control	0.05 (0.09)	NA	-0.17 (0.13)	NA	-0.08 (0.12)	NA
DIF Effects						
Willingness to Intervene						
1	X		-0.22 (0.21)	0.80	-0.49* (0.18)	0.61
2	X		X		X	
3	X		X		X	
4	X		X		X	
7	X		X		X	
9	X		X		X	
11	X		X		X	
12	X		X		X	
Social Cohesion						
1	X		-1.71* (0.27)	**0.18**	-0.78* (0.22)	**0.46**
2	X		-1.75* (0.38)	**0.17**	-0.96* (0.32)	**0.39**
4	X		-1.84* (0.48)	**0.16**	-0.71 (0.39)	**0.49**
5	X		-2.80* (0.49)	**0.06**	-1.44* (0.40)	**0.24**
6	X		-2.46* (0.61)	**0.09**	-2.49* (0.51)	**0.09**
7	X		-0.34 (0.38)	0.71	-0.63* (0.31)	0.53
9	X		-0.52* (0.24)	0.60	-0.40* (0.20)	0.67
10	-0.16 (0.13)	0.85	X		X	
Capacity for Social Control						
2	X		X		X	
3	X		X		X	
5	X		X		X	
6	X		X		X	

* $p < .05$

X = anchor item, parameter not estimated

BOLD = OR > 2.0 or OR < 0.5

Additionally, the information curves and EAP plots indicate that the expanded set of items, which include the original Sampson et al. (1997) items, demonstrate a lack of measurement precision for high levels of collective efficacy. This suggests that the Sampson et al. (1997) items, as well as the expanded item set, do not adequately measure perceptions of collective efficacy across the feasible range of the latent variable. Finally, in the unidimensional MIMIC model (as this scale has typically been treated as unidimensional) most of the remaining items demonstrate considerable DIF effects for race/ethnicity. Fortunately, only one of the remaining items demonstrated a substantial DIF effect. Based on these results, it does not appear that the original Sampson et al. (1997) scale constitute an optimum set of items, but rather a promising start. This suggests that it may be beneficial to consider expanding the domain of items used to measure collective efficacy and further investigate the quality of potential items.

In regard to the second question, for this measure it appears that meeting the assumptions critical to the unidimensional IRT model is problematic. From this analysis, it is clear that the extended perceptions of collective efficacy scale demonstrated multidimensionality in both exploratory and confirmatory analyses. When comparing the loadings between the confirmatory bifactor IRT model to the confirmatory unidimensional IRT model, there were important differences that may be consequential if this multidimensionality is ignored in scale construction. Specifically, the contribution of the social cohesion items was overstated in the unidimensional model. The resulting score on a unidimensional scale would reflect a composite of the contribution of the general factor, perceptions of collective efficacy, and the group factor, perceptions of social cohesion. The consequences of ignoring the multidimensional structure for the remaining two item domains, perceptions of willingness to intervene and perceptions of the capacity for social control appeared to be less severe. In the confirmatory models, the loadings

for the bifactor and unidimensional models did not appear to differ substantially. Regardless, it may be preferable to incorporate these additional dimensions to reduce measurement error. It remains to be seen whether this observed multidimensionality is a consequence of using an expanded measure or if it emerges with the original Sampson et al. (1997) measure.

Additionally, some substantial problems remain in regard to the assumption of local item dependence. It was not possible to eliminate the presence of local item dependence, even after eliminating a number of items from the scale. While the current item set represents a trade-off between model fit and local item dependence, the consequences of remaining local item dependence remains unclear. A further concern is the lack of item and model fit. While the RMSEA of the final model was within acceptable bounds, the M_2 statistic was significant indicating some lack of fit. Further, item specific values for the $S\text{-}X^2$ item fit statistics for the final model were highly significant indicating a substantial lack of fit for the individual items. While non-parametric IRT models have been developed (see Sijtsma & Molenaar, 2002), it is unclear whether these models can be adapted to multidimensional and multilevel analyses.

The scale information curves and EAP score plots are particularly helpful in assessing whether there is sufficient measurement precision for this measure across the range of the latent variable. While there is substantial scale information for the measure of collective efficacy between approximately -2 standard deviations and 0.75 standard deviations from the mean of the latent variable (a standard error of measure approximately 0.1 at these boundaries), the amount of information drops fairly substantially outside of these boundaries. This is further confirmed by the EAP scores plot; at the high end of the scale it would appear that the current set of items does not measure high levels of collective efficacy with sufficient precision. Noting the high item means relative to the number of categories, this problem arises due to the relatively high

responses for individuals with perceptions of collective efficacy scores near the mean. Essentially, the distinctions between individuals with scores at the mean and scores above the mean are being made based on the top two response categories (4 vs. 5) for most of the items. This problem can be addressed by the addition of items that have higher discrimination values at higher levels of collective efficacy.

Two of the additional dimensions (willingness to intervene and capacity for social control) show very little measurement precision across the entire range of the respective latent variables. Based on the low loadings on the group factors, these dimensions appear to be nuisance dimensions rather than substantive dimensions within the measure. For this reason, there is likely little benefit in improving the precision of these dimensions beyond possible improvements to the measure of the general factor, perceptions of collective efficacy. Instead, the bifactor model can be used to eliminate the small bias introduced in perceptions of collective efficacy from these dimensions. Perceptions of social cohesion, on the other hand, may be a substantively important dimension in this scale. The scale information curve reveals a substantial gap in information precision in the local neighborhood of the mean (-0.5 to 0.5 standard deviations). This suggests that while the scale can differentiate between individuals with low perceptions of social cohesion and high perceptions of social cohesion; it fails to differentiate between high and low values close to the mean. Introducing items that have high discrimination near the mean would address this issue. The measure would also benefit from additional items that can discriminate between values at the high and low values of this latent variable.

Finally, the analyses presented here provide only partial information about measurement invariance. From preliminary IRT analyses, four items were eliminated from the scale due to substantial DIF between race/ethnicity groups. Several of the remaining items showed moderate

DIF between race/ethnicity groups. Unidimensional and bifactor MIMIC models were used to assess DIF effects for the expanded perceptions of collective efficacy scale. The unidimensional MIMIC model suggested substantial DIF effects for many of the items. However, after correcting for the multidimensional nature of the scale using the bifactor MIMIC, the number of DIF effects decreased and these effects were primarily confined to the social cohesion dimension. Given that these items are used in the construction of both the general factor of perceptions of collective efficacy and the group factor of perceptions of social cohesion, these DIF effects are problematic for both variables. Clearly, additional research is needed to develop items from the social cohesion dimension that exhibit negligible DIF effects across race/ethnicity groups. If such items cannot be found, then the framework used by Jeon et al. (2012) may be helpful in adjusting for DIF effects in a multilevel setting.

In sum, these results suggest that the perceptions of collective efficacy scale requires some improvement. While the current study represents the most thorough examination of this scale to date, a substantial amount of additional research remains. First, it is important to assess whether these results apply in other contexts. Second, it is necessary to determine the extent to which problems in measurement at the individual-level translate to problems in measurement at the aggregate-level. The nature of the current data prohibits a cross-level examination of this issue as very few neighborhoods are used. Future research using more neighborhoods should investigate the degree to which these issues complicate neighborhood-level measures. Finally, these results suggest that further development of the measure of perceptions of collective efficacy is necessary. Additional investigations of the measure of collective efficacy may resolve some of the issues that remain with violations of the assumptions of conventional IRT models.

CHAPTER IV. THE RELATIONSHIPS BETWEEN PERCEPTIONS OF COLLECTIVE EFFICACY AND SOCIAL COHESION AND OUTCOME VARIABLES

Abstract

In this chapter, we examine the relationships between collective efficacy (willingness to intervene) and perceptions of social cohesion (sense of working trust in the neighborhood) with three outcome variables: perceptions of incivilities, satisfaction with police, and fear of crime.

To understand these linkages we formulated a structural equation model that assesses the impact of perceptions of collective efficacy and social cohesion on the three outcome variables. In order to control for unexplained correlations between perceptions of incivilities, satisfaction with police, and fear of crime our model allows for correlations between the error terms for these outcomes and incorporates instrumental variables to allow for the estimation of these models. Additional variables are also included in the model, such as demographic characteristics and housing tenure.

The results of this model revealed a number of important findings. Generally, in the eight Miami-Dade County neighborhoods we found that the relationships between perceptions of collective efficacy, perceptions of social cohesion, and control variables showed considerable differences, which suggests that these are distinct processes of neighborhood social functioning. That is,

- Older residents perceived more collective efficacy and social cohesion than younger residents;
- Residents who used income assistance perceived lower levels of collective efficacy;
- Women perceived lower levels of social cohesion;
- Residents who owned homes had higher perceptions of social cohesion than those who were renters; and
- Residents who used neighborhood resources had higher perceptions of social cohesion.

More specifically, we found that across the eight Miami-Dade County neighborhoods:

- Perceptions of collective efficacy and perceptions of social cohesion had significant effects on incivilities. Those who had higher perceptions of collective efficacy and social cohesion had lower perceptions of incivilities, though the relationship between perceptions of social cohesion and incivilities was two times larger than those who had high perceptions of collective efficacy and low perceptions of incivilities.
- Perceptions of collective efficacy and perceptions of social cohesion had significant and nearly equivalent effects on satisfaction with police. Those who had higher perceptions of collective efficacy and higher perceptions of social cohesion had higher perceptions of satisfaction with police.

- Finally, perceptions of social cohesion had a statistically significant effect on fear of crime, while perceptions of collective efficacy did not. Those who had higher perceptions of social cohesion had lower perceptions of fear of crime.

Overview

The previous analyses revealed the possibility that perceptions of social cohesion represent a distinct construct beyond perceptions of collective efficacy.[18] The latent variable, perceptions of social cohesion, represents the shared variance among questions in the social cohesion domain that remain after controlling for its contribution to perceptions of collective efficacy. Substantively, it is unclear whether this latent variable represents a "nuisance factor" that results from common wording and linked concepts across items in the domain or rather a substantively important variable that may lead to further understanding of neighborhood social processes. As discussed by Chen et al. (2006), an advantage of the bifactor representation is that the general factors and group factors can be scored separately and included in multivariate models. In this chapter we examine the relationships between perceptions of social cohesion, perceptions of collective efficacy, and important theoretical variables.

From the resident surveys, a number of outcomes and predictor variables are available for further investigation. As discussed previously, three outcomes appear to be particularly relevant with respect to neighborhood research: *perceptions of incivilities, satisfaction with the police, and fear of crime*. Again, as discussed previously, there are reasons to suggest that perceptions of collective efficacy are related to these three outcomes based on prior research and theory. If perceptions of social cohesion reflect a nuisance dimension, it can be expected that the

[18] From this point forward, all analyses involving perceptions of collective efficacy or perceptions of social cohesion will involve scaled scores derived from the final revised collective efficacy scale.

relationships between perceptions of social cohesion and these three outcomes would be small and inconsistent after controlling for perceptions of collective efficacy and relevant control variables. On the other hand, consistent sizable and statistically significant relationships between perceptions of social cohesion and the outcome variables would suggest that perceptions of social cohesion represents an important, theoretically-relevant variable.

To test these possibilities, a structural equation model was examined using the additional variables available in the resident surveys. This structural equation model is depicted in Figure 8. The EAP scores from the bifactor model for the general factor of perceptions of collective efficacy and the group factor of social cohesion were used as variables in the structural equation models. Since the latent variable for perceptions of social cohesion was specified according to the restricted bifactor model, the resulting variables are uncorrelated. Because of this, the perceptions of social cohesion variable can be interpreted as the effects of perceptions of social cohesion after removing the effects of perceptions of collective efficacy.

In the structural equation model, three variables were included as endogenous outcome variables - perceptions of incivilities, satisfaction with the police, and fear of crime. Relationships between perceptions of collective efficacy and perceptions of social cohesion to these outcomes were examined. A number of exogenous control variables, primarily consisting of demographic and socioeconomic variables were also included in these models. These variables were related to all three outcome variables, as well as with perceptions of collective efficacy and perceptions of social cohesion. By treating perceptions of collective efficacy and social cohesion as endogenous variables, it is possible to examine their relationships with the control variables. Further, regarding the three outcome variables, it is expected that these variables will share correlations due to variables that are unmeasured in the model. This results

in correlations between the error terms for these three outcome variables, a specification that is common with "seemingly unrelated regression" or SUR models. Unfortunately, the SUR model remains unspecified without the addition of instrumental variables, *i.e.*, exogenous variables that should be related to only one of the outcome variables. The instrumental variables included were care of property (perceptions of incivilities), police visibility, poor opinion of police response to problems (satisfaction with police), and response to fear of crime (fear of crime). It is important to emphasize that the model is designed to specify static relationships between the variables of interest and no claim is made that this model represents a "causal model" of any sort. Additional details regarding the measure of these variables and the analysis are explained below.

Measures

Outcome Variables.

The first endogenous outcome variable of interest is *Perceptions of Incivilities.* An individual's perceptions of incivilities were referenced to their specific street block, rather than the neighborhood as a whole. While perceptions of incivilities have been previously found to have important impacts on fear of crime net of other neighborhood-level predicators (Wyant, 2008); some research suggests concerns about its discriminant validity (see Armstrong & Katz, 2009; Worrall, 2007).[19]

[19] An additional concern arises due to the low correlation between the perceptual measures of physical incivilities and the systematic social observation measures of physical incivilities. Ultimately, an individual's perception of the environment likely influences this individual's behavior more than the "objective" reality of the environment. For example, if fear of crime is high but the objective probability of victimization is low, it is more likely that the high fear of crime influences day-to-day behavior. Since the focus of this analysis is at the individual level, examining individual perceptions remains an important endeavor.

However, since the key variables of interest focus on perceptions, a perceptual-based measure is preferred. Perceptions of incivilities were measured using a series of nine Likert-

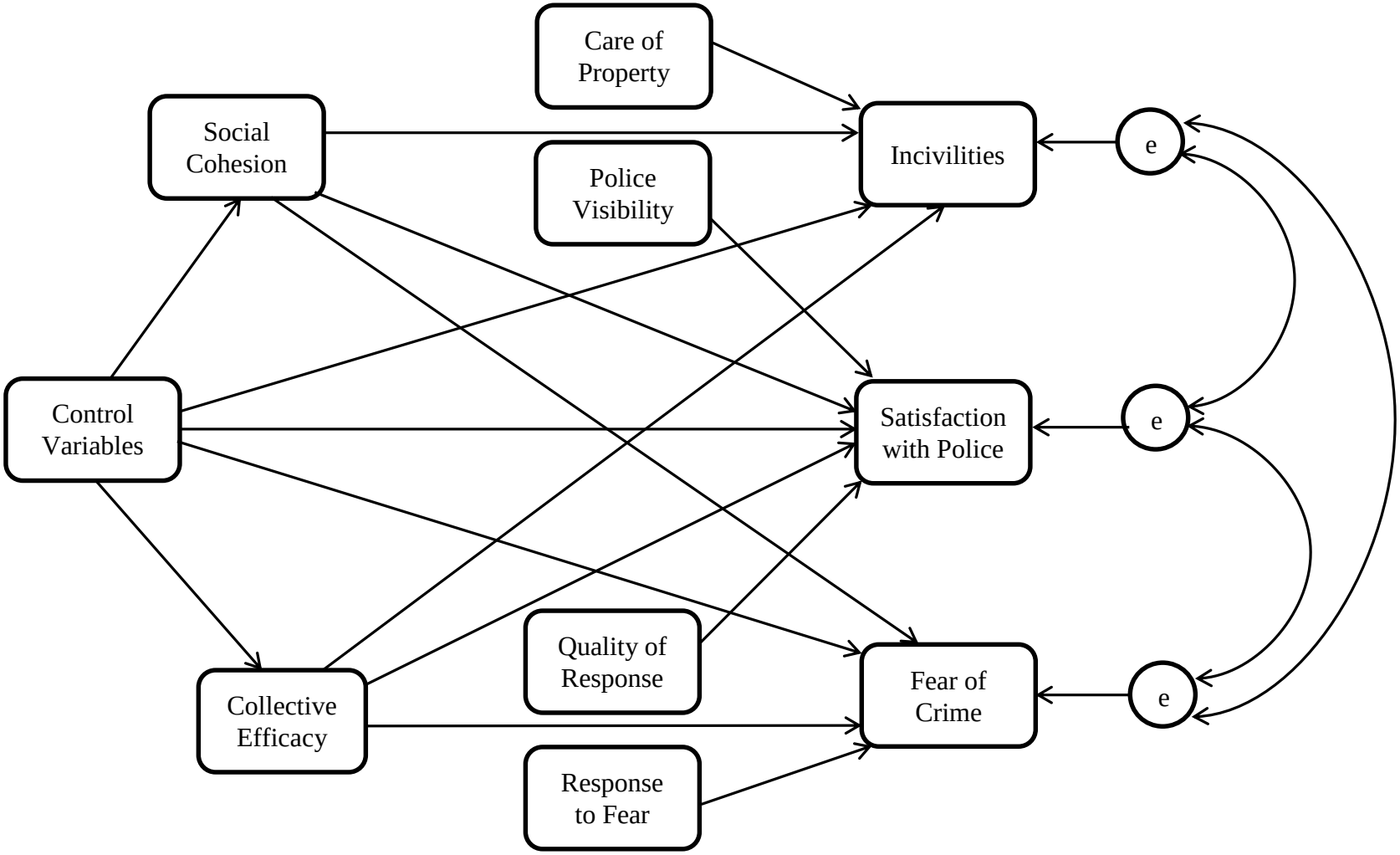


Figure 8. Structural Equation Model for Perceptions of Incivilities, Satisfaction with Police, and Fear of Crime

scaled items that asked residents about neighborhood non-crime problems spanning a range from minor to serious problems. The response scale ranges from 1 = "Not an issue/No problem" to 3 = "Big problem." The specific items in this measure include:

1. Dirty or unkempt buildings and lots
2. Vacant or abandoned lots
3. Neighbors who make too much
4. Homeless loitering
5. Vandalism [destroying property such as breaking windows of abandoned homes]
6. Public drug or alcohol use
7. Graffiti
8. Groups of young people hanging out/around
9. Truancy, that is kids not being in school when they should be

Due to possible concerns regarding this measure (and others), scores for this scale were explicitly constructed using principal axis factor analysis rather than included as a measurement component in the structural equation model. This scale showed a high level of internal consistency ($\alpha = 0.825$). Higher values on this scale indicate greater perceptions of incivilities. Means and standard deviations for all variables in the structural equation model can be found in Table 17.

The second endogenous outcome variable is *Satisfaction with the Police*. Police satisfaction was measured using a single indicator, "Overall, how satisfied are you with the quality of police services in your neighborhood?" Responses were coded on a Likert-scale that ranged from 1 = "Very dissatisfied" to 5 = "Very satisfied." The item mean was 3.97, suggesting a relatively high level of satisfaction with the police across the sample.[20]

[20] While this variable is ordinal, it was treated as continuous in the structural equation model for the purpose of maintaining a parsimonious model. As such, some bias in coefficients is anticipated, but this bias should not substantially influence the ability to draw substantive conclusions about the relationships between these variables. A better measure of satisfaction with the police is recommended for future research.

The third endogenous outcome variable is *Fear of Crime*. Fear of crime is composed of four Likert-scale indicators that measured respondents' sense of worry or fear of victimization of specific types of crime occurring within the neighborhood of residence. Specifically, respondents were asked how much they worry about:

1. Someone will try to break into your home while no one is here
2. Someone will try to steal things that you might leave outside your home overnight
3. Someone will try to rob you or steal something from you while you are outside in this neighborhood
4. Someone will try to attack you or beat you up while you are outside in this neighborhood

Response categories ranged from 1 = "Not worried" to 3 = "Very worried." Principal axis factor analysis resulted in a one factor solution with high internal consistency ($\alpha = 0.913$). Higher values on this scale indicate higher levels of fear of crime.

Instrumental Variables

For perception of incivilities, the instrumental variable *care of property* was included in the model. It was suspected that individuals that perceived high levels of incivilities in the neighborhood will be less likely to spend time and energy performing property upkeep activities as these activities would be seen as having little economic or social benefit in areas besieged by incivilities. Further, high perceived incivilities may suggest that individuals perceived efforts at property upkeep may be quickly undone by vandalism, littering, or other destructive behaviors. Care of property was measured using two items: "Do you fix items on your house that have cracked or broken off?" and "Do you mow your lawn or place flowers or decorative items outside your property?" The number of 'yes' responses were summed to create this index.

Two instrumental variables were used in the equation for satisfaction with police: *police visibility* and *quality of police response*. Police visibility was measured with a single item, "On a normal day, how likely is it that you will see a police officer in your neighborhood?" Responses

were based on a five-category Likert scale ranging from very unlikely to very likely. Quality of police response to problems was assessed using a single item that asked to what degree poor police response to problems was a problem on the resident's block. Responses were given on a four response category metric ranging from 'Not an Issue' to 'Big Problem.' Higher numbers on this item indicate lower quality of police response to problems.

The final instrumental variable included in the equation for fear of crime is the *response to fear*. While the response to fear is an outcome specifically tied to fear of crime, it is used in this model as an instrumental variable. Again, it is important to emphasize that the direction of this relationship is not assumed to be causal, but rather the response to fear is simply a useful instrumental variable that allows for model identification. Two variables were used to measure the severity of response to fear of crime: "Whether or not fear of crime has caused you to limit the places that you will go by yourself" and "Whether or not fear of crime has caused you to plan to move to a different place to live." The yes/no responses to these questions were averaged and included in the structural equation model.[21]

Control Variables.

A number of socio-demographic control variables were included in the analyses. *Sex* was a dichotomous variable capturing the self-identified sex of the respondent; females were coded with a value of one.[22] Race/ethnicity was transformed into a dichotomous variable measuring self-identified Black or African-American race and a dichotomous variable measuring self-

[21] Additional questions regarding purchasing a weapon for self-defense and installing security devices on residence were considered but demonstrated low correlations with fear of crime and were eliminated.

[22] This question asked for self-identified biological sex, rather than a measure of socially defined gender.

Table 17. Descriptive Statistics for Full Sample for Variables in Structural Equation Model

Variable	Valid N	Minimum	Maximum	Mean	SD
Percep. Incivilities	1227	-3.048	5.186	0.000	1.000
Satisfaction w Police	1227	1.000	5.000	3.966	0.841
Fear of Crime	1225	-0.793	2.382	0.000	1.000
Percep. Collective Efficacy	1210	-3.044	2.435	0.000	0.950
Percept of Social Cohesion	1210	-3.553	3.314	0.000	0.917
Sex	1227	0.000	1.000	0.587	0.493
Hispanic	1218	0.000	1.000	0.581	0.494
Black	1218	0.000	1.000	0.223	0.417
Age	1161	18.000	90.000	49.031	17.086
Residence Length	1214	0.083	57.000	10.718	11.568
Employment	1218	0.000	1.000	0.553	0.497
High School Grad/GED	1224	0.000	1.000	0.292	0.455
Some College	1224	0.000	1.000	0.560	0.497
Home Ownership	1214	0.000	1.000	0.512	0.500
Income Assistance	1205	0.000	1.000	0.300	0.459
Use of Neigh. Resources	1226	1.000	4.000	2.307	0.558
Property Care	1218	0.000	2.000	1.434	0.839
Police Visibility	1227	1.000	5.000	3.760	1.210
Police Quality of Response	1227	1.000	4.000	2.031	0.524
Response to Fear	1226	0.000	1.000	0.259	0.327

identified Hispanic or Latino ancestry. Non-Hispanic other race (mostly non-Hispanic White) was left as the reference category.[23] *Age* in years was included as a continuous variable. Respondents' *employment status* was included as a dichotomous indicator with the explicit category of currently employed full or part-time. Education was measured using dichotomous variables that included *high school/GED* and *some college or more.* Less than high school education was used as the reference category.

Residence length was operationalized as the number of years our respondents reported living at their current address. *Home ownership* was also included in the analysis as respondents were asked "Do you own or rent your home?" *Income assistance* was measured with an indicator of household involvement in income assistance programs. Respondents were asked, "Do you or anyone in your household receive benefits such as food stamps or TANF?" Responses were coded on a dichotomous scale where "1" represents participation in an income assistance program.

The analyses also included a variable that measures the extent to which respondents *Used Neighborhood Resources* such as parks and community centers. This concept was measured with a seven Likert-scale item that asked respondents how often they utilized a series of specific neighborhood assets:

1. Visit the local neighborhood library
2. Attend a church service in your neighborhood
3. Visit local neighborhood parks
4. Visit other local neighborhood community centers
5. Go to local neighborhood grocery stores
6. Use medical services located in the neighborhood
7. Use public transportation near my neighborhood

[23] Although it was possible for respondents to identify as both Black and Hispanic, there was very little overlap between these designations.

Response categories ranged from 1 = "Never" to 4 = "Often." A composite score was computed by averaging these measures for each respondent. There is very little prior research on this measure, but it is expected that neighborhood resource utilization creates a greater social and economic investment the neighborhood by the resident (see Swatt et al., 2013). In addition, Brantingham and Brantingham (1999) argue that those who frequent neighborhood establishments have a larger awareness space.

Plan of Analysis

Structural equation models were estimated in Stata 12.0 using the newly introduced SEM capabilities (StataCorp, 2011). Following standard practices, all exogenous variables were assumed to have free correlations with each other. Endogenous variables were assumed to be correlated with exogenous and other endogenous variables only through the pathways explicitly indicated in Figure 8. To adjust for the fact that responses from individuals living in the same neighborhood are more similar than individuals living in separate neighborhoods, robust standard errors were estimated by including clustering effects defined by neighborhood of residence.

Two strategies were used to address missing data. For missing data from multiple-item scale variables (perceptions of incivilities, fear of crime, and use of neighborhood resources) missingness that resulted from incomplete response to all items in the scale was addressed by substituting the scale mean from the remaining items. The benefit of this approach is that information from the partial response to items in the scale was used to impute values consistent with the remaining items on the scale. This was done prior to the creation of the scale variables. As Schafer and Graham (2002) suggest, this approach is commonly used with scale items and likely results in little bias and minimal underestimation of standard errors for the composite scale

variables.[24] For non-scale variables or scale variables with no response to items in the scale, missingness was addressed within the procedure used to estimate the structural equation model. Specifically, Stata 12 allows for the use of Maximum Likelihood with Missing Values (MLMV) estimation which assumes that missing data are Missing at Random (MAR), that is that missingness is a function of the observed values of variables in the dataset. This strategy provides for unbiased estimates for parameters, as long as missingness can be assumed MAR.[25]

Results

The results of the structural equation model are presented in Table 18. Equation level goodness of fit statistics based on the coefficient of determination (or R^2) were obtained for each endogenous variable and for the model as a whole (see StataCorp, 2011). The overall model fit was good (R^2 = 0.484), but the fit for each of the endogenous variables was substantially lower (R^2 = .063 for perception of collective efficacy; R^2 = .057 for perception of social cohesion; R^2 = 0.108 for perceptions of incivilities; R^2 = 0.215 for satisfaction with police; and R^2 = 0.274 for fear of crime). Unstandardized coefficients and standard errors are presented in columns corresponding to each endogenous variable.

The results for the perceptions of collective efficacy and perceptions of social cohesion lent support to the argument that these variables represent distinct neighborhood processes as

[24] This approach was not used for the creation of EAP scores for perceptions of collective efficacy or perceptions of social cohesion. Respondents with missing items were not imputed and were instead treated as missing.

[25] Unfortunately, because missingness is observed in the exogenous variables as well as the endogenous variables, there is an additional assumption of multivariate normality for the exogenous variables. This may lead to additional bias in estimates. However, since the amount of missing data is small, it is expected that the extent of bias is likely less than assuming that the data are Missing Completely at Random (MCAR) as would be the case with listwise deletion.

there were important differences in the relationships between these variables and the exogenous variables. Age carried a significant coefficient for both variables suggesting that older residents perceived more collective efficacy and social cohesion. Income assistance only carried a significant relationship with perceptions of collective efficacy as respondents using income assistance perceived lower levels of collective efficacy. Sex only had a significant relationship with perceptions of social cohesion, as females perceived lower levels of social cohesion. Home ownership had a significant relationship with perceptions of social cohesion and homeowners generally perceived higher levels of social cohesion. Finally, use of neighborhood resources only carried a significant relationship with perceptions of social cohesion as individuals reporting greater use of neighborhood resources also perceived higher levels of social cohesion.

Regarding the results for perceptions of incivilities, both perceptions of collective efficacy and perceptions of social cohesion were statistically significant. Higher perceptions of collective efficacy and higher perceptions of social cohesion were associated with lower perceptions of incivilities. Since both variables were measured on a common metric (mean of zero and standard deviation of one), we compared the strength of the relationship by examining the relative size of the coefficients. The relationship between perceptions of incivilities and perceptions of social cohesion was over twice as strong as the relationship between perceptions of incivilities and perceptions of collective efficacy. Several additional exogenous variables carried significant relationships with perceptions of collective efficacy. Younger respondents perceived significantly lower levels of incivilities. Residents with longer tenures at their current address perceived significantly higher levels of incivilities. High school graduates perceived lower levels of incivilities compared to respondents with less than a high school education.

Finally, individuals who more frequently use neighborhood resources perceived higher levels of incivilities.

Table 18. Results for Full Structural Equation Model

	Perceptions of Collective Efficacy		Perceptions of Social Cohesion		Perceptions of Incivilities		Satisfaction with Police		Fear of Crime	
Variable	b	SE	b	SE	b	SE	b	SE	b	SE
Percep. Collective Efficacy	--	--	--	--	-0.113***	(0.031)	0.100**	(0.035)	-0.089	(0.057)
Percept of Social Cohesion	--	--	--	--	-0.284***	(0.072)	0.097*	(0.044)	-0.160*	(0.068)
Sex	0.012	(0.080)	-0.158*	(0.067)	-0.004	(0.030)	0.061°	(0.034)	0.019	(0.067)
Hispanic	-0.088	(0.116)	-0.022	(0.111)	0.010	(0.120)	0.025	(0.070)	0.316***	(0.090)
Black	-0.256°	(0.136)	-0.167	(0.194)	-0.306	(0.224)	-0.136	(0.245)	-0.123	(0.156)
Age	0.005*	(0.002)	0.004*	(0.002)	-0.004*	(0.002)	0.005***	(0.001)	0.001	(0.002)
Residence Length	-0.002	(0.004)	-0.002	(0.002)	0.007*	(0.003)	-0.002	(0.002)	0.002	(0.002)
Employment	0.012	(0.071)	-0.104°	(0.059)	0.034	(0.090)	0.053	(0.060)	0.025	(0.048)
High School Grad/GED	0.049	(0.064)	-0.088	(0.154)	-0.225*	(0.091)	0.075	(0.063)	-0.059	(0.057)
Some College	0.185°	(0.108)	-0.034	(0.161)	-0.093	(0.094)	0.070	(0.070)	0.086	(0.057)
Home Ownership	0.131	(0.106)	0.252***	(0.078)	-0.019	(0.087)	-0.051	(0.076)	-0.023	(0.098)
Income Assistance	-0.256*	(0.111)	-0.036	(0.041)	0.018	(0.090)	-0.129	(0.084)	0.174°	(0.093)
Use of Neigh. Resources	0.093	(0.074)	0.209**	(0.079)	0.198***	(0.028)	-0.006	(0.074)	0.181°	(0.108)
Property Care	--	--	--	--	-0.043	(0.037)	--	--	--	--
Police Visibility	--	--	--	--	--	--	0.197***	(0.062)	--	--
Police Quality of Response	--	--	--	--	--	--	-0.395***	(0.105)	--	--
Response to Fear	--	--	--	--	--	--	--	--	1.073***	(0.119)
Constant	-0.469*	(0.223)	-0.518°	(0.265)	-0.126	(0.157)	3.754***	(0.306)	-1.002***	(0.136)
Model R^2	0.063		0.057		0.108		0.215		0.274	
COV(e_1 , e_2)	0.061	(0.061)								
COV(e_1 , e_3)	0.128***	(0.029)								
COV(e_2 , e_3)	-0.038	(0.035)								
Full Model R^2	0.484									

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Similarly, both perceptions of collective efficacy and perceptions of social cohesion carried significant relationships with satisfaction with the police. Unlike the results for perceptions of incivilities, the magnitude of the relationships for these variables and satisfaction with the police were nearly equal. Only three other variables were statistically significant in this equation. Older respondents reported significantly higher levels of satisfaction with the police. Residents who reported higher levels of police visibility were significantly more satisfied with the police. Respondents who reported higher levels of dissatisfaction with police response to problems also reported lower levels of satisfaction with the police.

We observed interesting results for the equation for fear of crime. Perceptions of social cohesion had a statistically significant, negative relationship with fear of crime, suggesting that individuals that perceived higher levels of social cohesion had lower levels of fear of crime. The relationship between perceptions of collective efficacy and fear of crime was not statistically significant. Only two additional variables carried significant relationships with fear of crime. Hispanic/Latino residents reported higher levels of fear of crime. Not surprisingly, the relationship between fear of crime and response to fear of crime was also statistically significant.

Conclusions

The preceding analyses sought to examine whether perceptions of social cohesion should be considered a substantively important dimension of neighborhood function net of its contribution to perceptions of collective efficacy. The results suggest that this variable represents an important construct in its own right, rather than merely a nuisance factor resulting from commonalities between questions from a common domain. Perceptions of collective efficacy and perceptions of social cohesion each demonstrated unique patterns of relationships with the exogenous control variables in the structural equation model. Age was the only exogenous

variable that carried a significant relationship with both variables. Income assistance was only significant in the model for perceptions of collective efficacy. Home ownership and use of neighborhood resources was only significant for perceptions of social cohesion. This surprising pattern of relationships appears to suggest that perceptions of collective efficacy and perceptions of social cohesion are distinct constructs.

Similarly, the relationships of perceptions of collective efficacy and perceptions of social cohesion with the outcome variables also suggested that these constructs are distinct variables. As previously discussed, if perceptions of social cohesion was a nuisance variable, it would be expected to show non-significant relationships with the outcome variables once perceptions of collective efficacy was included in the models. Further, any significant effects should be much lower in magnitude compared to the effects of perceptions of collective efficacy. These patterns were not observed in the results of the structural equation models. Both variables carried significant relationships with perceptions of incivilities in a multivariate model, but the magnitude of the effect for perceptions of social cohesion was over twice as large as the effect for perceptions of collective efficacy. Both variables were also significant in the equation for satisfaction with the police with nearly equal magnitudes of effects. Finally, perceptions of social cohesion had a significant relationship with fear of crime, while perceptions of collective efficacy did not. Again, these results suggest that perceptions of social cohesion may remain a substantively important construct to explore even net of its influence on perceptions of collective efficacy.

It is important to emphasize that these analyses only examined the relationships between variables operationalized at the level of individual perceptions. Due to the limited number of neighborhoods in the current sample, it is not possible to aggregate the perceptions of collective

efficacy and perceptions of social cohesion variables to the neighborhood level and consider their relative contribution to understanding neighborhood dynamics with crime. This remains a vital area for further exploration. While perceptions of social cohesion may be important for understanding individual residents' perceptions, an aggregate measure of social cohesion within a neighborhood may offer little explanatory power beyond the aggregate measure of collective efficacy. Future research should examine whether the aggregate measure of social cohesion is distinct from collective efficacy at the neighborhood level of analysis.

CHAPTER V. ASSESSING HETEROGENEITY IN PERCEPTIONS OF COLLECTIVE EFFICACY AND SOCIAL COHESION ACROSS NEIGHBORHOODS

Abstract

In this chapter we examine the relationships between perceptions of collective efficacy, perceptions of social cohesion, and the three outcomes of perceptions of incivilities, satisfaction with the police, and fear of crime across the eight Miami-Dade neighborhoods. We considered whether the observed relationships between these variables differ (in magnitude or significance) between neighborhoods. We assessed the heterogeneity in these relationships using the structural equation model identified in the previous section and obtained separate models for each neighborhood. We identified the substantive relationships that show differences between neighborhoods.

The results indicated that a number of important relationships showed heterogeneity across the eight neighborhoods in our sample.

- Overall, the relationship between perceptions of collective efficacy and perceptions of incivilities *did not differ* between neighborhoods. However, the relationship between perceptions of social cohesion and perceptions of incivilities appeared to *differ* between neighborhoods.
    - In Seminole Wayside Park, East Little Havana, Auberdale, and Ives Dairy Estates, residents with high perceptions of social cohesion (sense of working trust in the community) had low perceptions of incivilities (litter, disorder, graffiti, etc.)

- There did not appear to be any heterogeneity in the relationships between perceptions of collective efficacy and social cohesion and satisfaction with police.

- The relationships between perceptions of collective efficacy and social cohesion with fear of crime both demonstrate considerable differences across neighborhoods. The patterns of observed differences provide clues for possible moderating variables at the neighborhood level.
    - In Coral Reef Park, Ives Dairy Estates, and Kendall Hammocks Park residents had high collective efficacy and low fear of crime. In the predominantly African American neighborhoods of Brownsville and Bunche Park and the predominantly Hispanic neighborhoods of East Little Havana, and Auberdale, however, collective efficacy has no influence on fear of crime. In Seminole Wayside Park, residents had high collective efficacy and unpredictably, had high fear of crime.

    - In Brownsville, Seminole Wayside Park, and East Little Havana, residents with high perceptions of social cohesion had low fear of crime.

Overview

In this chapter, we consider whether the relationships between perceptions of collective efficacy, perceptions of social cohesion, and the three outcome variables (perceptions of incivilities, satisfaction with the police, and fear of crime) remain consistent when comparing results between neighborhoods. In a recent publication, Swatt et al. (2013) found that perceptions of collective efficacy demonstrates substantial heterogeneity in its effects on perceptions of incivilities and fear of crime between four of the eight neighborhoods used in the current research (Brownsville, Bunche Park, East Little Havana, and Seminole Wayside Park). Specifically, the relationship between perceptions of collective efficacy and perceptions of incivilities and the relationship between perceptions of incivilities and fear of crime were consistent with theoretical expectations and had consistent magnitudes across neighborhoods. However, substantial heterogeneity was observed in the relationship between perceptions of collective efficacy and fear of crime between neighborhoods. This relationship was statistically significant for only two neighborhoods (Brownsville and Bunche Park). As argued by Swatt et al. (2013) this suggests that the relationship between perceptions of collective efficacy and fear of crime may be moderated by important neighborhood-level variables.

There are, however, a number of important limitations to that study that are particularly relevant to the current research effort. First, the previous study by Swatt et al. (2013) only examined four of the neighborhoods under investigation (namely the neighborhoods selected by The Children's Trust). It remains to be seen whether similar results are found when examining the full eight neighborhoods used in the current research. Second, this research only considered perceptions of collective efficacy as measured by a composite scale for the total 29 items in the

extended scale rather than separating the scale into distinct dimensions for perceptions of collective efficacy and perceptions of social cohesion. Findings discussed in Chapter II indicate that this measure is problematic as the factor scale represents a composite measure of perceptions of collective efficacy and the group dimension for perceptions of social cohesion. It is unclear whether the observed heterogeneity represents heterogeneity in the relationship between perceptions of collective efficacy and fear of crime or perceptions of social cohesion and fear of crime, or both. Finally, as noted by Swatt et al. (2013) there are concerns with endogeneity in the structural equation models that were estimated. While it is impossible to address all of the concerns of endogeneity due to reciprocal effects and the use of cross-sectional data, the use of instrumental variables should address some of the concerns.

These limitations suggest that it is worthwhile to replicate and expand the results of Swatt et al. (2013) to address these outstanding issues. Further, by uncovering more detail about perceptions of social cohesion and its relationships with other key variables, between neighborhood comparisons may be enlightening as they may suggest potential moderating influences on the relationships between this variable and the outcome variables. Finally, satisfaction with the police was not previously examined by Swatt et al. (2013) and examining potential heterogeneity in the relationships between perceptions of collective efficacy, perceptions of social cohesion, and satisfaction with the police remains an important extension of the previous research effort.

Measurement and Plan of Analysis

In order to examine whether the relationships between outcome variables and collective efficacy and social cohesion differ between neighborhoods, the structural equation model presented in Figure 8 was examined for each neighborhood separately. The measurement of the variables in the model remained the same as presented previously. The specification of the structural model also remains largely unchanged.

We acknowledge three important differences between the analyses examined in the previous chapter and the analyses examined in this chapter. First, based on the demographics of the survey respondents, there was insufficient variability in African-American respondents in some neighborhoods. The proportion of respondents self-identifying their race as African-American was low in Seminole Wayside Park, East Little Havana, Auberdale, Coral Reef Park, and lowest in Kendal Hammocks Park with no African-American respondents. Therefore, this variable was removed from the model. The dichotomous indicator for Hispanic/Latino ancestry remained the only race/ethnicity identifier in the model. Second, because models were estimated for each neighborhood separately, there was no need to correct for clustering of respondents within neighborhoods. Therefore, the cluster-adjusted standard errors used in the previous model were not used in the current analyses. Third, the invariance test offered by Stata 12.0 (see StataCorp, 2011) provided a method for testing the constraint that model parameters were equivalent across neighborhoods. This invariance test provided a strategy for determining whether apparent differences in model parameters between neighborhoods represent statistically significant differences rather than chance variation in the size of the coefficients between neighborhoods.

Results

Descriptive statistics for each neighborhood for each of the variables used in the model are presented in Table 19. Along with the mean and standard deviation of each variable, either the Kruskal-Wallis or two-way Chi-Square tests for significant differences are presented. Kruskal-Wallis tests were used for continuous variables and Chi-Square tests were used for dichotomous variables. We found significant initial differences between neighborhoods for nearly all of these variables (with the exception of sex as the sex ratio in each neighborhood was similar). This result was not particularly surprising as these neighborhoods were selected to represent a cross-section of neighborhoods across Miami-Dade County. As such, finding initial differences between neighborhoods for outcome and control variables was an expected consequence of the heterogeneity between these neighborhoods.

The results from the structural equation models for each of the neighborhoods are presented in Table 20. Due to the sheer number of parameters in these models, these results are presented across five sub-tables: Table 20A, Table 20B, Table 20C, Table 20D, and Table 20E are separated according to each endogenous variable. Results for each neighborhood are presented in each of the columns with the final column in each table presenting the results of the group invariance test.

The results for the first endogenous variable, perceptions of collective efficacy, are presented in Table 20A. The explained variance differed considerably across neighborhoods from a low of 3.4% in Auberdale to a high of 20.5% in Ives Dairy Estates. There appeared to be little consistency in the relationships between control variables and perceptions of collective efficacy across neighborhoods. Females reported significantly higher perceptions of collective

efficacy in East Little Havana, but significantly lower perceptions of collective efficacy in Kendall Hammocks Park. Employed residents reported significantly higher perceptions of collective efficacy in Bunche Park, but significantly lower perceptions of collective efficacy in Ives Dairy Estates. Residents using income assistance reported lower levels of perceptions of collective efficacy in East Little Havana and Kendall Hammocks Park. Residents of Coral Reef Park who used neighborhood resources more often reported significantly higher perceptions of collective efficacy. Finally, home ownership was associated with significantly higher perceptions of collective efficacy in Bunche Park and Ives Dairy Estates, but significantly lower perceptions of collective efficacy only in East Little Havana. This relationship was the only one associated with a significant value for the invariance test.

The results for the second endogenous variable, perceptions of social cohesion, are reported in Table 20B. There was considerably less variability in the explained variance in this endogenous variable, ranging from a high of 17.0% in Bunche Park to a low of 4.6% in Auberdale (which appears abnormally low). Female residents of Coral Reef Park reported significantly lower levels of perceptions of social cohesion, and the invariance test indicated that this coefficient differed between neighborhoods. Hispanic residents reported significantly lower perceptions of social cohesion in East Little Havana, which is surprising, but the invariance test only approached statistical significance. This may indicate that the significant relationship for East Little Havana only represented chance variation. Residents completing at least some college report significantly higher perceptions of social cohesion in Brownsville, but significantly lower levels of perceptions of social cohesion in East Little Havana. The invariance test was statistically significant, suggesting that the observed differences in these coefficients represented actual heterogeneity between neighborhoods as opposed to chance variation.

Table 19. Descriptive Statistics for Each Neighborhood

Variable	Brownsville Mean	Brownsville SD	Bunche Park Mean	Bunche Park SD	Seminole Wayside Park Mean	Seminole Wayside Park SD	East Little Havana Mean	East Little Havana SD	Auberdale Mean	Auberdale SD	Coral Reef Park Mean	Coral Reef Park SD	Ives Dairy Estates Mean	Ives Dairy Estates SD	Kendall Hammocks Park Mean	Kendall Hammocks Park SD	Kruskal - Wallis
Percep. Incivilities	-0.670	1.217	0.222	1.141	0.095	1.019	0.447	1.190	-0.184	0.739	-0.191	0.534	0.303	0.952	-0.122	0.721	118.866***
Satisfaction w Police	3.521	0.984	4.104	1.009	3.957	0.756	4.025	0.711	3.866	0.930	4.249	0.605	3.812	0.899	4.086	0.644	75.915***
Fear of Crime	-0.675	0.459	-0.174	0.616	0.156	0.972	0.848	1.157	0.342	1.100	-0.518	0.569	0.014	1.016	-0.163	0.894	225.236***
Percep. Collective Efficacy	-0.355	0.611	-0.132	0.792	-0.246	0.743	-0.268	1.004	0.025	0.894	0.686	0.822	0.140	1.064	-0.001	1.076	143.913***
Percept of Social Cohesion	0.228	0.730	-0.453	0.684	0.062	0.902	-0.037	1.108	0.126	0.907	0.339	0.954	-0.190	0.831	-0.148	0.853	87.199***
Sex[1]	0.570	0.497	0.637	0.483	0.534	0.500	0.648	0.479	0.591	0.493	0.568	0.497	0.610	0.489	0.543	0.500	7.757
Hispanic[1]	0.100	0.301	0.085	0.279	0.755	0.432	0.975	0.157	0.976	0.155	0.414	0.494	0.275	0.448	0.844	0.364	595.858***
Black[1]	0.850	0.359	0.854	0.355	0.080	0.272	0.013	0.112	0.006	0.078	0.030	0.170	0.248	0.433	0.000	0.000	757.517***
Age	45.341	16.657	45.732	12.207	47.834	17.619	49.667	18.793	53.184	17.749	53.259	16.452	45.039	15.039	49.445	18.409	33.407***
Residence Length	13.998	14.155	16.887	12.963	9.795	10.188	4.800	5.898	11.329	12.829	13.561	12.513	11.225	11.296	6.035	6.194	140.916***
Employment[1]	0.417	0.495	0.714	0.453	0.472	0.501	0.434	0.497	0.500	0.502	0.637	0.482	0.675	0.470	0.562	0.498	51.960***
High School Grad/GED[1]	0.622	0.487	0.470	0.501	0.356	0.480	0.094	0.293	0.372	0.485	0.101	0.302	0.214	0.412	0.228	0.421	158.992***
Some College[1]	0.269	0.445	0.388	0.489	0.405	0.492	0.604	0.491	0.451	0.499	0.864	0.344	0.721	0.450	0.673	0.471	169.936***
Home Ownership[1]	0.610	0.487	0.656	0.477	0.577	0.496	0.107	0.310	0.372	0.485	0.720	0.450	0.717	0.452	0.395	0.490	198.859***
Income Assistance[1]	0.378	0.487	0.175	0.381	0.403	0.492	0.604	0.491	0.390	0.489	0.024	0.154	0.132	0.339	0.294	0.457	177.674***
Use of Neigh. Resources	2.387	0.426	2.057	0.533	2.348	0.566	2.543	0.573	2.107	0.523	2.413	0.495	2.215	0.559	2.362	0.592	86.672***
Property Care	1.575	0.796	1.526	0.831	1.739	0.587	0.786	0.806	1.622	0.720	1.828	0.512	1.209	0.943	1.195	0.924	205.462***
Police Visibility	4.405	0.600	3.926	1.226	3.521	1.259	4.340	0.786	3.579	1.306	3.651	1.196	3.539	1.253	3.321	1.308	119.697***
Police Response to Problems	1.843	0.548	2.281	0.719	2.049	0.553	1.893	0.580	2.000	0.429	2.036	0.343	2.117	0.548	2.025	0.314	73.314***
Response to Fear	0.136	0.289	0.133	0.281	0.304	0.326	0.497	0.349	0.348	0.315	0.127	0.232	0.237	0.334	0.248	0.296	173.987***

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

1. Dichotomous item, Pearson's Chi-Square presented

Home ownership was associated with significantly higher perceptions of social cohesion in East Little Havana and Ives Dairy Estates. Residents employing income assistance in Coral Reef Park reported significantly higher perceptions of social cohesion, but this result was likely a consequence of the small number of residents using such assistance. Use of neighborhood resources was associated with significantly higher perceptions of social cohesion only in Bunche Park, Coral Reef Park, and Ives Dairy Estates. The invariance test was statistically significant, suggesting that the heterogeneity in the coefficients for this variable represented real differences between neighborhoods.

The results for the first outcome variable, perceptions of incivilities are presented in Table 20C. There were considerable observed differences in the explained variance in perceptions of incivilities between the models, ranging from 36.8% in Brownsville to 9.2% in Kendall Hammocks Park. Higher perceptions of collective efficacy were associated with significantly lower perceptions of incivilities in Brownsville and Ives Dairy Estates. This relationship only approached statistical significance for East Little Havana and Auberdale. Perceptions of collective efficacy appeared to have no effect on perceptions of incivilities in Bunche Park, Seminole Wayside Park, Coral Reef Park, and Kendall Hammocks Park. The invariance test was not statistically significant, which would suggest that there was a fairly consistent slight negative relationship between these variables across neighborhoods. Higher perceptions of social cohesion were significantly associated with lower perceptions of incivilities in Seminole Wayside Park, East Little Havana, Auberdale, and Ives Dairy Estates. This relationship approached statistical significance in Brownsville, Bunche Park, and Coral Reef Park. There appeared to be no relationship between perceptions of social cohesion and

Table 20A. Structural Equation Model Results by Neighborhood - Perceptions of Collective Efficacy

Variable	Brownsville b	SE	Bunche Park b	SE	Seminole Wayside Park b	SE	East Little Havana b	SE	Auberdale b	SE	Coral Reef Park b	SE	Ives Dairy Estates b	SE	Kendall Hammocks Park b	SE	Invariance Test
Sex	-0.130	(0.124)	-0.098	(0.144)	0.070	(0.121)	0.382*	(0.161)	0.014	(0.148)	0.028	(0.124)	-0.005	(0.166)	-0.336*	(0.167)	11.602
Hispanic	0.161	(0.206)	-0.285	(0.262)	0.097	(0.138)	-0.010	(0.474)	0.009	(0.458)	0.119	(0.141)	0.092	(0.179)	0.448°	(0.231)	4.590
Age	-0.001	(0.005)	0.007	(0.007)	0.004	(0.004)	0.009°	(0.005)	0.005	(0.005)	0.009°	(0.005)	-0.001	(0.007)	0.000	(0.005)	4.262
Residence Length	-0.001	(0.005)	-0.007	(0.007)	0.008	(0.008)	-0.001	(0.012)	-0.009	(0.008)	-0.010	(0.007)	0.010	(0.010)	0.004	(0.016)	6.197
Employment	-0.079	(0.126)	0.388*	(0.175)	0.121	(0.134)	-0.093	(0.173)	0.054	(0.168)	-0.147	(0.142)	-0.384*	(0.185)	0.020	(0.190)	11.812
High School Grad/GED	0.018	(0.192)	0.155	(0.232)	0.053	(0.153)	0.236	(0.282)	-0.213	(0.210)	0.398	(0.371)	0.306	(0.358)	-0.246	(0.313)	4.520
Some College	0.119	(0.204)	0.153	(0.258)	0.209	(0.154)	-0.237	(0.165)	-0.318	(0.214)	0.133	(0.339)	0.549°	(0.330)	-0.248	(0.293)	10.416
Home Ownership	0.131	(0.159)	0.346*	(0.166)	-0.151	(0.145)	-1.106***	(0.242)	0.131	(0.178)	0.236	(0.170)	0.733***	(0.216)	0.044	(0.199)	39.225***
Income Assistance	-0.017	(0.157)	-0.056	(0.181)	-0.008	(0.145)	-0.401*	(0.163)	-0.016	(0.150)	-0.015	(0.419)	-0.134	(0.247)	-0.538**	(0.198)	9.019
Use of Neigh. Resources	0.013	(0.141)	0.036	(0.134)	0.069	(0.111)	0.042	(0.139)	0.186	(0.138)	0.466***	(0.133)	0.085	(0.146)	-0.051	(0.140)	9.971
Constant	-0.363	(0.481)	-0.958°	(0.523)	-0.853*	(0.385)	-0.518	(0.735)	-0.411	(0.648)	-1.076*	(0.548)	-0.854°	(0.491)	0.251	(0.569)	4.435
Model R^2	0.040		0.116		0.041		0.187		0.034		0.127		0.205		0.097		

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Table 20B. Structural Equation Model Results by Neighborhood - Perceptions of Social Cohesion

Variable	Brownsville b	SE	Bunche Park b	SE	Seminole Wayside Park b	SE	East Little Havana b	SE	Auberdale b	SE	Coral Reef Park b	SE	Ives Dairy Estates b	SE	Kendall Hammocks Park b	SE	Invariance Test
Sex	-0.105	(0.139)	0.147	(0.120)	-0.280°	(0.145)	-0.342°	(0.180)	0.195	(0.150)	-0.324*	(0.141)	-0.141	(0.135)	-0.141	(0.133)	14.725*
Hispanic	0.387°	(0.230)	0.348	(0.219)	-0.048	(0.164)	-1.138*	(0.530)	0.135	(0.462)	-0.129	(0.160)	-0.156	(0.145)	0.111	(0.183)	12.296°
Age	-0.008	(0.005)	-0.007	(0.006)	-0.001	(0.005)	0.007	(0.005)	-0.000	(0.005)	0.008	(0.006)	0.004	(0.006)	0.006	(0.004)	9.618
Residence Length	0.001	(0.005)	0.005	(0.006)	0.007	(0.009)	0.014	(0.014)	0.004	(0.008)	-0.006	(0.007)	-0.012	(0.008)	-0.004	(0.012)	5.939
Employment	-0.187	(0.142)	0.048	(0.145)	-0.096	(0.160)	-0.043	(0.194)	0.102	(0.170)	-0.214	(0.161)	-0.250°	(0.151)	-0.116	(0.151)	4.422
High School Grad/GED	0.410°	(0.215)	0.197	(0.189)	0.002	(0.183)	-0.530°	(0.315)	-0.007	(0.212)	0.001	(0.421)	-0.137	(0.291)	0.057	(0.248)	7.357
Some College	0.572*	(0.228)	0.266	(0.211)	-0.163	(0.184)	-0.450*	(0.185)	-0.014	(0.216)	0.540	(0.383)	-0.046	(0.268)	0.354	(0.233)	18.523**
Home Ownership	0.197	(0.179)	-0.004	(0.144)	0.243	(0.173)	0.698**	(0.271)	-0.030	(0.179)	-0.037	(0.189)	0.479**	(0.174)	0.280°	(0.158)	11.473
Income Assistance	-0.198	(0.175)	-0.107	(0.151)	-0.107	(0.172)	0.100	(0.183)	0.156	(0.151)	1.185**	(0.445)	-0.260	(0.199)	-0.007	(0.157)	12.189°
Use of Neigh. Resources	-0.106	(0.158)	0.393***	(0.112)	0.146	(0.133)	-0.153	(0.155)	0.262°	(0.139)	0.521***	(0.151)	0.265*	(0.119)	0.118	(0.111)	17.653*
Constant	0.445	(0.533)	-1.340***	(0.421)	-0.120	(0.453)	1.486°	(0.822)	-0.789	(0.654)	-1.330*	(0.618)	-0.791*	(0.398)	-1.018*	(0.452)	17.054*
Model R^2	0.162		0.170		0.073		0.164		0.046		0.165		0.139		0.096		

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

perceptions of incivilities for Kendall Hammocks Park. The invariance test was statistically significant, indicating that the apparent differences in these coefficients were not simply chance variation in the parameters across models. Interestingly, the only neighborhood where both of these variables reached statistical significance was Ives Dairy Estates.

There were additional significant relationships observed between the control variables and perceptions of incivilities. Older residents reported significantly lower perceptions of incivilities in Seminole Wayside Park and East Little Havana. Residence length was only associated with significantly higher perceptions of incivilities in Ives Dairy Estates. The invariance test was statistically significant suggesting that this difference reflected true heterogeneity between the neighborhoods. Employed residents reported significantly higher perceptions of incivilities in Brownsville, but significantly lower perceptions of incivilities in East Little Havana. The invariance test was not significant, suggesting this difference reflected chance variations in the coefficients for these neighborhoods. Residents of Brownsville with at least some college education reported significantly lower perceptions of incivilities; the significant invariance test indicates that this difference represented true heterogeneity in the coefficients between neighborhoods. Residents in Brownsville using income assistance reported significantly higher perceptions of incivilities, but residents in Coral Reef Park using income assistance reported significantly lower perceptions of incivilities. While the result for Coral Reef Park was likely problematic due to the small number of residents using income assistance, the invariance test was statistically significant and may indicate that the coefficient for Brownsville represents meaningful heterogeneity in the impact of this variable. Use of neighborhood resources was associated with significantly higher perceptions of incivilities in Bunche Park and Ives Dairy Estates.

Table 20C. Structural Equation Model Results by Neighborhood - Perceptions of Incivilities

Variable	Brownsville b	Brownsville SE	Bunche Park b	Bunche Park SE	Seminole Wayside Park b	Seminole Wayside Park SE	East Little Havana b	East Little Havana SE	Auberdale b	Auberdale SE	Coral Reef Park b	Coral Reef Park SE	Ives Dairy Estates b	Ives Dairy Estates SE	Kendall Hammocks Park b	Kendall Hammocks Park SE	Invariance Test
Percep. Collective Efficacy	-0.380*	(0.156)	0.128	(0.150)	-0.146	(0.104)	-0.150°	(0.096)	-0.107°	(0.060)	-0.073	(0.051)	-0.145*	(0.071)	-0.041	(0.054)	7.854
Percept of Social Cohesion	-0.258°	(0.139)	-0.341°	(0.177)	-0.237**	(0.085)	-0.395***	(0.086)	-0.217***	(0.060)	-0.082°	(0.044)	-0.417***	(0.087)	0.034	(0.067)	30.902***
Sex	-0.072	(0.200)	-0.049	(0.199)	-0.168	(0.158)	-0.236	(0.194)	0.115	(0.113)	-0.029	(0.081)	0.096	(0.142)	0.021	(0.114)	4.406
Hispanic	-0.284	(0.325)	0.173	(0.388)	0.322°	(0.175)	0.520	(0.566)	-0.229	(0.349)	0.113	(0.091)	0.260°	(0.152)	-0.176	(0.157)	8.710
Age	0.012°	(0.007)	-0.003	(0.010)	-0.010*	(0.005)	-0.013*	(0.006)	-0.005	(0.004)	-0.001	(0.003)	0.003	(0.006)	0.000	(0.004)	11.780
Residence Length	-0.006	(0.008)	-0.002	(0.009)	0.006	(0.010)	-0.011	(0.015)	0.008	(0.006)	-0.001	(0.004)	0.027***	(0.008)	0.019°	(0.011)	14.444*
Employment	0.500*	(0.212)	0.018	(0.253)	0.038	(0.171)	-0.459*	(0.206)	0.003	(0.128)	0.037	(0.098)	-0.074	(0.159)	0.064	(0.126)	11.094
High School Grad/GED	-0.296	(0.317)	-0.127	(0.309)	-0.326°	(0.194)	-0.620°	(0.339)	-0.019	(0.163)	-0.154	(0.238)	-0.033	(0.304)	0.113	(0.211)	5.286
Some College	-1.071**	(0.338)	-0.242	(0.351)	0.001	(0.196)	-0.194	(0.201)	0.233	(0.164)	-0.033	(0.218)	0.090	(0.284)	0.153	(0.200)	14.111*
Home Ownership	-0.105	(0.266)	-0.243	(0.242)	0.327°	(0.186)	0.244	(0.306)	0.034	(0.136)	0.061	(0.110)	-0.191	(0.196)	-0.062	(0.147)	6.288
Income Assistance	0.598*	(0.254)	-0.393	(0.271)	-0.029	(0.182)	-0.007	(0.196)	0.168	(0.115)	-0.982***	(0.272)	-0.373°	(0.206)	0.049	(0.137)	26.237***
Use of Neigh. Resources	-0.018	(0.235)	0.460*	(0.198)	0.225	(0.142)	-0.035	(0.166)	-0.067	(0.108)	0.126	(0.091)	0.279*	(0.127)	0.087	(0.094)	9.416
Property Care	-0.193	(0.138)	-0.056	(0.127)	0.255°	(0.132)	0.085	(0.116)	0.203**	(0.077)	0.028	(0.079)	0.021	(0.082)	-0.150*	(0.065)	18.744**
Constant	-0.687	(0.825)	-0.239	(0.819)	-0.705	(0.508)	1.117	(0.877)	-0.204	(0.505)	-0.426	(0.383)	-0.793°	(0.424)	-0.296	(0.394)	4.598
COV(e1, e2)	0.261**	(0.092)	0.127	(0.089)	0.124**	(0.048)	-0.004	(0.053)	-0.062°	(0.037)	-0.012	(0.022)	0.052	(0.043)	-0.039	(0.030)	22.895**
COV(e1, e3)	0.003	(0.033)	0.080	(0.052)	0.134*	(0.060)	0.008	(0.080)	-0.017	(0.051)	0.063***	(0.019)	0.112*	(0.051)	0.135***	(0.042)	11.631
Model R^2	0.368		0.113		0.185		0.212		0.191		0.152		0.276		0.092		

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

The instrumental variable, property care, was associated with significantly lower perceptions of incivilities in Kendall Hammocks Park (the only statistically significant variable) and with significantly higher perceptions of incivilities in Auberdale. The invariance test suggested that these differences reflected true heterogeneity in this coefficient between neighborhoods.

The results for the second outcome variable, satisfaction with the police, are presented in Table 20D. Again, there were differences in the explained variance of this outcome between neighborhoods, ranging from 50.6% in Ives Dairy Estates to 26.3% in East Little Havana. Higher perceptions of collective efficacy were associated with significantly higher satisfaction with the police in Coral Reef Park and Ives Dairy Estates. Higher perceptions of social cohesion were associated with greater satisfaction with the police in East Little Havana, Auberdale, Coral Reef Park, and Ives Dairy Estates. The invariance tests for the coefficients of both variables were not statistically significant, which suggests consistent, but small coefficients for these variables across neighborhoods.

There were some additional significant relationships between satisfaction with the police and the control groups. Older residents of East Little Havana reported significantly higher satisfaction with the police, but there appeared to be little heterogeneity in the size of this coefficient between neighborhoods. Residents of Ives Dairy Estates that were either High School graduates (or equivalent) and those who completed at least some college reported significantly higher levels of satisfaction with the police. However, the invariance test was not significant, and it remains possible that these observed differences were only due to random variation in these coefficients between neighborhoods. Homeownership was associated with significantly lower satisfaction with the police in East Little Havana and Ives Dairy Estates, but again, the invariance test only approached statistical significance. Increased use of neighborhood resources

was associated with significantly higher satisfaction with the police, but only in Seminole Wayside Park. Again, the invariance test was not statistically significant. According to the invariance tests, the instrumental variables both exhibited considerable heterogeneity in their coefficients across neighborhoods. Increased police visibility was associated with greater police satisfaction in every neighborhood except Brownsville, where it was associated with significantly lower satisfaction. Lower perceptions of the quality of police response to problems were significantly associated with lower levels of satisfaction in every neighborhood except Bunche Park, where the relationship did not reach significance. While significant, the coefficient of this variable for East Little Havana was considerably lower than the coefficients for other neighborhoods.

The results for the final outcome variable, fear of crime, are presented in Table 20E. Again, there were some observed differences in the explained variance of the model across neighborhoods, ranging from 35.6% in East Little Havana to 20.3% in Bunche Park. Higher perceptions of collective efficacy were associated with lower fear of crime in Coral Reef Park, Ives Dairy Estates, and Kendall Hammocks Park. Interestingly, higher perceptions of collective efficacy were associated with significantly higher fear of crime in Seminole Wayside Park. The invariance test was statistically significant, suggesting that this coefficient differed substantially across neighborhoods. Higher perceptions of social cohesion were associated with significantly lower fear of crime for Brownsville, Seminole Wayside Park, and East Little Havana. This relationship approached statistical significance in Coral Reef Park and Ives Diary Estates. The invariance test was statistically significant, indicating that this coefficient exhibited considerable heterogeneity across neighborhoods.

Table 20D. Structural Equation Model Results by Neighborhood - Satisfaction with Police

Variable	Brownsville b	SE	Bunche Park b	SE	Seminole Wayside Park b	SE	East Little Havana b	SE	Auberdale b	SE	Coral Reef Park b	SE	Ives Dairy Estates b	SE	Kendall Hammocks Park b	SE	Invariance Test
Percep. Collective Efficacy	0.218	(0.138)	0.029	(0.102)	-0.036	(0.069)	0.019	(0.059)	0.035	(0.061)	0.108*	(0.050)	0.142**	(0.055)	0.054	(0.041)	7.116
Percept of Social Cohesion	0.110	(0.125)	0.222	(0.120)	0.036	(0.057)	0.170***	(0.050)	0.153*	(0.063)	0.113*	(0.045)	0.240***	(0.067)	0.072	(0.053)	8.136
Sex	-0.183	(0.169)	0.014	(0.146)	0.076	(0.109)	0.111	(0.113)	0.064	(0.118)	0.024	(0.083)	0.143	(0.107)	0.084	(0.086)	3.273
Hispanic	0.406	(0.281)	0.009	(0.277)	0.062	(0.119)	-0.499	(0.328)	-0.193	(0.357)	0.166°	(0.092)	0.091	(0.118)	-0.026	(0.122)	6.784
Age	0.009	(0.006)	0.004	(0.007)	0.001	(0.003)	0.008*	(0.003)	0.005	(0.004)	0.004	(0.003)	-0.002	(0.005)	0.004	(0.003)	4.894
Residence Length	0.001	(0.007)	-0.009	(0.007)	0.005	(0.007)	0.008	(0.009)	-0.001	(0.006)	0.003	(0.004)	0.010	(0.006)	-0.011	(0.008)	7.274
Employment	-0.133	(0.174)	0.276	(0.187)	-0.051	(0.117)	0.189	(0.117)	0.124	(0.131)	0.085	(0.094)	-0.060	(0.123)	-0.094	(0.095)	7.975
High School Grad/GED	0.266	(0.261)	-0.172	(0.229)	-0.075	(0.133)	0.201	(0.193)	0.079	(0.163)	0.069	(0.240)	0.102	(0.235)	0.334*	(0.159)	6.001
Some College	-0.389	(0.286)	0.007	(0.259)	-0.161	(0.134)	0.143	(0.115)	0.042	(0.167)	-0.060	(0.223)	0.147	(0.216)	0.330*	(0.150)	9.434
Home Ownership	0.355	0.225	-0.242	(0.186)	-0.040	(0.128)	-0.363*	(0.178)	0.115	(0.139)	-0.205°	(0.108)	-0.29*	(0.147)	-0.021	(0.102)	13.437°
Income Assistance	0.217	(0.220)	-0.326	(0.200)	0.041	(0.124)	-0.006	(0.113)	0.055	(0.116)	-0.301	(0.275)	-0.061	(0.164)	0.087	(0.103)	5.956
Use of Neigh. Resources	0.002	(0.203)	-0.025	(0.144)	0.259**	(0.098)	-0.103	(0.095)	-0.066	(0.109)	0.068	(0.092)	0.128	(0.099)	0.137°	(0.072)	10.361
Police Visibility	-0.398**	(0.141)	0.411***	(0.068)	0.101*	(0.041)	0.162*	(0.070)	0.351***	(0.044)	0.070*	(0.035)	0.258***	(0.046)	0.156***	(0.034)	60.244***
Police Response to Problems	-0.620***	(0.173)	-0.171	(0.116)	-0.660***	(0.098)	-0.306***	(0.090)	-0.610***	(0.135)	-0.700***	(0.139)	-0.584***	(0.104)	-0.706***	(0.143)	21.296**
Constant	5.803***	(0.913)	3.105***	(0.735)	4.287***	(0.425)	3.994***	(0.621)	3.628***	(0.628)	4.949***	(0.499)	3.885***	(0.429)	4.270***	(0.423)	8.932
COV(e2, e1)	0.261**	(0.092)	0.127	(0.089)	0.124**	(0.048)	-0.004	(0.053)	-0.062°	(0.037)	-0.012	(0.022)	0.052	(0.043)	-0.039	(0.030)	22.895**
COV(e2, e3)	-0.059*	(0.029)	-0.010	(0.043)	-0.023	(0.041)	-0.081°	(0.046)	-0.031	(0.050)	-0.011	(0.021)	-0.073°	(0.038)	-0.021	(0.029)	4.677
Model R^2	0.366		0.393		0.342		0.263		0.429		0.299		0.506		0.326		

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

Other control variables also carried statistically significant coefficients with fear of crime. Females living in Seminole Wayside Park reported significantly lower fear of crime. The invariance test, however, was not statistically significant. Hispanic residents of East Little Havana and Kendall Hammocks Park reported significantly higher fear of crime, but again, the invariance test was not significant. Longer residence length was associated with lower fear of crime, but only in East Little Havana; and the invariance test was not statistically significant. Residents with High School degrees or equivalent reported significantly higher fear of crime in Brownsville, but again the invariance test was not statistically significant. Home ownership was associated with significantly lower fear of crime in Bunche Park, but significantly higher fear of crime in Ives Dairy Estates. The invariance test for this coefficient was statistically significant, indicating heterogeneity in this coefficient across neighborhoods. Residents using income assistance in Auberdale reported significantly higher levels of fear of crime. The invariance test was statistically significant for this coefficient as well. Higher use of neighborhood resources was associated with higher fear of crime in Seminole Wayside Park and East Little Havana. The group invariance test was statistically significant indicating that these observed differences were unlikely to be due to random variability in the coefficients across neighborhoods. Finally, the instrumental variable response to fear of crime was associated with significantly higher fear of crime for all neighborhoods but Kendall Hammocks Park. The invariance test was significant for this variable as well.

Conclusions

The results of the above analyses suggested that there was considerable heterogeneity in the relationships between perceptions of collective efficacy and perceptions of

Table 20E. Structural Equation Model Results by Neighborhood - Fear of Crime

Variable	Brownsville b	Brownsville SE	Bunche Park b	Bunche Park SE	Seminole Wayside Park b	Seminole Wayside Park SE	East Little Havana b	East Little Havana SE	Auberdale b	Auberdale SE	Coral Reef Park b	Coral Reef Park SE	Ives Dairy Estates b	Ives Dairy Estates SE	Kendall Hammocks Park b	Kendall Hammocks Park SE	Invariance Test
Percep. Collective Efficacy	-0.081	(0.063)	-0.086	(0.071)	0.204*	(0.092)	0.025	(0.085)	0.047	(0.085)	-0.127*	(0.053)	-0.185**	(0.071)	-0.390***	(0.063)	39.091***
Percept of Social Cohesion	-0.193**	(0.064)	-0.134	(0.083)	-0.153*	(0.075)	-0.347***	(0.078)	0.010	(0.084)	-0.075°	(0.044)	-0.155°	(0.086)	-0.025	(0.070)	15.329*
Sex	-0.006	(0.075)	-0.099	(0.101)	-0.358*	(0.141)	-0.315°	(0.167)	0.063	(0.160)	-0.017	(0.081)	0.021	(0.136)	0.148	(0.118)	11.565
Hispanic	-0.000	(0.124)	0.108	(0.189)	0.227	(0.156)	1.120*	(0.494)	0.328	(0.489)	0.156°	(0.090)	0.075	(0.145)	0.556***	(0.165)	11.881
Age	-0.004	(0.003)	0.003	(0.005)	-0.004	(0.005)	-0.004	(0.005)	0.002	(0.006)	-0.004	(0.003)	0.009°	(0.006)	0.005	(0.004)	9.479
Residence Length	-0.004	(0.003)	0.005	(0.005)	0.001	(0.009)	-0.031*	(0.013)	0.001	(0.008)	-0.002	(0.004)	-0.003	(0.008)	0.002	(0.011)	8.229
Employment	0.021	(0.079)	0.054	(0.131)	-0.069	(0.154)	0.023	(0.174)	-0.032	(0.180)	-0.041	(0.091)	0.068	(0.152)	-0.207	(0.136)	3.028
High School Grad/GED	0.230*	(0.117)	-0.046	(0.158)	-0.205	(0.177)	0.037	(0.290)	-0.088	(0.224)	-0.437°	(0.237)	0.386	(0.293)	0.041	(0.219)	10.532
Some College	0.212	(0.128)	-0.005	(0.179)	-0.005	(0.177)	0.049	(0.173)	0.232	(0.233)	-0.253	(0.217)	0.239	(0.270)	0.336	(0.207)	6.087
Home Ownership	-0.026	(0.099)	-0.372**	(0.123)	0.033	(0.167)	-0.133	(0.262)	0.177	(0.193)	0.178°	(0.107)	0.511**	(0.182)	-0.095	(0.141)	21.438**
Income Assistance	-0.041	(0.094)	0.059	(0.138)	-0.065	(0.163)	0.201	(0.168)	0.428**	(0.161)	-0.469°	(0.258)	-0.093	(0.196)	-0.215	(0.143)	14.792*
Use of Neigh. Resources	-0.101	(0.088)	0.004	(0.100)	0.361**	(0.130)	0.600***	(0.143)	0.094	(0.151)	0.128	(0.090)	0.123	(0.120)	0.070	(0.099)	22.445**
Response to Fear	0.466**	(0.156)	0.496*	(0.201)	1.192***	(0.216)	0.529*	(0.241)	1.373***	(0.260)	0.680***	(0.179)	1.391***	(0.216)	0.300	(0.233)	28.338***
Constant	-0.439	(0.289)	-0.286	(0.398)	-0.668	(0.443)	-1.662*	(0.751)	-1.113	(0.697)	-0.433	(0.360)	-1.664***	(0.404)	-1.215**	(0.404)	11.488
COV(e3, e1)	0.003	(0.033)	0.080	(0.052)	0.134*	(0.060)	0.008	(0.080)	-0.017	(0.051)	0.063***	(0.019)	0.112*	(0.051)	0.135***	(0.042)	11.631
COV(e3, e2)	-0.059*	(0.029)	-0.010	(0.043)	-0.023	(0.041)	-0.081°	(0.046)	-0.031	(0.050)	-0.011	(0.021)	-0.073°	(0.038)	-0.021	(0.029)	4.677
Model R^2	0.275		0.203		0.280		0.356		0.279		0.204		0.347		0.337		
Full Model R^2	0.683		0.646		0.632		0.601		0.656		0.593		0.780		0.578		

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

social cohesion with a number of key variables across neighborhoods. From the models for perceptions of collective efficacy, very few variables appeared as consistent significant predictors across models. Further, the influence of home ownership on perceptions of collective efficacy appeared to be dependent upon the neighborhood of residence. There appeared to be more heterogeneity in the relationships between perceptions of collective efficacy and control variables. The relationship between perceptions of social cohesion and sex, some college education, and use of neighborhood resources showed considerable heterogeneity across neighborhoods. While other variables carried statistically significant relationships with perceptions of social cohesion in particular neighborhoods, these relationships did not appear consistent across neighborhoods.

We found interesting and unexpected results when examining models for the three main outcome variables. The relationship between perceptions of collective efficacy and perceptions of incivilities was only significant for two of the neighborhoods under investigation and approached significance in two others; however the invariance test indicated that there was little heterogeneity in this relationship across neighborhoods. This is consistent with the previous finding of a small, but significant, negative relationship between these variables in the full model. In contrast, the relationship between perceptions of social cohesion and perceptions of incivilities was significant in four neighborhoods and approached significance in three others. However, the relationship between perceptions of social cohesion and perceptions of incivilities was non-significant and small in two neighborhoods, Coral Reef Park and Kendall Hammocks Park. These neighborhoods had the highest median income and percentage of residents with at

least some college education.[26] The invariance test confirmed that the relationship between perceptions of social cohesion and perceptions of incivilities varied across neighborhoods, so the substantially attenuated relationship in these two neighborhoods represented real differences as opposed to random variation in the size of the coefficients.

For the second outcome variable, satisfaction with the police, there were some differences in the pattern of significant relationships observed. For perceptions of collective efficacy, the relationship with satisfaction with the police was only statistically significant for Coral Reef Park and Ives Dairy Estates. For perceptions of social cohesion, the relationship with satisfaction with the police was significant for East Little Havana, Auberdale, Coral Reef Park, and Ives Dairy Estates. The results of the invariance test for both sets of coefficients suggest, however, that these observed differences may simply represent chance variations in the size of the coefficients between neighborhoods. As such, these results are consistent with the small, consistent positive coefficients identified in the pooled model previously.

There are some very interesting results for the final outcome variable, fear of crime. The relationship between perceptions of collective efficacy and fear of crime was statistically significant and negative for three neighborhoods: Coral Reef Park, Ives Dairy Estates, and Kendall Hammocks Park. The size of the coefficient in Kendall Hammocks Park was quite large. This relationship was not statistically significant for Brownsville, Bunche Park, East Little Havana, and Auberdale. These neighborhoods were the least racially and ethnically heterogeneous neighborhoods in the sample, with the first two neighborhoods consisting of over

[26] The percentage of residents with at least a college education is based on the characteristics in the Census, rather than the numbers reported here. The respondents to our survey indicate slightly lower levels of education and lower educational attainment than observed in Ives Dairy Estates. This could be a function of a larger number of female respondents who are homemakers rather than working mothers.

94% African-American residents and the latter two consisting of over 94% Hispanic/Latino residents (mostly of Cuban descent). It would appear that perceptions of collective efficacy have little to no influence on fear of crime in these communities. Strangely, perceptions of collective efficacy have a significant, *positive* relationship with fear of crime in Seminole Wayside Park. Currently, we have no explanation for this relationship. The invariance test was statistically significant confirming the substantial heterogeneity in the coefficients observed between neighborhoods. The relationship between perceptions of social cohesion and fear of crime was statistically significant and negative in Brownsville, Seminole Wayside Park, and East Little Havana. This relationship approached statistical significance in Coral Reef Park and Ives Dairy Estates. The invariance test confirmed the observed heterogeneity in this coefficient between neighborhoods. Interestingly, there was little overlap between neighborhoods in the significance of the relationships between fear of crime and perceptions of collective efficacy and perceptions of social cohesion (with the exception of Seminole Wayside Park where they appear to work at cross-purposes). It would seem that for some communities, particularly those with less racial and ethnic heterogeneity, a sense of belonging and shared values is more important for understanding fear of crime. In contrast, in neighborhoods with less heterogeneity, perceiving the community's ability to mobilize community resources to affect the common good seems to be more important for understanding fear of crime.

These results appear consistent with the findings of Swatt et al. (2013) who found considerable heterogeneity in the relationship between collective efficacy and fear of crime across four of the neighborhoods in this sample. These results extend this finding by introducing the improved measure of perceptions of collective efficacy and perceptions of social cohesion, as well as examining more neighborhoods and introducing a model with substantially more

protection against problems with endogeneity. Unfortunately, the limited number of neighborhoods examined in this analysis prohibits more than a cursory consideration of the patterns observed through reflection on the characteristics of the neighborhoods in the sample. Future research should examine the causes and consequences of this heterogeneity in understanding the relationship between these key measures of neighborhood social functioning with a larger sample of neighborhoods.

CHAPTER VI. EXPLORING THE PREDICTORS OF PERCEPTIONS OF COLLECTIVE EFFICACY AND PERCEPTIONS OF SOCIAL COHESION

Abstract

In this chapter, we examine the predictors of perceptions of collective efficacy and perceptions of social cohesion in more detail. Specifically, we decompose the use of neighborhood resources variables into the individual indicators and consider whether levels of usage of particular resources (such as libraries, churches, community centers, grocery stores, etc.) are associated with perceptions of collective efficacy and social cohesion. Further, we also include variables to measure knowledge of community meetings and social activities and participation in volunteer activities within the community. We use bootstrapped OLS regression to estimate the models and correct for the clustering of residents within neighborhoods.

The results of these models indicated that there were important differences in the predictors of perceptions of collective efficacy and social cohesion. Specifically,

- Home ownership was associated with higher perceptions of social cohesion, but not collective efficacy;
- Greater use of neighborhood parks was associated with higher perceptions of collective efficacy and social cohesion;
- Greater use of neighborhood grocery stores was associated with higher perceptions of collective efficacy;
- Greater use of neighborhood medical facilities was associated with higher perceptions of social cohesion;
- Knowledge of community meetings was associated with higher perceptions of collective efficacy;
- Participation in volunteer activities was associated with higher perceptions of social cohesion.

While these analyses should be considered exploratory, the results are informative for hypothesizing about the differences between collective efficacy and social cohesion. We conjecture that the dimension of social cohesion that remains after adjusting for its contribution to collective efficacy represents a resident's emotional investment in the community. Specifically, it can be considered a resident's personal investment in the community and a sense of belonging and shared destiny with other residents. Based on current and previous results, this appears to be distinct from the working trust needed to mobilize a community to exercise social control.

Overview

The previous chapters suggest that there are important differences in the relationships between perceptions of collective efficacy and perceptions of social cohesion. These differences are important because separate intervention strategies may be necessary to enhance each dimension of neighborhood functioning. For this reason, we conducted additional exploratory analyses to examine potential explanatory factors for perceptions of collective efficacy and social cohesion. Again, it is important to emphasize that perceptions of collective efficacy and perceptions of social cohesion are inherently individual-level phenomena under investigation. As such, we cannot directly assert that associations observed at the individual-level will translate into associations at the aggregate-level. However, the linkage between individual and aggregate level measures previously discussed suggests that these analyses provide a useful place to start for understanding factors that influence the development of collective efficacy and social cohesion.

To further explore the differences between perceptions of collective efficacy and social cohesion, we incorporated additional explanatory variables that were primarily associated with *activities* within the neighborhood and with *the use of specific resources* within the neighborhood. We hypothesize that activities associated with certain neighborhood resources foster attachment and involvement within the neighborhood. This occurs through two major processes. First, some activities lead to increased contact with other residents of the neighborhood and foster the development of social ties and exchange relationships with other residents. For example, the use of public resources, such as a park, may promote interaction with other residents who are also using the park. Residents using these resources have social networks that are denser when compared to other residents who do not utilize such common space. This

should manifest as higher perceptions of collective efficacy and social cohesion. Differences in the types of activities or public resources may be associated with enhancing perceptions of collective efficacy, perceptions of social cohesion, or both.

Second, other activities, like volunteer work, may increase an individual's social stake in the community, thereby enhancing emotional feelings of attachment to the neighborhood itself. This increase in social investment then translates into an increased sense of civic engagement and fosters a sense of belonging and shared destiny with other residents. We hypothesize that factors that increase the social stake within the community will primarily influence perceptions of social cohesion; however, given the conceptual overlap between perceptions of collective efficacy and perceptions of social cohesion this is far from certain.

We recognize that the current data are not fully capable of exploring these processes in greater detail. However, we believe that finding differential relationships between social activities and usage of neighborhood resources with perceptions of collective efficacy and social cohesion will be informative and noteworthy for future research. As such, these hypotheses ultimately remain untested.

Measures and Plan of Analysis

Perceptions of collective efficacy and perceptions of social cohesion are the main outcome variables in these analyses. With the exception of the use of neighborhood resources scale, the control variables remain the same as used in the previous chapters (sex, race/ethnicity, age, employment, education, etc.). For this analysis, additional variables were introduced into the model for both perceptions of collective efficacy and perceptions of social cohesion. A question was included in the survey that asked whether the respondent had knowledge of community meetings within the neighborhood in the previous six months to try and address local problems.

This was included as a yes/no dichotomous variable with "do not know" responses coded to no.[27] A second question that was introduced into the model asked respondents whether there have been social "get-togethers" within the neighborhood within the previous six months.[28] This variable was also included as a yes/no dichotomous variable with "do not know" responses coded to no. Finally, a question in the survey asked respondents whether they had engaged in volunteer work to benefit their community within the past year. This variable was also included as a dichotomous yes/no variable with "do not know" responses coded to no.

The use of neighborhood resources scale discussed previously was separated into the individual variables and included separately in the model. Additionally, two variables were reintroduced -- use of neighborhood youth programs and use of child care within the neighborhood. Since these variables capture the frequency of use of particular resources, "not applicable" responses were grouped with the "never" response category. This resulted in nine additional questions about the frequency of use of specific resources within the neighborhood: libraries, youth programs, churches, child care facilities, parks, community centers, grocery stores, medical facilities, and public transportation. Descriptive statistics for the 1,085 cases with complete information for these variables is presented in Table 21.

Since perceptions of collective efficacy and perceptions of social cohesion consist of the EAP scores from the bifactor model examined previously, these variables are measured on a

[27] It is important to emphasize that "do not know" was not a missing response. For the purpose of defining this variable, the "do not know" response suggests no definitive knowledge of such activities.

[28] Importantly, neither of these two measures captures whether the individual attended these activities. Unfortunately, due to inconsistencies with question wording and content, attendance in these activities remains unmeasured. However, these measures do capture awareness of particular neighborhood-specific activities, which may be important in shaping perceptions of neighborhood functioning. Only the measure of volunteer work within the neighborhood constitutes participation in a particular social activity.

Table 21. Descriptive Statistics for Variables in OLS Models (N = 1,085)

Variable	Minimum	Maximum	Mean	SD
Perceptions of Collective Efficacy	-2.969	2.435	0.053	0.946
Perceptions of Social Cohesion	-3.553	3.314	0.004	0.927
Sex	0.000	1.000	0.587	0.493
Hispanic	0.000	1.000	0.618	0.486
Black	0.000	1.000	0.178	0.383
Age	18.000	90.000	49.208	17.021
Number of Children	0.000	6.000	0.821	1.112
Residence Length	0.083	57.000	10.512	11.397
Employed	0.000	1.000	0.562	0.496
HS/GED	0.000	1.000	0.277	0.448
Some College	0.000	1.000	0.580	0.494
Home Ownership	0.000	1.000	0.501	0.500
Income Assistance	0.000	1.000	0.302	0.459
Know of Community Meetings	0.000	1.000	0.226	0.418
Know of Community Social Activites	0.000	1.000	0.262	0.440
Engage in Volunteer Activities	0.000	1.000	0.127	0.333
Use Neighborhood Library	0.000	3.000	1.172	1.140
Use Neighborhood Youth Program	0.000	3.000	0.298	0.706
Use Neighborhood Church	0.000	3.000	1.281	1.242
Use Neighborhood Child Care	0.000	3.000	0.274	0.757
Use Neighborhood Park	0.000	3.000	1.241	1.176
Use Neighborhood Community Center	0.000	3.000	0.502	0.897
Use Neighborhood Grocery Store	0.000	3.000	2.702	0.611
Use Neighborhood Medical Services	0.000	3.000	1.283	1.218
Use Neighborhood Public Transportation	0.000	3.000	0.808	1.169

standard normal metric with an approximate mean of zero and a standard deviation of one. As such, OLS regression is an appropriate method for analyzing these data. The restricted bifactor method generates factors that are orthogonal, allowing these variables to be modeled separately without concern for correlated errors between the variables. The data consist of respondents clustered within eight neighborhoods. Because of the large number of variables and the small number of clusters, standard errors were computed using the non-parametric bootstrap method (see StataCorp, 2011). Clustering was explicitly accounted for in the bootstrap and 100 replications were created for each model to generate the bootstrapped standard errors. Finally, it is important to acknowledge that because this analysis is exploratory and relies on cross-sectional data, there are obvious questions regarding the endogeneity of the use of neighborhood resources, which may in fact depend on perceptions of collective efficacy and social cohesion. Unfortunately, this remains a limitation of the current analysis and an issue that future research should address.

Results

The results for the bootstrapped OLS models for perceptions of collective efficacy and perceptions of social cohesion are presented in Table 22. For both models, the explained variance was low, 12.7% for perceptions of collective efficacy and 9.3% for perceptions of social control, indicating that there is a substantial amount of variation in these variables that remains unexplained. Interestingly, the predictors of perceptions of collective efficacy and perceptions of social cohesion did not show substantial overlap. In the model for perceptions of collective efficacy, knowledge of community meetings to deal with problems was associated with significantly higher perceptions of collective efficacy. Further, increased frequency of use of a

Table 22. Bootstrapped OLS Models for Perceptions of Collective Effiacy and Social Cohesion (N = 1,085)

Variable	Per. Collective Efficacy *b*	*Boot. SE*	Per. Social Cohesion *b*	*Boot SE*
Sex	-0.006	(0.091)	-0.139°	(0.078)
Hispanic	-0.021	(0.123)	0.031	(0.125)
Black	-0.001	(0.147)	-0.120	(0.164)
Age	0.005**	(0.002)	0.003°	(0.002)
Number of Children	0.015	(0.039)	-0.061	(0.050)
Residence Length	0.001	(0.003)	-0.002	(0.003)
Employed	-0.048	(0.049)	-0.114**	(0.045)
HS/GED	0.005	(0.071)	-0.199	(0.167)
Some College	0.101	(0.089)	-0.150	(0.184)
Home Ownership	0.144	(0.118)	0.216*	(0.081)
Income Assistance	-0.206°	(0.108)	-0.001	(0.051)
Know of Community Meetings	0.214*	(0.106)	0.054	(0.123)
Know of Community Social Activites	-0.044	(0.067)	0.042	(0.084)
Engage in Volunteer Activities	-0.051	(0.094)	0.233*	(0.116)
Use Neighborhood Library	-0.029	(0.025)	0.030	(0.033)
Use Neighborhood Youth Program	-0.070°	(0.041)	0.007	(0.045)
Use Neighborhood Church	0.020	(0.022)	0.012	(0.030)
Use Neighborhood Child Care	-0.060	(0.049)	0.030	(0.034)
Use Neighborhood Park	0.115*	(0.046)	0.084*	(0.042)
Use Neighborhood Community Center	-0.017	(0.023)	-0.050	(0.033)
Use Neighborhood Grocery Store	0.283**	(0.100)	0.091	(0.057)
Use Neighborhood Medical Services	-0.035	(0.024)	0.070*	(0.028)
Use Neighborhood Public Transportation	-0.044°	(0.023)	-0.053	(0.038)
Constant	-1.044***	(0.299)	-0.393	(0.304)
Model Statistics				
Chi-Square	1767.49***		1859.60***	
df	23		23	
R^2	0.127		0.093	

° $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$

neighborhood park was significantly associated with higher perceptions of collective efficacy. Greater use of neighborhood grocery stores was also significantly related to higher perceptions of collective efficacy. The relationships between perceptions of collective efficacy and use of neighborhood youth programs and public transportation were negative, but only approached statistical significance. In regard to the other control variables, only age was significant as older respondents reported significantly higher perceptions of collective efficacy. The relationship between use of income assistance and perceptions of collective efficacy only approached statistical significance.

For the model of perceptions of social cohesion, we observed a different pattern of significant relationships. Involvement in volunteer activities within the neighborhood was associated with significantly higher perceptions of social cohesion. Higher use of neighborhood medical facilities was also associated with significantly higher perceptions of social cohesion. Similar to the results in the previous model, greater use of neighborhood parks was associated with higher perceptions of social cohesion. Of the control variables, employed residents reported significantly lower perceptions of social cohesion than unemployed residents. Home owners, on the other hand, reported significantly higher perceptions of social cohesion than those who rented or had other living arrangements. The relationships between perceptions of social cohesion and sex and age only approached statistical significance.

Conclusions

We found important differences in the pattern of significant explanatory variables for perceptions of collective efficacy and perceptions of social cohesion. This suggests that these two facets of neighborhood functioning may arise from separate social processes. While it remains premature to detail these separate processes, it is still worthwhile to generate some

hypotheses for future research based on the patterns observed in this analysis. Perceptions of collective efficacy are related to both the extensiveness of social networks and the ability to leverage these networks for social action. Activities that enhance interaction with members of the community, such as use of neighborhood parks or neighborhood grocery stores, therefore appears to enhance an individual's perceptions of collective efficacy. Further, activities that demonstrate a community's capacity for action, such as knowledge of community meetings, also appear to enhance an individual's perceptions of collective efficacy. On the other hand, perceptions of social cohesion may capture an individual's emotional and social investment in the community and sense of belonging and shared fate. Activities that serve to enhance an individual's investment in the community (such as participation in community volunteer activities or use of neighborhood parks) should increase perceptions of social cohesion, as should other factors that increase an individual's stake in the well-being of the community (such as home ownership). Again, caution is warranted as extant research has not adequately tested these hypotheses. For that reason, these hypotheses should only serve to help guide future research.

CHAPTER VII. WITHIN NEIGHBORHOOD VARIATION IN COLLECTIVE EFFICACY AND SOCIAL COHESION

Abstract

In this chapter, we consider whether collective efficacy and social cohesion demonstrate differences within neighborhoods. Very few studies have examined social functioning with units of analysis smaller than the neighborhood. This is surprising, as research demonstrates that "hot spots" of crime often occur in smaller areas within neighborhoods. One reason for this is the lack of a methodological strategy designed to assess local variations in social functioning. We use kriging maps to show the links between collective efficacy and social cohesion and "awareness space" (the area within a neighborhood that a person moves through routinely.) [Kriging is a method that reflects these awareness spaces by interpolating a smooth surface based on the observed values (of resident's responses) at spatial points and the distance and autocorrelation between them.]

Using scores for the perceptions of collective efficacy and perceptions of social cohesion calculated earlier, we created spatial surfaces for collective efficacy and social cohesion for each of the eight neighborhoods under investigation. Specifically, we attempted to determine whether there were rises (areas with higher levels) or sinks (areas with lower levels) in collective efficacy and social cohesion using kriging maps. We discuss the features of each neighborhood to help explain the observed patterns. These analyses showed:

- There is considerable local variation in collective efficacy and social cohesion within neighborhoods;
- Rises and sinks in collective efficacy and social cohesion do not necessarily coincide, indicating that two distinct social processes are at work;
- The locations of rises and sinks appear to follow patterns of land use (e.g., housing quality, features of space, and residential tenure);
- Homicides seem to occur in or near sinks in collective efficacy or social cohesion, but the pattern is sparse given the rarity of the events, including other crime patterns may be more revealing.

The differences in collective efficacy and social cohesion suggest that policy makers, with proper input from research, could more appropriately target and address intra-neighborhood issues and also could design and implement unique solutions within these targeted areas.

Overview

One of the major limitations of prior research on collective efficacy is that researchers have almost exclusively focused on the neighborhood or similarly-sized ecological units as the

central focus of analysis. This limitation surfaces due to deliberate design considerations, as comparisons are made between neighborhoods, or neighborhood clusters, and the levels of collective efficacy and corresponding rates of violent crime or other outcomes. Raudenbush and Sampson (1999a, 1999b) developed methods to demonstrate that it is possible to obtain ecological measures with substantial reliability while sampling a small number of residents per neighborhood. While this strategy is helpful in minimizing survey expenses and maximizing the number of neighborhoods sampled, it means that we are unable to accurately estimate within neighborhood variability of social functioning variables.

While research on between-neighborhood comparisons of social functioning remains critically important, it overlooks the possibility that there is considerable variability in collective efficacy *within* neighborhoods. The within neighborhood variability in crime risk is well documented in the "hotspots" literature, as it is common that hotspots of criminal activity and criminal victimization exist at spatial resolutions smaller than the level of the neighborhood or similarly sized ecological units of analysis (see Sherman et al., 1989; Roncek, 1981). What appears to be absent in this research is a theoretically-based methodological strategy for considering within neighborhood variability in collective efficacy.

A key point in this discussion is the nexus between an individual's perceptions of collective efficacy and the level of collective efficacy of the larger ecological unit that is assessed using these respondents' perceptions. The methodological strategy advocated by Raudenbush and Sampson (1999a, 1999b) is derived from generalizability theory and suggests that individual respondents are treated as "raters" of community-level functioning. Therefore, by combining the responses by raters in a multilevel model, it becomes possible to assess overall community functioning. The variability between the individual perceptions of the social

environment is incorporated into the individual-level error term and provides a method for assessing the reliability of the responses within a neighborhood.

Unfortunately, this strategy misses the notion that an individual's perceptions of community functioning are intimately linked to their pattern of activity within this neighborhood. The overall assessment of community functioning should be, in large part, informed by their pattern of routine activities in the neighborhood (e.g., where they live, where they take their children to school, where they shop, and where they work). As such, the reliability of an individual's rating of neighborhood social functioning varies according to her particular routine activities. Following the research of Brantingham and Brantingham (1999), we postulate that the "awareness space" shaped by an individual's movements throughout their neighborhood constitutes the areas of the neighborhood for which their perceptions are most informative. Further, these perceptions formed from direct observation would be coupled with more diffuse knowledge about neighborhood social functioning obtained through secondary sources of information, such as talking with friends and acquaintances living in other sections of the neighborhood and other similar indirect sources of information. While these secondary sources of information certainly shape an individual's perceptions of social functioning, we expect that the most salient information influencing an individual's perceptions of neighborhood social functioning comes from her direct observations and interactions within her awareness space.

Spatial Patterns and Surfaces

While additional research is necessary to articulate the exact nature of this spatial patterning of activity and its consequences on measures of collective efficacy, it seems fair to argue that a substantial amount of activity should correspond to the areas surrounding an individual's place of residence. All things considered, an individual's home serves as a major

focal point for community activity and the primary basis for an individual's perceptions of community functioning. The areas around the home will often be the most frequent areas travelled, at the very least, because it is necessary to travel through these areas to reach other transportation arteries. Further, neighbors and residents in nearby areas (often on the same and nearby streets) will be a primary source of social interaction, simply as a consequence of frequency of use of shared space. Other social activities, such as play areas for children, are also primarily focused around a residence. Taylor (1997) argued, for these and other reasons, that smaller units of analysis such as the face-block, have an important role to play in social disorganization theories. As such, it is sensible to use an individual's residence as a main focal point for the informational content of measures of perceptions of collective efficacy (and other perceptive measures). This implies that an individual's perceptions of collective efficacy does not necessarily reflect an accurate assessment of collective efficacy across the entire neighborhood, but rather the accuracy of the measure decreases as the distance from the individual's awareness space increases. If the respondent's residence is used as the key focal point for the awareness space, an individual's perception of collective efficacy should be more accurate for local areas around the residence and less so for increased distances away from the residence. As such, respondents' perceptions should "count more" for areas close to their residence and "count less" for areas further away from the residence. This introduces natural spatial variability of respondents' perceptions of collective efficacy across the neighborhood. This in turn, introduces natural spatial variability in aggregate measures of social functioning within the neighborhood. This spatial variation is overlooked in between neighborhood comparisons as it is reflected as variation between respondents within a neighborhood (*i.e.*, the individual-level error term).

From this observation, we define within-neighborhood social functioning, such as collective efficacy, as a spatial surface that incorporates this spatial variability in individual perceptions. The expected value of collective efficacy at a particular point (or small spatial area, e.g. a "local neighborhood" around the point[29]) can be defined as the average value of the perceptions of collective efficacy of all residents weighted by some function of distance from each resident's awareness space. Applying the simplifying assumption that the predominate focus of the awareness space is the place of residence, this definition of collective efficacy as a spatial surface can be refined to imply that the weighting should be done as a function of distance from each resident's home.[30] Arguably, this conceptualization of a spatial surface is consistent with the research by Sampson et al. (1997; also Raudenbush & Sampson, 1999a, 1999b) as respondents are used as "informants" or "raters" of neighborhood social functioning. The main conceptual difference is that when combining information across raters, this approach weights the contribution of raters as a function of distance and location.

"Rises" and "Sinks"

The idea that collective efficacy can be measured as a spatial surface within the neighborhood has important implications for research. First, it becomes possible to discuss high areas (*rises*) or low areas (*sinks*) that reflect variation in collective efficacy within the neighborhood. Second, it becomes worthwhile to consider whether the patterning of criminal

[29] "Local neighborhood" is being used in the mathematical sense to describe a spatial circular area with a decreasing radius. This should not be confused with the neighborhood as a socially defined construct as used in other sections of this report.
[30] Refinements in measurement of the awareness space in community surveys and refinements in the methodology for aggregating these responses may make this simplifying assumption unnecessary.

events within the neighborhood reflect these sinks and rises in collective efficacy. Third, it becomes reasonable to consider whether features of space, such as particular land uses, influence the locations of these sinks and rises. Finally, although it lies beyond the scope of the current project, it is possible to observe changes in the location and intensity of sinks and rises over time.

How do we estimate this spatial surface? The strategy we propose borrows heavily from the field of geostatistics. An analogy of the strategy that is employed in the current research can be found with the measurement of rainfall across a spatial area. Meteorologists do not measure average rainfall at every point across a spatial area. Instead, detectors are set at various fixed spatial locations to sample the amount of rainfall in a small spatial area. Then, using the data from these detectors, a spatial surface is interpolated using knowledge of the measure of rainfall at each detector, the locations of these detectors, and the spatial distance between them. Similarly, it is not possible to interview every resident of a neighborhood to generate the spatial surface of collective efficacy. As such, it is necessary to sample residents within a neighborhood. With knowledge of the location of the residence of each respondent, we can interpolate a spatial surface of collective efficacy based on the perceptions of collective efficacy for each of the sampled residents, the location of the residence of each resident, and the distances between these residences.

Kriging

One method of spatial interpolation currently used for hot spot analysis is kernel density estimation. This method is used to generate a probabilistic surface for the occurrence of criminal events based on the location of previous criminal events. Unfortunately, as currently implemented, this method is not appropriate, as collective efficacy represents a smooth surface

for a continuous variable rather than a probabilistic surface for the occurrences of events. An alternative strategy that is appropriate for continuous variables is *kriging*.

Kriging is a method for interpolating values at non-sampled areas based on modeling the empirical semi-variogram (or other related functions) and generating predicted values based on this model (see Atkinson & Lloyd, 2009). The empirical semi-variogram is simply a quantification of the spatial autocorrelation between sampled points as a function of distance. Modeling the empirical semi-variogram, therefore, provides a method for estimating the similarity between points as a function of the distance between them and enables interpolation based on the value, location, and distance of the sampled points.

The basic kriging model can be represented as (ESRI, 2001):

$$Z(s) = \mu(s) + \varepsilon(s)$$

This model represents the value of the variable of interest at a point defined by location *s* as a function of a deterministic trend, μ(s), and an error term, ε(s). The error term is assumed to have an expectation of zero and the degree of autocorrelation between any two points is assumed to be a function of the distance between these points and not the actual locations of the points. While there are a number of different types of kriging models, the most common method (and the one used in this report) is "ordinary" kriging. Ordinary kriging assumes that the mean value at each point varies spatially across the spatial surface, i.e. the mean remains constant only within a local neighborhood of each point (see Atkinson & Lloyd, 2009).

This method of spatial interpolation is consistent with the theoretical assumptions that were made above, namely that the contribution of an individual's perceptions of collective efficacy towards the total spatial surface will decrease as a function of the distance between a particular point and the residence of the respondent. Given the previous findings of the additional

dimension of perceptions of social cohesion in the perceptions of collective efficacy scale, we assume that it is worthwhile to examine the spatially interpolated surfaces within neighborhood for both social processes. The basic ordinary kriging model described above represents a useful starting point for exploring the local variability in collective efficacy and social cohesion. The analyses that follow are an exploratory effort in examining the local variability in collective efficacy and social cohesion.

Methods

We use the EAP scores for the perceptions of collective efficacy and perceptions of social cohesion for our analyses. These scores were used to generate the kriged distributions of collective efficacy and social cohesion separately for each neighborhood. We assumed that there is no spatial variation in the IRT model used to produce these scores.[31] This results in a "two-step" procedure for estimating the local variability in collective efficacy and social cohesion. First we estimated the value of the latent variables of interest from a measurement model (which was done in the first analysis section of this report) and second, we estimated the kriged distribution as a function of these estimated values. As discussed later, an important limitation to this strategy is that the EAP estimates are taken as "true" values and the error associated with the uncertainty of the estimates from the measurement model have not been incorporated into the kriging model. This would reflect additional uncertainty in the precision of the kriged estimates.

[31] This would be exhibited as bias resulting for respondents in nearby areas responding similarly to particular items on the perceptions of collective efficacy scale. While such spatial autocorrelation in responses to particular items may be interesting, it remains beyond the scope of the current investigation to consider this possibility. Further, we are aware of no attempt to address this in extant literature.

One of the important considerations for ordinary kriging is the selection of an appropriate model to use for estimating parameters for the empirical semi-variogram. While a number of different models are available, the "stable" model is one of the more flexible models (see ESRI, 2001). The stable model is similar to the more commonly used spherical model (see Atkinson & Lloyd, 2009), but introduces an additional shape parameter for increased flexibility. This model is bounded, meaning that the autocorrelation between points disappears as the spatial distance increases beyond a certain bound. As Atkinson and Lloyd (2009) discuss, this is consistent with many real-world studies. The parameters of this model were estimated using the Geostatistical Analyst extension in ArcGIS (see ESRI, 2001) and interpolations were based on the nearest 20 observations within a fixed radius. Cross-validation was used to assess the accuracy of the interpolated density with all models having a mean predictive error near zero and a standardized root-mean square prediction error near one. In the maps presented here, no adjustments are made for overall surface trends or anisotrophy as it is not entirely clear why these may emerge in the current context; these adjustments may be included in future research efforts.

These kriging models were used to interpolate the spatial distribution of collective efficacy and social cohesion separately for each neighborhood and these interpolated surfaces are presented and discussed in the results. Since scores for both collective efficacy and social cohesion are in the standardized metric (grand mean = 0, standard deviation = 1), we elected to convert the contours to a uniform, seven- category scale ranging from -1.5 standard deviations and below the grand mean to 1.5 standard deviations and above the grand mean. A full standard deviation (-0.5 to 0.5) around the mean was used for the central category and the other categories were set at 0.5 standard deviation intervals. While using only seven value categories (as opposed to finer categories) tends to understate the variability within neighborhoods, the difference

between categories reflects a meaningful shift in the measure across space and avoids the tendency to "overanalyze" what may be slight variation across the spatial surface. To further contextualize the information in the maps, we overlaid the street network, locations of surveyed residents, and locations of homicide incidents from 2007 to 2012 on these maps. While it is possible to obtain maps that present the standard errors associated with the kriged estimates, these have been omitted from this report because our examination is mostly descriptive in nature. Roughly, the standard error is linked to the density of surveyed residents and the locations of these points provide sufficient information about the variability of estimates for descriptive purposes.

Results

The kriging map for collective efficacy and social cohesion in Brownsville is presented in Figure 9. It is clear from these maps that the Brownsville area experiences a considerable amount of homicides. It is also clear from these maps that there is variation in collective efficacy and social cohesion across the sampled area of Brownsville. Collective efficacy falls below the grand mean in a large area near the center of Brownsville. This "sink" in collective efficacy also corresponds to the locations of a number of homicides within Brownsville. A pronounced rise in social cohesion, on the other hand, is apparent in the northwest part of this neighborhood and the southern part of this neighborhood. This rise in social cohesion appears to provide residents of these areas with a buffer against the very high levels of homicide that occur on the fringes of this area. The rise in social cohesion in the northwest section of Brownsville corresponds to the HOPE VI homes, an area of recently built single family residences that replaced public housing. This also appears to provide a buffer for residents against homicides occurring just to the south.

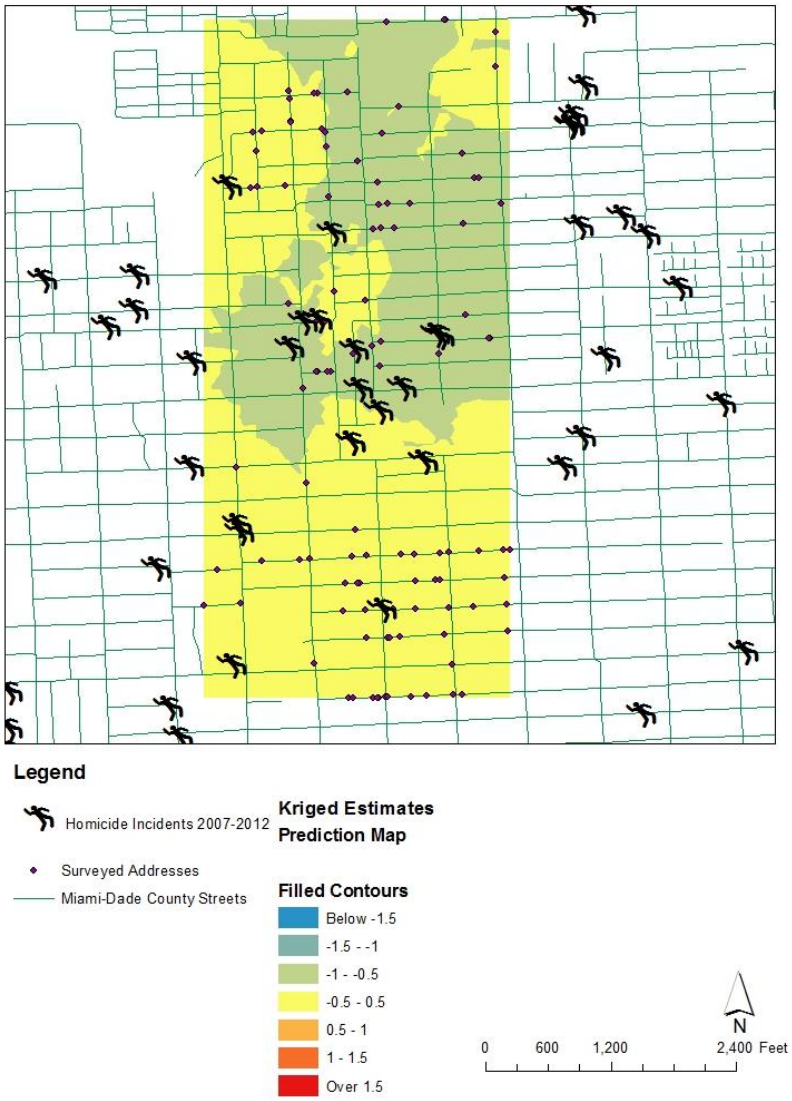
The kriging maps for collective efficacy and social cohesion for the Bunche Park neighborhood are presented in Figure 10. Again, there is considerable variability in neighborhood functioning within this neighborhood. Social cohesion is relatively low throughout the neighborhood with two notable 'sinks', one in the middle and the other in the southeast corner. Collective efficacy shows more variation, with a noticeable 'rise' in the middle of the neighborhood and two prominent 'sinks' to the south of the rise. There appears to be an inverse relationship between collective efficacy and social cohesion as the rises in collective efficacy correspond to sinks in social cohesion.

Although there was only a single homicide observed in this neighborhood, it took place near the park for which this area is named (Bunche Park). It lies in the southeastern corner of this neighborhood. The rise in collective efficacy and sink in social cohesion in the middle of this neighborhood corresponds to an area of single family homes that border an elementary school to the east. This area was hit with a number of foreclosures during the study period; accounting for what we believe is low commitment and a low level of attachment to the community by the homeowners, but a higher willingness to intervene if they see a problem.

The two areas of lower collective efficacy also consist of single family homes with a health center near the middle of this area. The area to the south also reflects single family homes that border the park to the east.

Notably, the low collective efficacy areas of this community experienced substantial amounts of gang activity in recent years. This may explain the observed relationships seen between collective efficacy and social cohesion in these areas. The middle area in the community may reflect an "area under siege" as it borders two gang territories. Residents appear to be effective at mobilizing to prevent the influx of gang activity, but this state of siege has

Collective Efficacy



Social Cohesion

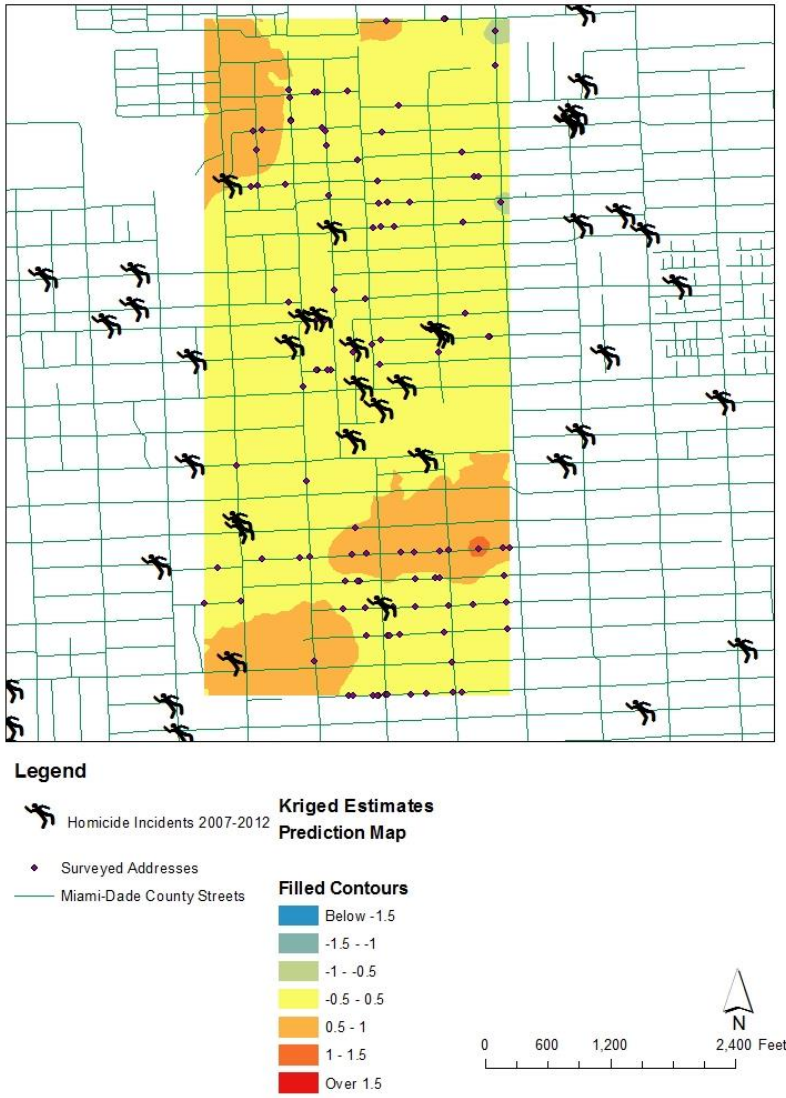


Figure 9. Kriged Estimates for Collective Efficacy and Social Cohesion in Brownsville

Collective Efficacy

Social Cohesion

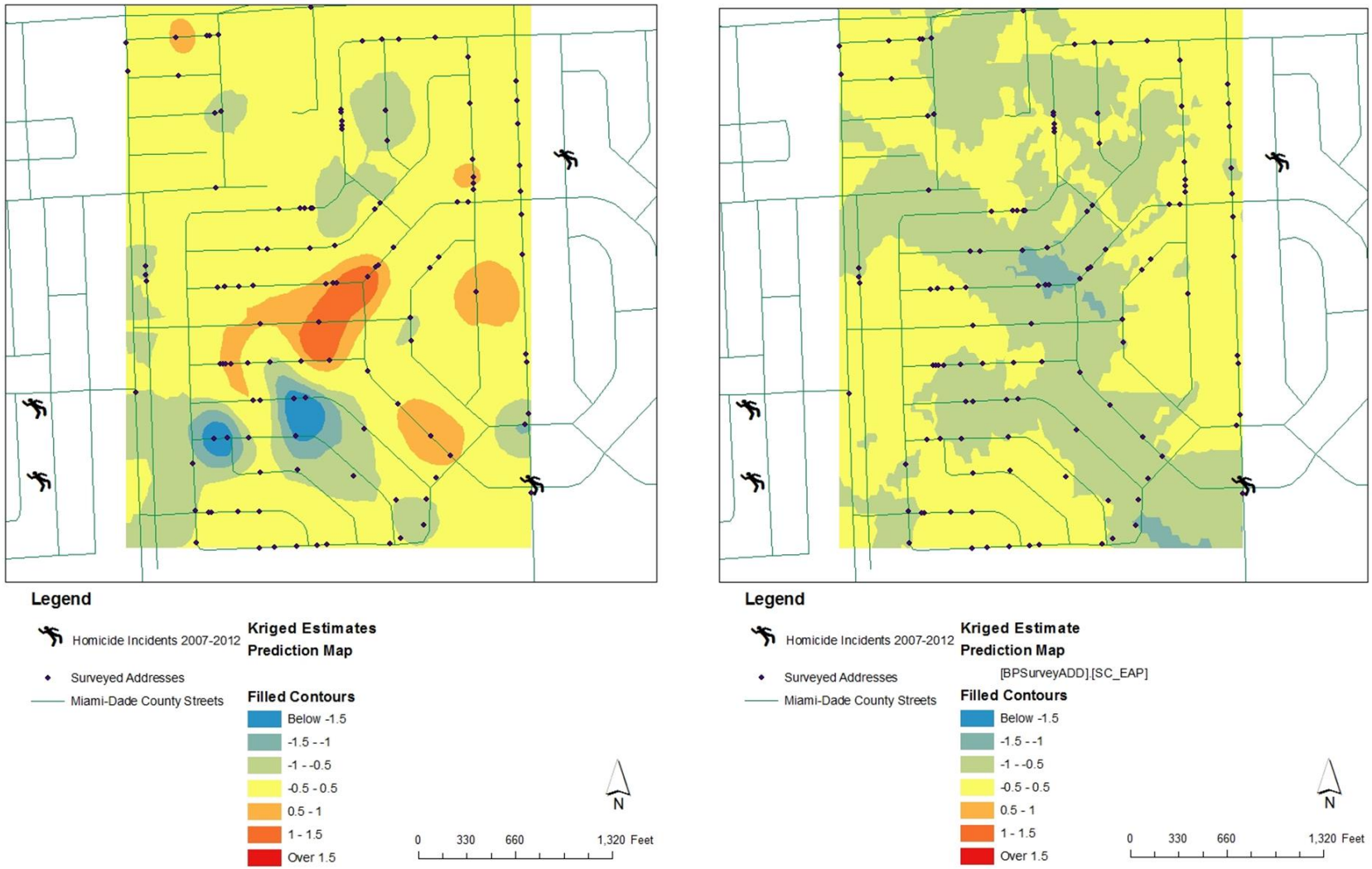


Figure 10. Kriged Estimates for Collective Efficacy and Social Cohesion in Bunche Park

compromised any feelings of attachment and investment in the community by these residents. This further illustrates a point discussed by Sampson (2009, 2012) that high levels of familiarity and social investment in a neighborhood may not be necessary for effective mobilization.

The kriging maps for collective efficacy and social cohesion for East Little Havana are presented in Figures 11. Importantly, the East Little Havana neighborhood consists of the nearly triangular area to the south and west of the Miami River. The interpolated density of the social functioning variables should be ignored in the northeastern section of this map as this reflects an artifact of the kriging process as no surveys were conducted in this area. The homicides that have occurred within this neighborhood appear to be concentrated predominantly in the western area of the community.

Collective efficacy appears to be at approximately mean levels across the eastern and middle portions of this neighborhood, but becomes substantially lower in the western portion of this community. Social cohesion appears to be slightly higher in the middle of this neighborhood and slightly lower in the northwest. The middle section of this neighborhood corresponds to the "heart" of the East Little Havana neighborhood and is the location of a number of commercial establishments as well as a number of long-tenured elderly residents of the community. The commercial establishments include a colorful array of ethnic retail shops and restaurants including bodegas, Cuban coffee shops, and seamstress shops. A hospital and park also lie near the middle of this rise and correspond to the locations with the highest levels of social cohesion in this area of the neighborhood.

Collective Efficacy

Social Cohesion

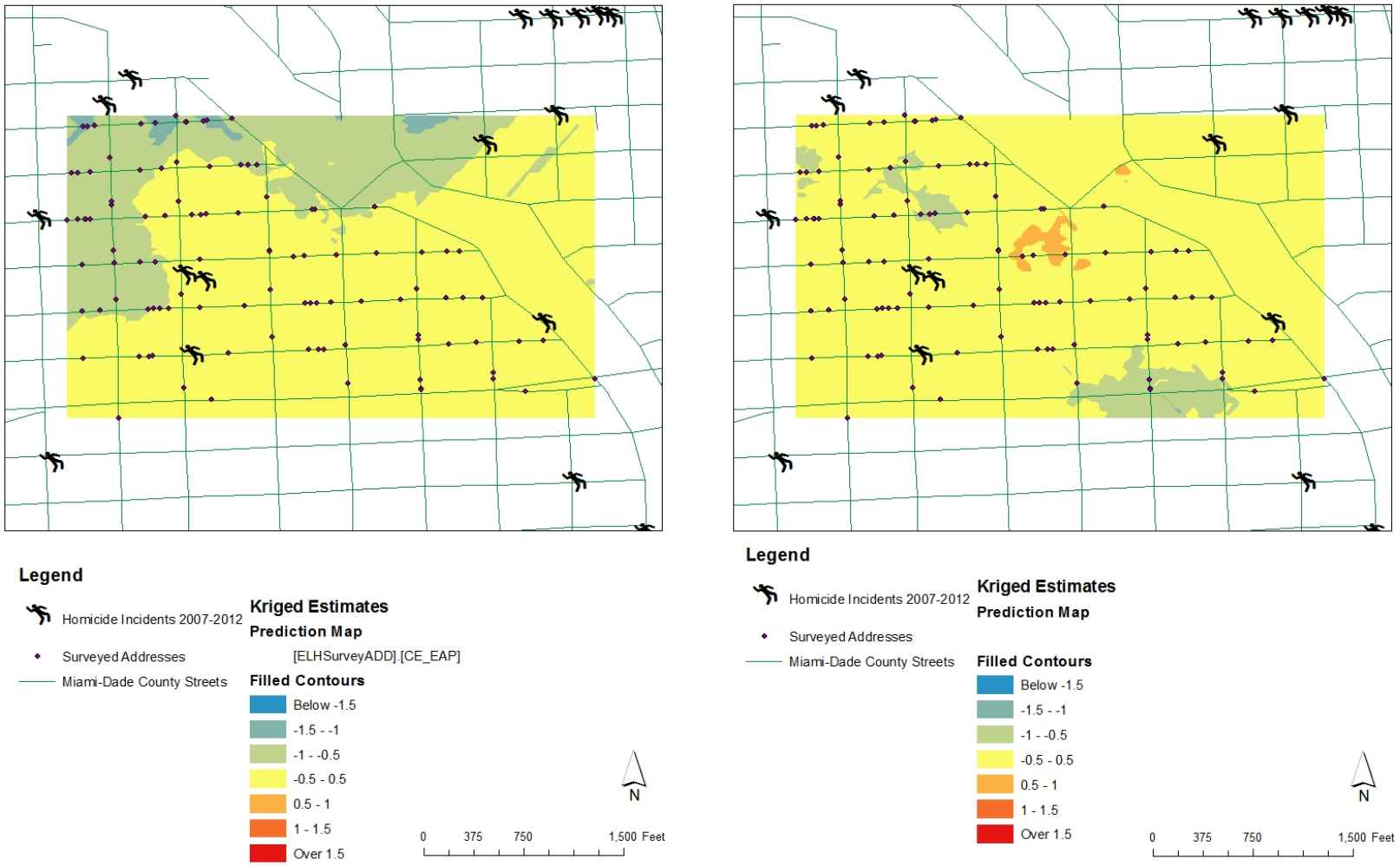


Figure 11. Kriged Estimates for Collective Efficacy and Social Cohesion in East Little Havana

To the east of this rise there is an increased number of poorly maintained houses and areas with high population turnover; however, the levels of collective efficacy and social cohesion do not appear to be substantially decreased. The western area of this community experiences suspected gang activity. The northwestern area appears to be low in both collective efficacy and social cohesion, and it should be noted that the local jail is located directly across the Miami River. East Little Havana is easily accessible by the 12th Street Bridge and is the closest location with any access to food and goods for recently released incarcerated individuals. Though no official studies have been done, police in the area indicate that many of these individuals leave jail and walk directly into the Northwestern section of East Little Havana as an initial regrouping area. This constant influx of individuals may result in the high levels of turnover in the area and the resulting outcome of low levels of collective efficacy.

Figure 12 presents the kriging maps for collective efficacy and social cohesion in Seminole Wayside Park. Again, some caution is necessary for interpreting this map as no residents were sampled from the northwest or southeast quadrants of this area and the interpolated density is simply an artifact of the method used to interpolate the density in the sampled areas. Seminole Wayside Park itself lies in this northwestern quadrant of the neighborhood and the unsampled area to the south houses a church, a middle school, and an Air Force Vocational school. Overall, Seminole Wayside Park is primarily residential with moderate income households. The majority of the neighborhood is single family homes, with a few street segments containing two-story duplexes. Most of the homes are tract houses, built fairly recently. The area has a limited number of commercial establishments, including a few places of worship. Importantly, this neighborhood was devastated by Hurricane Andrew in 1992 and has only recently been re-established.

Collective Efficacy

Social Cohesion

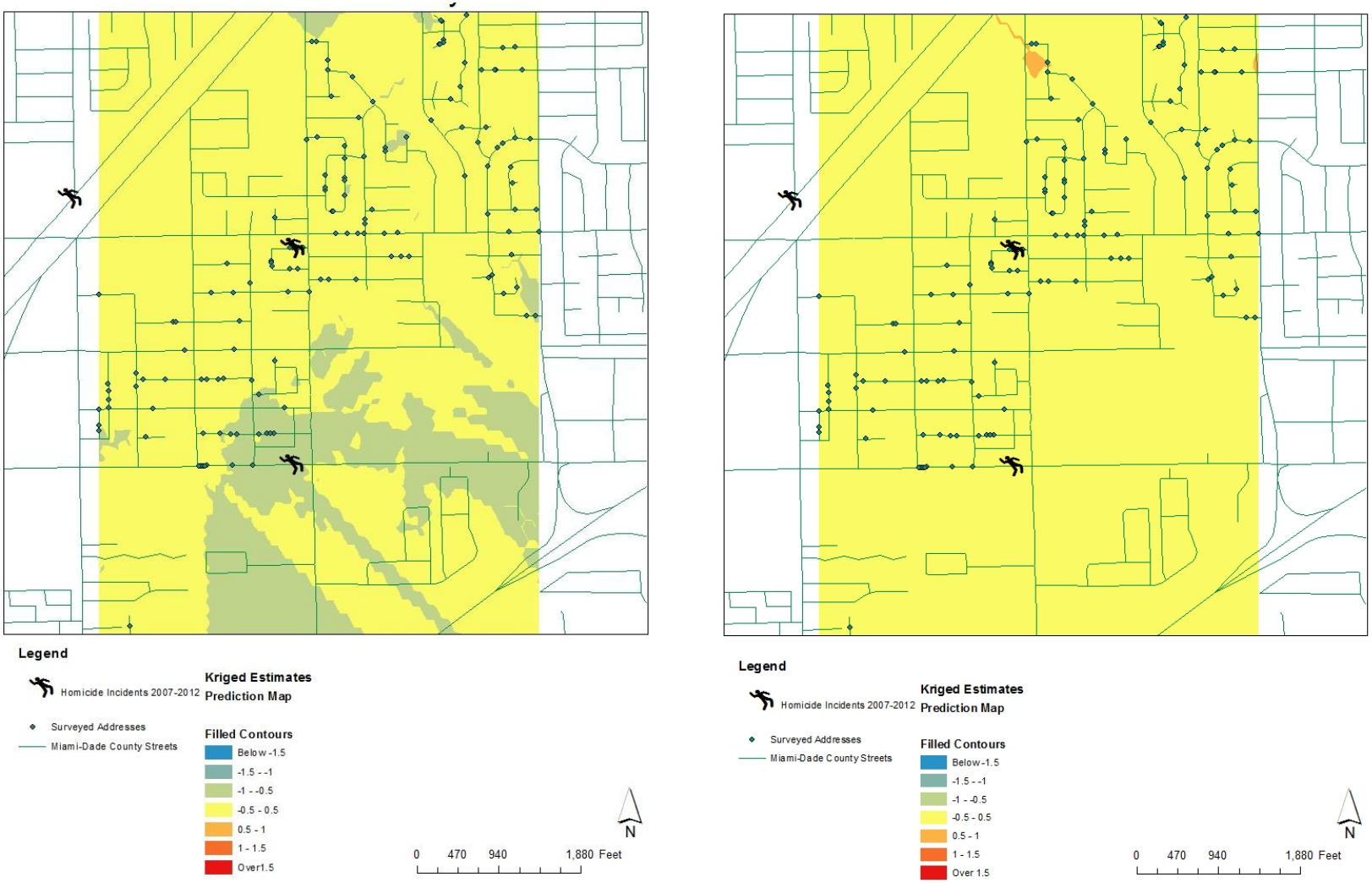


Figure 12. Kriged Estimates for Collective Efficacy and Social Cohesion in Seminole Wayside Park

There were only two homicides in the Seminole Wayside Park neighborhood and one of these occurred in the low collective efficacy region in the south of the sampled residential area. From the systematic social observations of this area, the research team noted that this section of the neighborhood seemed very different than the rest of the neighborhood and less safe. This area had street segments with visible litter, vacant homes and a suspected gang presence, as identified through graffiti markings on the street signs and fences. Though the neighborhood appears to be a "planned community" comprised of tract-style homes and arranged, interwoven cul-de-sac streets and a park, it lacks other community assets such as grocery stores, government services and community gathering locations. The absence of these neighborhood cornerstones may be impacting the levels of collective efficacy and social cohesion.

Figure 13 presents the kriging maps for collective efficacy and social cohesion in Kendall Hammocks Park area. Again, some caution is necessary for interpreting this map as no residents were sampled from the middle of this area. Kendall Hammocks Park itself lies in the northeastern quadrant of the neighborhood. Obtaining information from residents in the Kendall Hammocks Park area was difficult because the communities here are 'gated' and individual houses have security gates and private security guards who patrol the areas throughout the day. There appears to be a rise in collective efficacy in the southwest corner of the neighborhood and a sink in the southeast corner. There also appears to be a rise in social cohesion in the northwest corner of this neighborhood and a sink in the northeast and possibly the southeast, although this area lies mostly in an unsampled area of the neighborhood.

The northwest area has a number of single family homes with nicely manicured lawns. The high levels of social cohesion in this area likely reflect the high level of investment that

Collective Efficacy

Social Cohesion

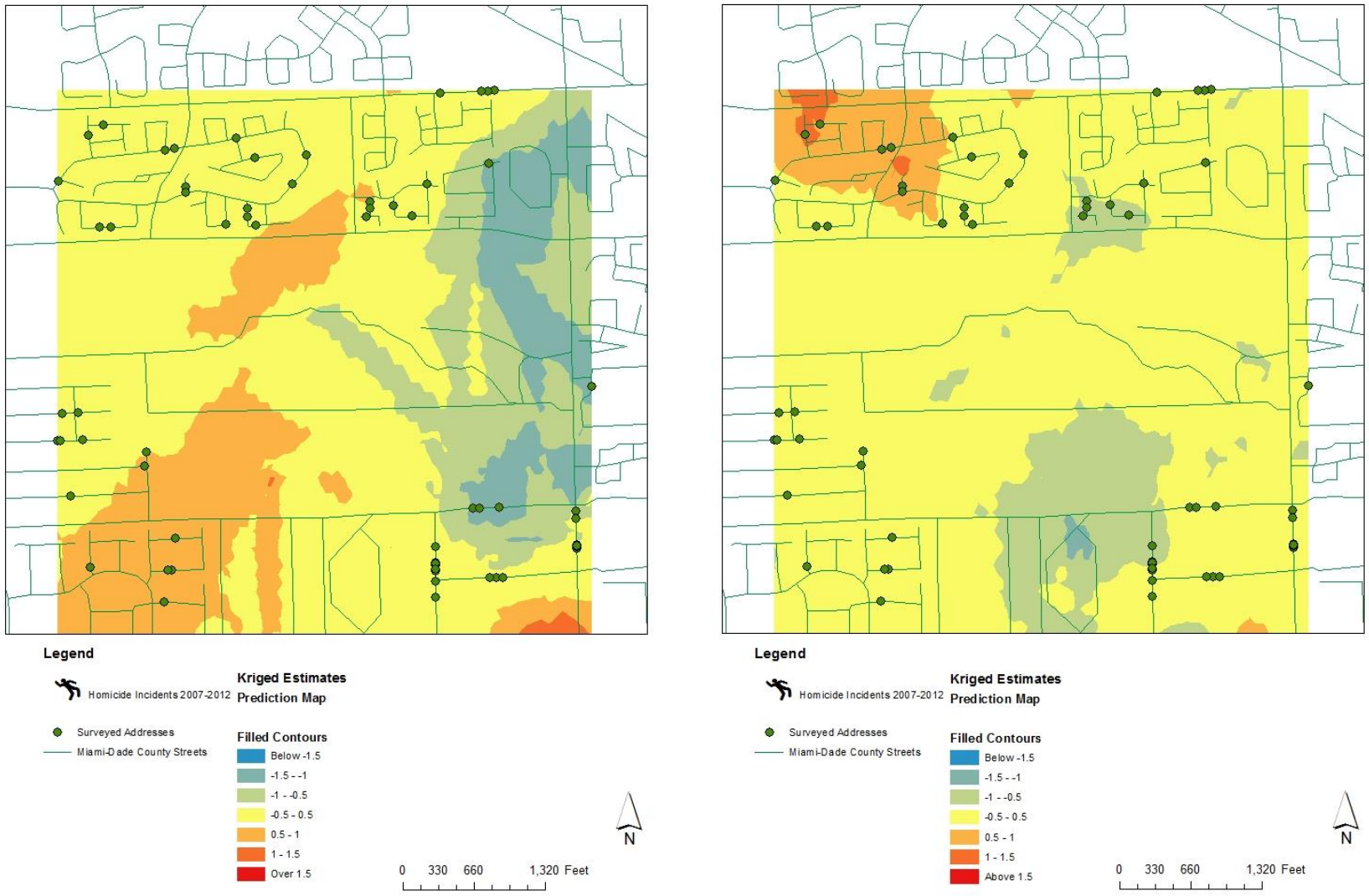
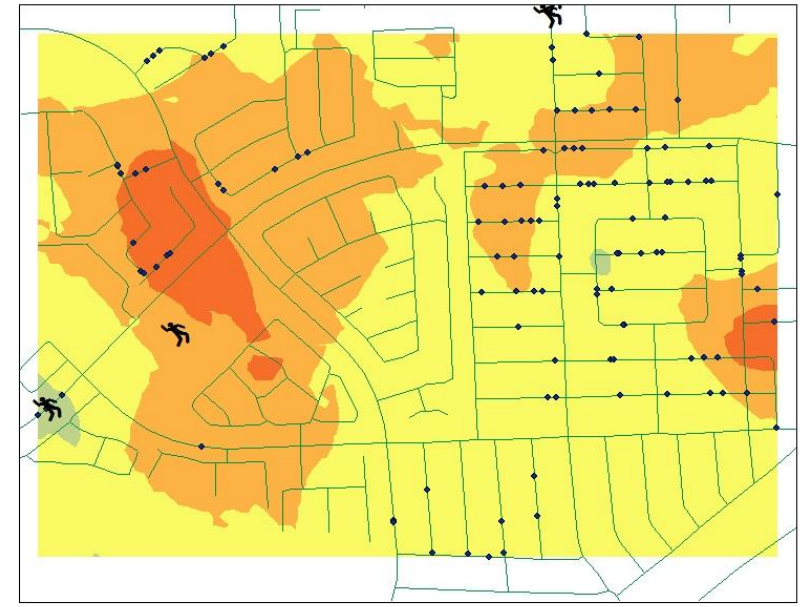


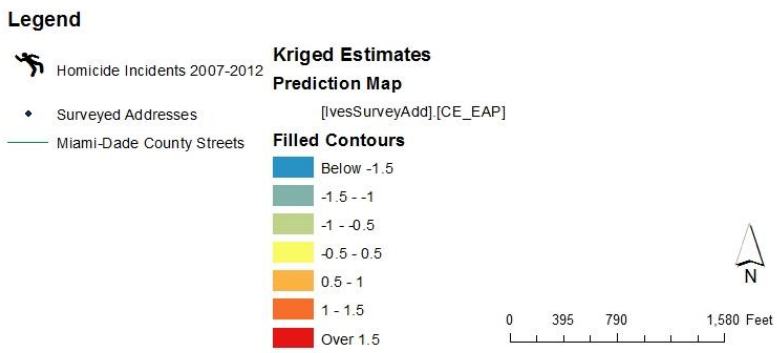
Figure 13. Kriged Estimates for Collective Efficacy and Social Cohesion in Kendall Hammocks Park

these residents have put into this area. Interestingly, both the border with the park and pattern of the street networks serves to effectively close this area from other parts of the community. The northeast corner borders the park, but numerous multi-story rental apartment complexes are located here.The pocket of low social cohesion likely reflects the residential turnover in this area. Next to these homes on the west side is a gated townhouse community, an area that did not permit us to conduct our survey, which may serve to understate the level of collective efficacy in this area. The southeastern area is home to the Kendall Campus of Miami-Dade College and a very large church. The southwestern side, characterized by high levels of collective efficacy, is comprised of well-manicured single family homes, both ranch-style and two story. These homes have yards and no fences or gates. Most of the homes in this area were built within the past ten to fifteen years. Kendall Drive/SW 88th Avenue runs east to west and is characterized as a major shopping area with numerous big-box stores, chain restaurants, grocery stores, and retail strip malls. Kendall Hammocks Park area has not experienced any homicides but does have high rates of burglary and burglary/theft from motor vehicles.

Figure 14 presents the kriging maps for collective efficacy and social cohesion in Ives Dairy Estates. Again, some caution is necessary for interpreting this map as few residents were sampled from the southwest quadrants of this area. Ives Dairy Estates primarily consists of single family homes with a few garden-style apartment complexes. Most of the housing stock in the area consists of older houses built in the late 1960s and early 1970s though some new developments with townhouses have been added more recently. The northern border is the county line that is shared with Broward County; to the west and immediately outside of the boundary is a strip mall with a grocery store and discount movie theater; Interstate 95 and the railroad tracks are approximately one-quarter to one-half mile to the east.

Collective Efficacy





Social Cohesion

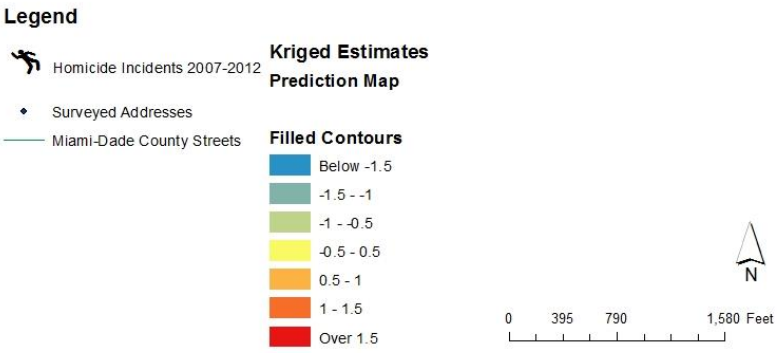


Figure 14. Kriged Estimates for Collective Efficacy and Social Cohesion in Ives Dairy Estates

Toward the northeast, is a large park, Ives Estates Park. In the southeast, are commercial businesses including a limousine company, a discount bridal shop, a furniture warehouse store, auto repair store, and gas station as well as a very large church. In the area to the south lies a strip mall with medical dialysis services, a beauty salon and small food store; within the area is a smaller park and an office complex with medical and other professionals.

Ives Dairy Estates has sizable areas that appear to have high collective efficacy. In the southwestern section of the western rise in collective efficacy is a complex surrounded by a ten-foot wooden fence with gated entrances for residents only. The northeastern section is made up of larger single family homes with open access. The area to the northeast with higher collective efficacy is also an area of large single family homes with open access surrounding an elementary school. As discussed above, this area was developed in the 1970s and has many limited access features, including but not limited to the large wooden fence around the central complex. Other features include cul-de-sacs and barrier roads that prevent traffic from entering from the main thoroughfare except at designated intersections. Two sections within Ives Dairy Estates appear to be sinks for social cohesion; however, very few residents were sampled within the areas in question and these sinks may be nothing more than a sampling artifact. It is worth noting, however, that during the observation efforts, we did observe some youth walking in groups through the areas with low social cohesion in the evening hours.

Figure 15 presents the kriging maps for collective efficacy and social cohesion in Auberdale. Auberdale is located in middle of the county, near Little Havana. On the east and south, it is bordered by 27th Avenue and Flagler Street which are major thoroughfares with numerous commercial strip malls, small office buildings, fast food establishments and chain stores such as Walgreens. Flagler Street also has a number of single and two-story multi-unit

buildings that appear to be duplexes, triplexes, and quadplexes as well as small motels. The western border is primarily residential but located immediately across the street is a medium sized casino. To the north of the area is State Road 836 or "The Dolphin," the main highway into Miami.

There is a rise in collective efficacy in the southwestern section of Auberdale and a sink in collective efficacy in the north central section of the neighborhood. There is a rise in collective efficacy in the southwest of Auberdale and a sink in the north central area of the neighborhood. The distribution of social cohesion in Auberdale appears more complex as there are five observable rises in social cohesion and one apparent sink. However, many of these rises appear to be artifactual as there were few sampled residents, particularly in the northern rises and the rise in the southeast. A substantial rise does appear in the southwest corner bordering Flagler Street with a sink lying just to the north of this area. The physical environment does not offer many clues to understand these differences. The southwestern section has many small houses with bars on the windows and/or wrought iron or utility fences. These houses are placed on small lots close together and have small front and back yards, many of which have been converted to paved driveways. A homicide occurred in this area of high collective efficacy and social cohesion. Moving from the southwestern corner to the northeastern corner, the house and lot sizes increase in size but do not improve in appearance. However, there are fewer bars on the windows and fenced yards in the northeastern section. All of the housing stock is old and the physical appearance is maintained but not well manicured. In the area with low

Collective Efficacy

Social Cohesion

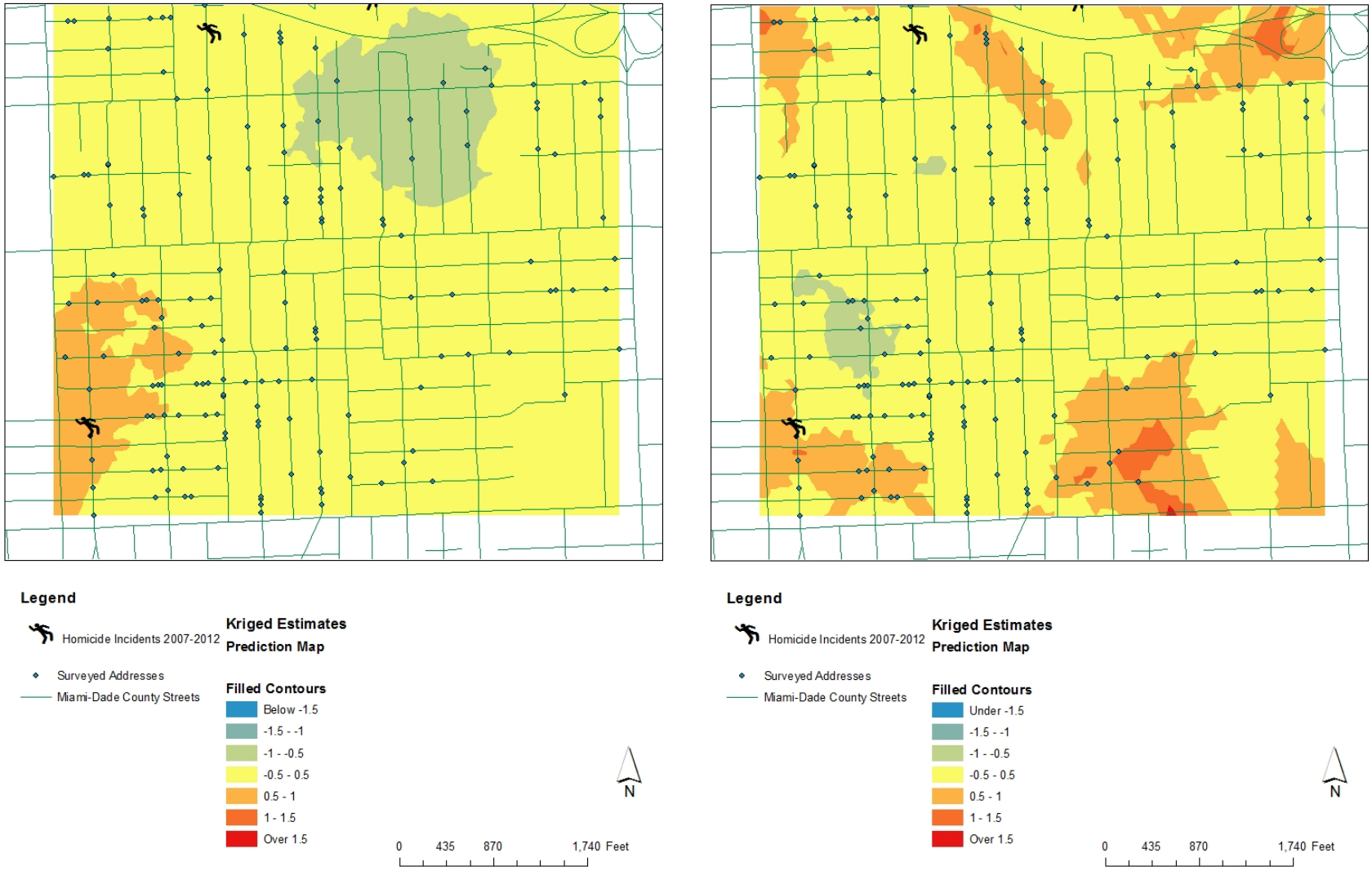


Figure 15. Kriged Estimates for Collective Efficacy and Social Cohesion in Auberdale

collective efficacy, we did observe multiple fences and sides of buildings with graffiti though it is not clear whether it is gang-related graffiti or merely tagging. From discussions with residents in this area, the homicide incident in the southwest galvanized this community and led to efforts at community mobilization. This process may explain why collective efficacy and social cohesion appear substantially higher than other sections of Auberdale.

Figure 16 presents the kriging maps for collective efficacy and social cohesion in Coral Reef Park. Coral Reef Park is the most affluent neighborhood we studied, and collective efficacy and social cohesion both appear high. Coral Reef Park is bordered on the west by South Dixie Highway, a major thoroughfare for Miami-Dade County. This area has strip malls with fast food restaurants, grocery stores, a car dealership and smaller retail stores. Near South Dixie Highway, there are several two- to four-story condominiums and a garden style apartment complex. The area also has a street with a few modern duplexes.

In the east near Coral Reef Park itself, the housing stock shifts to large ranch-style single family homes built in the late 1960s and early 1970s. There appears to be a pattern of housing stock renewal in Coral Reef Park as newer two-story homes are interspersed. All homes are situated on large plots of land with well-manicured lawns. The homes become substantially larger and the area more affluent towards the east. On the eastern border of Coral Reef Park lies a number of gated mansion-type homes located directly on the bay. At the far southeastern corner is Coral Reef Park, a very beautiful park with a walking path, well-maintained child play areas, tennis courts, and baseball fields. Coral Reef Elementary School is located next to the park. Beyond the southern boundary of Coral Reef Park is a new neighborhood of large single family homes built in the late 1980s and early 1990s.

To some extent, levels of collective efficacy appear to increase as the housing values increase to the east and south of the area and social cohesion appears strongest in the east. This area has the most uniform housing make up and is somewhat isolated as indicated by cul de sac streets. During the 2007-2012 time period, Coral Reef Park experienced one homicide, which was domestic violence- related.

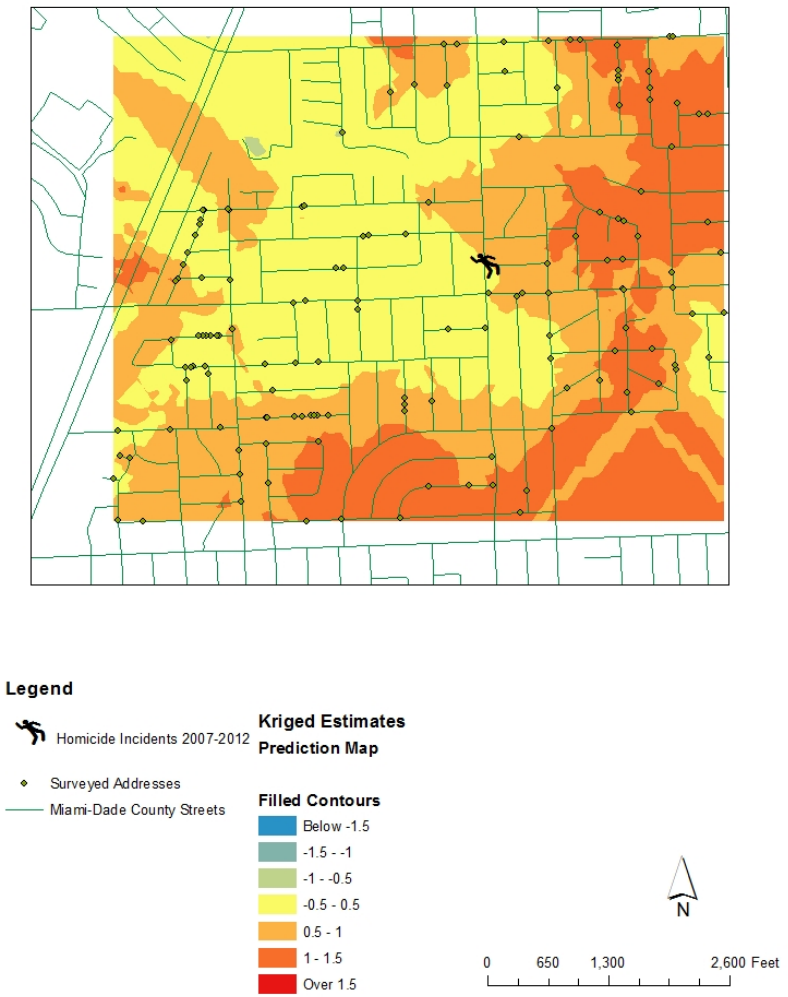
Conclusions

The kriging technique helps us identify the variation of collective efficacy and social cohesion within neighborhoods. In all eight areas we identified local spatial variation in these dimensions of neighborhood functioning. We saw clear rises and sinks in collective efficacy and social cohesion within neighborhoods. Within five neighborhoods (Bunche Park, Kendall Hammock Park, Ives Dairy Estates, Auberdale and Coral Reef Park) an area the size of a few city blocks were shown to have higher than average levels of collective efficacy (between 0.5 and 1.0 standard deviations higher than the grand mean across neighborhoods). Bunche Park, Ives Dairy Estates and Coral Reef Park all exhibited smaller areas with even higher levels of collective efficacy (between 1.0 and 1.5 standard deviations above the grand mean). Six areas (Brownsville, Bunche Park, East Little Havana, Seminole Wayside Park, Kendall Hammocks Park and Auberdale) had small areas with low levels of collective efficacy and two areas (Bunche Park and Kendall Hammocks Park) included blocks with very low collective efficacy. Interestingly, three areas (Bunche Park, Kendall Hammocks Park and Auberdale) had both areas with high and low levels of collective efficacy.

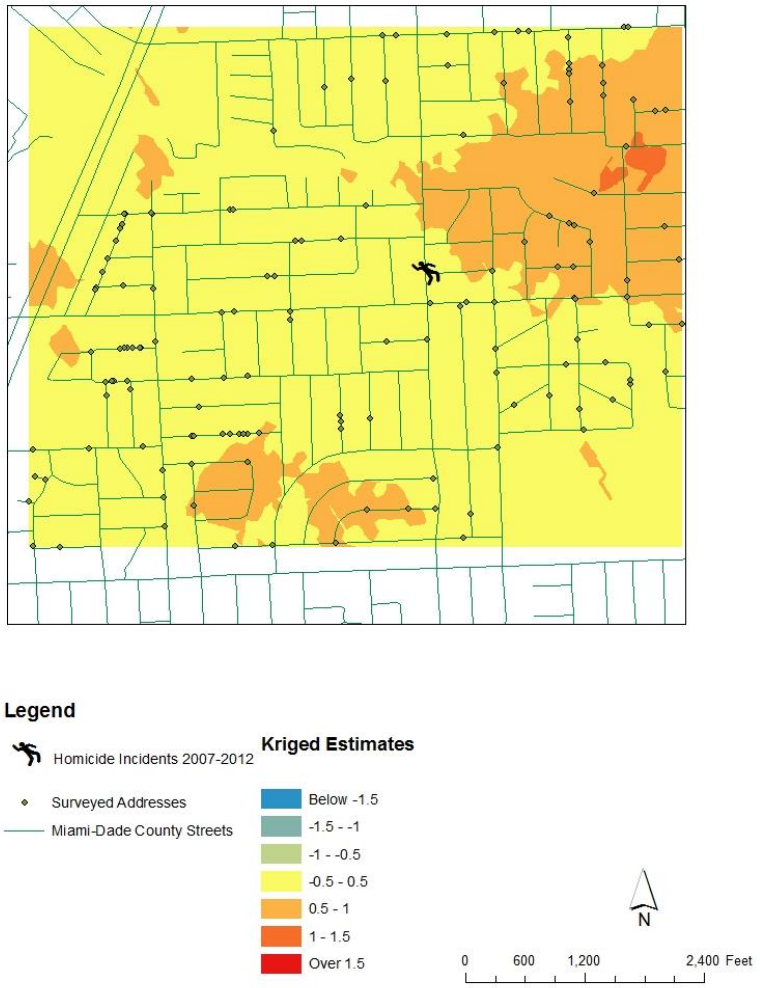
Variation with respect to social cohesion was not as large. Four areas (Brownsville, Seminole Wayside Park, Auberdale, and Coral Reef Park) showed notable rises in social cohesion. Low levels of reported social cohesion were recorded in five areas (Bunche Park, East

Figure 16. Kriged Estimates for Collective Efficacy and Social Cohesion in Coral Reef Park

Collective Efficacy



Social Cohesion



Little Havana, Kendall Hammocks Park, Ives Dairy Estates and Aurberdale) with very low reported levels of social cohesion in three areas (Bunche Park, Kendall Hammocks Park and Ives Dairy Estates). Both Kendall Hammocks Park and Auberdale showed both high and low levels of social cohesion within the targeted areas.

These results demonstrate that there is considerable local variation in collective efficacy and social cohesion within neighborhoods. Interventions and efforts to address community issues should mirror these variations to achieve the benefits effectively. Further, we can see from these results that variation in collective efficacy and social cohesion do not necessarily coincide. Two distinct social processes appear to be at work. Bunche Park provides a great illustration of this as the area with the highest collective efficacy has the lowest level of social cohesion observed in the neighborhood. The observed spatial surfaces can also intersperse as they do in Kendall Hammocks Park with the areas of high collective efficacy bordering areas of low social cohesion.

To explain the variation in collective efficacy and social cohesion, we focused on the physical space and variations in land use (e.g., housing quality, features of space, and residential tenure). Based on these initial descriptions, it appears that patterns in these characteristics coincide with the observed distribution of collective efficacy and social cohesion. Though policy makers do not often recognize it and researchers rarely acknowledge it, administrative neighborhoods often have many distinct smaller areas within them, characterized by planned housing complexes and natural land use breaks. As such, these features of space serve to structure the social lives of residents even within neighborhoods and communities. It is important to emphasize that this effort remains preliminary and with the use of advanced geospatial statistics, these patterns can be more thoroughly examined.

Finally, though the pattern is sparse given the rarity of the events, visually it appears that homicides seem to occur in or near sinks in collective efficacy or social cohesion. We will include other crime patterns in future research as they may be more revealing and provide greater insights. Again, although this work is preliminary this finding provides a strong rationale for examining the distribution of collective efficacy, social cohesion, and crime within neighborhoods.

CHAPTER VIII. CONCLUSIONS AND DISCUSSION FOR FUTURE RESEARCH

Summary of Findings

The current report offers a comprehensive examination into the concept of collective efficacy and the related social construct of social cohesion in Miami-Dade County. Through funding made available by both the National Institute of Justice and The Children's Trust of Miami-Dade, eight neighborhoods were selected for inclusion into this study based on a number of characteristics including socioeconomic status, racial and ethnic composition, geographic location within the county, and relative level of crime. These eight neighborhoods were selected to reflect the diversity in neighborhoods across Miami-Dade County. We used a variety of digital mapping resources and site visits to ensure that the boundaries of these neighborhoods reflected the social cues, such as land use, roadways, and waterways, which are often used to delineate residential areas into shared social spaces such as neighborhoods. Leveraging information obtained from a private vendor reflecting the most accurate and current list of mailable addresses available, a simple random sample of approximately 150 residents was selected for participation in face-to-face community surveys. Although not used extensively in this report, research staff also conducted systematic social observations of street segments in these eight neighborhoods.

Using these data, the first set of analyses examined the psychometric properties of the Sampson et al. (1997) scale that is currently the most commonly used measure of collective efficacy. Examining responses at the individual (psychometric) level is important as problems with the specification of the model at this level likely propagate to the aggregate (ecometric) level and result in inefficiency and bias in the measure. An expanded perceptions of collective efficacy scale was developed by incorporating additional questions corresponding to the three

main question domains in the original scale: willingness to intervene, social cohesion, and capacity for social control.

Investigations into the psychometric properties of this scale yielded some important findings. First, when examining the dimensionality of the scale using a bifactor item-response theory model, a clear second dimension in the measure emerged. This second dimension corresponded to the group factor for social cohesion and was incorporated into the additional analyses used in this report. When constructing the scale, it became apparent that particular items in the measure exhibited either considerable differential item functioning across racial/ethnic groups or a substantial degree of local item dependence. These items were removed from the construction of the final scale and the resulting 20 items were scored across the general dimension and the three group dimensions of the scale, perceptions of collective efficacy, willingness to intervene, social cohesion, and capacity for social control. Examining scale information plots and plots of EAP scores against posterior standard deviations revealed that only two dimensions***, perceptions of collective efficacy and perceptions of social cohesion***, showed sufficient precision to warrant consideration as measurement dimensions. Further, these plots also revealed that there were important limitations in the information of the scale across the range of the latent variables examined. Specifically, the precision of the perceptions of collective scale was limited at higher ranges of collective efficacy (beyond one standard deviation) and the precision of the perceptions of social cohesion scale was limited near the mean (between +/- 0.5 standard deviations). Finally, examinations of differential item functioning using the multiple indicators-multiple causes (MIMIC) approach suggested that even though the bifactor model showed clear improvement over the unidimensional model, there was still important differential

item functioning effects for race/ethnicity, particularly for items in the social cohesion dimension.

Finding an additional latent dimension in the perceptions of collective efficacy scale suggested further exploration into the relationships between perceptions of collective efficacy and perceptions of social cohesion with other theoretically important outcome variables. Using additional information from the resident surveys, a structural equation model was constructed to examine the relationship between perceptions of collective efficacy and perceptions of social cohesion with three theoretically important outcome variables: perceptions of incivilities, satisfaction with the police, and fear of crime. This model used correlated errors, similar to Seemingly Unrelated Regression (or SUR), to control for the unmodeled correlations between these variables and incorporated instrumental variables for the outcomes to attempt to address endogeneity. The results of these analyses revealed that both perceptions of collective efficacy and perceptions of social cohesion carried significant negative relationships with perceptions of incivilities; however, the relationship between perceptions of social cohesion and perceptions of incivilities appeared much stronger. Both perceptions of collective efficacy and perceptions of social cohesion carried statistically significant, positive correlations with satisfaction with the police and the magnitude of these relationships were similar. Finally, the relationship between perceptions of social cohesion and fear of crime was statistically significant, but the relationship between perceptions of collective efficacy and fear of crime was not.

After finding that the relationships between perceptions of collective efficacy and perceptions of social cohesion with the three outcome variables showed substantive differences, further analysis examined whether these relationships were consistent when examining each neighborhood separately. Swatt et al. (2013) found variability in the relationship between

collective efficacy and fear of crime across four of the neighborhoods examined in this report. However, Swatt et al. (2013) did not decompose the measure of perceptions of collective efficacy into the two measures for perceptions of collective efficacy and perceptions of social cohesion using the bifactor IRT measurement model. Therefore, it remained to be seen whether variability is observed across all eight neighborhoods, as well as whether variability is observed with both perceptions of collective efficacy and perceptions of social cohesion.

The results of these analyses indicated considerable variability in the relationships between neighborhoods for perceptions of collective efficacy and social cohesion with many of these outcome variables. The relationship between perceptions of collective efficacy and perceptions of incivilities was only statistically significant in Brownsville and Ives Dairy Estates; while the relationship between perceptions of social cohesion and perceptions of incivilities was only statistically significant in, East Little Havana, Seminole Wayside Park, Ives Dairy Estates, and Auberdale,. Perceptions of collective efficacy was significantly associated with satisfaction with the police in Ives Dairy Estates and Coral Reef Park; while the relationship between perceptions of social cohesion with satisfaction with the police was only statistically significant in East Little Havana, Ives Dairy Estates, Auberdale, and Coral Reef Park. Finally, the relationship between perceptions of collective efficacy and fear of crime was statistically significant and negative for Kendall Hammocks Park, Ives Dairy Estates, and Coral Reef Park. The relationship between perceptions of collective efficacy and fear of crime was statistically significant and positive in Seminole Wayside Park. The relationship between perceptions of social cohesion and fear of crime was statistically significant for Brownsville, East Little Havana, and Seminole Wayside Park. These results demonstrate substantial heterogeneity in the strength, size, and in one instance direction of the relationships across neighborhoods.

We conducted an analysis to explore the finding that perceptions of collective efficacy and perceptions of social cohesion appear conceptually distinct. In addition to the control variables used in the prior structural equation model, several additional questions regarding specific activities and frequency of use of particular neighborhood resources were incorporated into separate models for perceptions of collective efficacy and perceptions of social cohesion. Bootstrapped OLS models were used to correct for clustering of respondents within neighborhoods. We found limited overlap between the variables that carry significant relationships with perceptions of collective efficacy and perceptions of social cohesion. Higher perceptions of collective efficacy was associated with knowledge of community meetings, more frequent use of neighborhood grocery stores, and more frequent use of neighborhood parks. Higher perceptions of social cohesion was associated with participation in volunteer activities within the neighborhood, higher frequency of use of neighborhood medical facilities, higher frequency of use of neighborhood parks, and home ownership.

Finally, we considered whether there was local variation in the distribution of collective efficacy and social cohesion within neighborhoods. Since prior research has not explored this issue with much depth, we introduced the conceptualization of neighborhood social functioning as represented by a continuous multivariate surface that varies across a neighborhood. Similar to the methods of assessing the density of rainfall, individual respondents were conceived as a realization of the measurement of neighborhood social functioning. By conceptually linking an individual's awareness space with the reliability of reports of neighborhood social functioning (i.e., perceptions of collective efficacy and social cohesion), we argued that the contribution of an individual's report of neighborhood social functioning should decrease as a function of the distance from the respondent's household. We assessed the local density of neighborhood social

functioning by linking the responses with spatial measurements of the location of these points. Adapting a technique used in geostatistics called kriging, we estimated the degree of similarity between measures as a function of distance and interpolated a smooth spatial surface that reflected the local density of social functioning across a neighborhood. This was done for both collective efficacy and social cohesion for each of the eight neighborhoods under investigation.

Our results showed considerable local variation in both collective efficacy and social cohesion across all eight neighborhoods. The kriging maps demonstrated an ability to identify both rises and sinks in social functioning variables across each neighborhood. We further conducted some exploratory descriptive analyses by attempting to link the locations of rises and sinks with features of space (housing stock, residential tenure and instability, defensible space mechanisms, and property upkeep) that may explain the observed patterns. Although this work is exploratory, interesting linkages between these features of space and collective efficacy and social cohesion were apparent. We also considered the distribution of homicides from 2007 to 2012 and its overlap with local variation in collective efficacy and social cohesion. Since homicide is a rare event, these patterns are slight, yet there still appears to be some tantalizing hints on how the distribution of collective efficacy and social cohesion shapes crime patterns within neighborhoods.

Recommendations for Future Research

As with any research endeavor, we offer a number of specific directions for future research on collective efficacy, social cohesion, and neighborhood functioning. These recommendations arise from a number of specific issues, such as questions that remained unaddressed by the current research, limitations of the current research, or new directions worth

additional investigation by subsequent studies. A number of specific recommendations are discussed below.

1. Improve and develop the expanded measure of collective efficacy.

The expanded measure of collective efficacy represents an improvement over the original set of items used by Sampson et al. (1997). Based on the current research, much more is known about the dimensionality, precision, and existence of differential item functioning of this expanded scale. However, based on the current results, there would be considerable benefit in further development of this measure. First, there are clear limitations in the precision of the measure across the domain of the latent variable. This is a consequence of the high mean of the items and the limited number of response categories above this mean. As currently constructed, this measure yields a large number of "agree" responses to many items. This in turn would suggest that items with a higher "difficulty" should be included; *i.e.*, items where the average responses are much lower. Further, these items should demonstrate a greater ability to discriminate between responses for individuals with high perceptions of collective efficacy. A different problem exists for the perceptions of social cohesion as there is a clear inability to distinguish between responses near the mean of the latent variable. The only available strategy to correct for these issues would be to consider adding more items to the scale and further testing of these new items.

Another problem with this scale is the finding of considerable remaining local item dependence. Although steps were taken to minimize this problem, there still appears to be substantial redundancy between items even after controlling for the general factor and three group factors for item domains. Another problem is the continued existence of differential item

functioning for racial/ethnic groups. While an attempt to minimize this problem was taken by eliminating items that showed considerable DIF effects across groups in a univariate model, problems still remain. Although the bifactor MIMIC analysis revealed less DIF for items compared to the univariate MIMIC model, there were still notable DIF effects, particularly with items from the social cohesion domain. Again, the strategy for addressing both these issues is still to add new items to the scale and further search for the best performing items for an optimum scale. In short, while the current study represents an advance in the measure of collective efficacy, further improvements using a similar strategy are needed.

It also remains to be seen what the consequences of these findings hold for other studies of collective efficacy. First, it is unknown whether a similar multidimensional solution exists for the original measure in the PHDCN. It is quite possible that the multidimensionality observed in these data is a result of using the extended scale rather than the original scale. It is also quite possible that the multidimensional nature of this measure is a consequence of the unique nature of the sample at hand. Miami-Dade County, Florida has a much higher concentration of Hispanic/Latino residents compared to Chicago, Illinois and language and cultural differences between these two areas may account for the observed multidimensionality in the scale.

2. Distinguish between collective efficacy and social cohesion in terms of their respective causes and consequences.

One of the key findings from this report is the existence of a previously unexplored latent factor in the perceptions of collective efficacy scale -- *perceptions of social cohesion*. The manner in which this variable is constructed entails that this variable represents the part of the items from the social cohesion domain that are not part of perceptions of collective efficacy.

Further analyses reveal that this group factor is distinct from perceptions of collective efficacy in terms of its relationships with key outcomes and predictors. Further, this variable appears to exert consistently significant effects across outcomes, suggesting that it represents an important construct. The question then remains, what does this variable represent other than a mathematical construct resulting from the bifactor IRT model used to create this dimension? To answer this question involves considerable more theoretical effort.

We offer an initial attempt to specify this concept based on the results of the analyses presented in this report. From our results, the perceptions of collective efficacy dimension reflects a single latent variable constituted from all three subscales: perceptions of willingness to intervene, social cohesion, and the capacity of social control. Following prior research on collective efficacy, this dimension can be understood as the ability of a community to marshal social control to intervene on behalf of the common good. Perceptions of collective efficacy merely represent an individual's assessment of the capacity of a community to address shared problems and concerns. Given that the perceptions of willingness to intervene and capacity for social control dimensions loaded very strongly on this single factor, yet comprise a diverse set of indicators, collective efficacy should be seen as a *general* capacity - not specifically geared towards crime control issues. Further supporting this argument is the breadth of correlations of collective efficacy with other neighborhood outcomes (see Sampson, 2012).

More difficult to conceptualize is the perceptions of social cohesion dimension. The analyses demonstrated that the social cohesion items contribute to the construct of collective efficacy; however, these items had much smaller loading than the willingness to intervene or capacity for social control items. The remaining variation common only among items in this domain constitute a separate dimension in the collective efficacy scale. The issue, then, is how to

interpret the remaining commonalities among the items in social cohesion after its contribution to collective efficacy is removed. To put it another way, what part of social cohesion remains after working trust among residents is removed?

Cancino (2005) argues that social cohesion is more similar to the concept of social capital and should be conceived as separate from collective efficacy. Specifically, Cancino (2005) argues that social cohesion (or social capital) represents the neighborhood resources of relationships of shared trust that can be leveraged to accomplish shared goals. Collective efficacy, on the other hand, represents the modes of action or agency, whereby these resources are translated into informal social control. This distinction is helpful as it separates the concepts of collective efficacy and social cohesion into separate, but related, dimensions of neighborhood functioning. This argument can be extended to understand why only part of the correlation between social cohesion items are explained by perceptions of collective efficacy. In order to sustain efforts for addressing community problems, it is required that there exists some shared values, working trust, and an agreement about what the common good of the community represents. However, it may be useful to conceptualize this as a threshold, *i.e.*, that there is a minimum level of social cohesion required for mobilizing to address common problems. Once this minimum level of social cohesion is met, the neighborhood's collective willingness to intervene and capacity for marshaling social control become more critical for successfully meeting shared goals.

However, there is more to belonging to a community than simply gauging the ability to address shared concerns. What appears to be missing is a sense of emotional and social investment in the community. The social cohesion dimension, therefore, may represent a sense of belonging and feelings of shared fate and destiny for community members that exists beyond a

common concern for addressing community problems. While there must be a minimum level of shared goals and values within a community to effectively promote the common good, this does not necessarily require a substantial emotional investment in the community to achieve, merely a sense of shared social responsibility. Neighborhood social cohesiveness, therefore, should reflect the emotional and social investment in the community beyond this minimum. In essence we argue that this social cohesion component reflects a sense of personal investment in a neighborhood along with a sense of belonging and shared destiny. This reflects a separate dimension of social functioning from collective efficacy.

While limited, the results of the models examining the predictors of perceptions of collective efficacy and perceptions of social cohesion are important. Knowledge about community meetings is important for perceptions of collective efficacy, as these offer demonstrable evidence that the community can come together for the common good. However, knowing about these meetings does not do anything to increase an emotional or social investment within the community. Unfortunately, problems with the wording of the question prohibit examining whether actually attending these meetings is associated with higher perceptions of collective efficacy, higher perceptions of social cohesion, or both. Participation in volunteer activities within the community appears to be associated with higher perceptions of social cohesion, but not collective efficacy. These volunteer activities increase the emotional and social investment within the community by fostering emotional attachments between residents. Further, home ownership was a significant predictor of perceptions of social cohesion, but not perceptions of collective efficacy. Owning a home (as opposed to renting or other temporary living arrangements) represents a considerable emotional and social investment in a community and should therefore be reflected when gauging the social cohesion among residents.

Again, the previous discussion should only be considered a preliminary attempt at distinguishing between collective efficacy and social cohesion, and do not necessarily reflect a final attempt at refining these concepts. There is much that remains unclear about the differences between these two constructs. For example, increased frequency of use of neighborhood grocery stores is associated with higher perceptions of collective efficacy, but not higher perceptions of social cohesion. Increased frequency of use of medical facilities within a neighborhood is associated with higher perceptions of social cohesion, but not higher perceptions of collective efficacy. Increased frequency of use of neighborhood parks is associated with both higher perceptions of collective efficacy and higher perceptions of social cohesion. While the differences between these effects are likely a result of the nature of the activities and social interactions at these types of locations, it is still unclear why this pattern exists. For this reason, further theoretical and empirical examination of these constructs is needed.

3. Examine the role of neighborhood context as a moderator of the relationship between perceptions of collective efficacy, social control, and key outcomes.

The results presented here demonstrate that the relationship between perceptions of collective efficacy, perceptions of social cohesion, and other individual-level outcomes shows considerable variability across neighborhoods. This is not surprising as the current research confirms a similar finding from Swatt et al. (2013) that used a smaller sample of these neighborhoods with a much more limited measure of perceptions of collective efficacy. To a large extent, the current research design prohibits anything beyond an exploratory investigation

Table 23. Matrix of Targeted Neighborhoods

Neighborhood	Race/Ethnicity Composition	Socio-Economic Status	Crime Level
Brownsville	African American	Low	High
Bunche Park	African American	Low/Middle	High
East Little Havana	Hispanic	Low	High
Seminole Wayside Park	Mixed/White/African American/Other	Low	Moderate
Kendall Hammocks Park	Mix/Hispanic/White	Middle	Low/Moderate
Ives Dairy Estates	Mix/White/African American/ Hispanic	Middle	Low
Auberdale	White Hispanic	Middle/Low	Low
Coral Reef Park	White	Upper Middle	Low

Table 24. Matrix of Targeted Neighborhoods and Findings

Neighborhood	Collective Efficacy & Incivilities	Collective Efficacy & Satisfaction w/police	Collective Efficacy & Fear of Crime	Social Cohesion & Incivilities	Social Cohesion & Satisfaction w/police	Social Cohesion & Fear of Crime
Full Sample	Statistically Significant	Statistically Significant		Statistically Significant	Statistically Significant	Statistically Significant
Brownsville	Statistically Significant					Statistically Significant
Bunche Park						
East Little Havana				Statistically Significant	Statistically Significant	Statistically Significant
Seminole Wayside Park			Statistically Significant (positive)	Statistically Significant		Statistically Significant
Kendall Hammocks Park			Statistically Significant (negative)			
Ives Dairy Estates	Statistically Significant	Statistically Significant	Statistically Significant (negative)	Statistically Significant	Statistically Significant	
Auberdale				Statistically Significant	Statistically Significant	
Coral Reef Park		Statistically Significant	Statistically Significant (negative)		Statistically Significant	
Invariance Test			Statistically Significant	Statistically Significant		Statistically Significant

for the reason for such variability. There are, however, some tantalizing clues for why such variation was seen. We have included a matrix of certain neighborhood characteristics in Table 23 and a matrix of the findings from the analysis in Table 24 to facilitate this discussion.

The results of the invariance test suggest that there is statistically significant heterogeneity in the coefficients for perceptions of social cohesion on perceptions of incivilities between neighborhoods. While the coefficients only approached statistical significance for Brownsville and Bunche Park, the magnitude of these coefficients is much closer to the remaining coefficients for the other neighborhoods and non-significant results may be due to the sample size in these neighborhoods. However, the relationship between perceptions of social cohesion on perceptions of incivilities was substantively small and non-significant for Coral Reef Park and Kendall Hammocks Park. Not coincidentally, these neighborhoods also have the highest median income and highest proportion of residents with at least some college education according to the ESRI neighborhood profiles. It may be the case that social cohesion is much less important for understanding perceptions of incivilities in affluent neighborhoods. One reason that this may be the case is that it is possible that social behaviors that may be considered incivilities in less advantaged neighborhoods are not seen as such in more affluent neighborhoods. For example, groups of youths who are "hanging out" with little adult supervision may carry the presumption of engaging in objectionable behavior by residents in disadvantaged neighborhoods, whereas similar groups may carry the presumption of engaging in non-threatening adolescent socialization in affluent neighborhoods. Social cohesion becomes important in less affluent neighborhoods because involvement and investment in the neighborhood likely results in more familiarity with neighborhood residents, i.e., a greater likelihood of identifying the particular adolescents who are socializing and the activities in which they are engaged. Therefore, in less

affluent neighborhoods, greater perceptions of social cohesion are linked with an increased tolerance for unsupervised adolescent activity and a lower tendency to ascribe nefarious purposes to such social behavior.

Another interesting finding regarding the heterogeneity of coefficients between neighborhoods concerns the relationships between perceptions of collective efficacy and fear of crime. As previously mentioned the relationship between perceptions of collective efficacy and fear of crime was only negative and statistically significant for Coral Reef Park, Ives Dairy Estates, and Kendall Hammocks Park. This relationship was not statistically significant for Brownsville, Bunche Park, East Little Havana, and Auberdale. These four neighborhoods are the most racially and ethnically homogenous in the sample (Brownsville and Bunche Park with over 94% African-American residents; East Little Havana and Auberdale with over 94% Hispanic/Latino residents). It is possible that the link between perceptions of collective efficacy and fear of crime is less salient in neighborhoods where there is a high degree of homogeneity between residents. Further, the relationship between perceptions of social cohesion and fear of crime was statistically significant for Brownsville, Seminole Wayside Park, and East Little Havana. With the exception of Seminole Wayside Park where the coefficient for perceptions of collective efficacy is positive and the coefficient for perceptions of social cohesion is negative, there is no overlap between neighborhoods where both perceptions of collective efficacy and social cohesion both have a statistically significant effect on fear of crime. It would appear, at least on the surface, that perceptions of collective efficacy are important for understanding fear of crime in neighborhoods with less demographic homogeneity, whereas in more homogenous neighborhoods, perceptions of social cohesion is a more important predictor of fear of crime.

While these patterns are certainly intriguing, the limitations of the research design prohibits a formal examination for potential moderating influences of neighborhood social context on the relationships between perceptions of collective efficacy and social cohesion with other perceptual outcomes. Unfortunately, additional research with a larger cross-section of neighborhoods is necessary to investigate the potential of cross-level interactions between neighborhood-level influences on the relationships between individual perceptions of neighborhood functioning and other important level-1 outcomes.

4. Investigate the role of predictor variables, especially patterns of activity and use of neighborhood resources, in fostering higher perceptions of collective efficacy and social cohesion.

The analyses examining the potential sources of perceptions of collective efficacy and social cohesion hold particular promise for policy relevant discussion and the development of interventions designed to improve neighborhood social functioning. The findings from this investigation suggest that collective efficacy and social cohesion remain important and separate dimensions of neighborhood functioning. Perceptions of collective efficacy and social cohesion show differential relationships with important individual-level outcomes and individual-level predictors. Further, the kriged maps demonstrate that while collective efficacy and social cohesion are linked, it remains possible that sections of neighborhoods are bereft of either collective efficacy or social cohesion, but not both. The consequences of these findings suggest that it remains possible that interventions designed to improve neighborhood functioning may differentially impact these dimensions of social functioning. As a worst case scenario, it may be the case that a neighborhood (or section of a neighborhood) lacks social cohesion but the

intervention selected only increases collective efficacy. In order to avoid such situations, it is important to better understand the sources of collective efficacy and social cohesion.

As part of the preliminary analyses, we argued that certain types of activities or the use of particular neighborhood resources differentially impact perceptions of collective efficacy and social cohesion. The results appear to support this hypothesis, as the coefficients for particular variables differed between models for perceptions of collective efficacy and social cohesion. Unfortunately, the explanatory power of both models was very low, likely owing to the limited number of available variables. Future research should consider a greater number of potential activities and resources beyond what was available in the current surveys.

Regardless, the current investigation represents an important first step at articulating the different sources of perceptions of collective efficacy and social cohesion. It further remains to be seen whether these findings "scale up" to the aggregate-level as well. Specifically, whether the extent to which residents within the neighborhood engage in these activities or use neighborhood resources translates into differential levels of collective efficacy or social cohesion. Extending this research will be critical for understanding the differences between collective efficacy and social cohesion and designing policy strategies to support the development and improvement of neighborhood social functioning.

5. Refine the methods used to explore the local density of collective efficacy and social cohesion

One of the critical advances in the current research is the use of kriging to estimate the local variation in collective efficacy and social cohesion. The theoretical idea behind the use of kriging is that while individual respondents within a neighborhood comprise individual "raters"

of the social functioning of the neighborhood, the reliability of these ratings diminishes as function of the distance away from the awareness space of the individual raters. As such, each individual rater contributes not only an assessment of neighborhood functioning, but a spatial reference for the locus of the accuracy of this rating, which is approximated here as the spatial location of their residence. Using tools in geostatistics, the ratings, locations, and patterns of similarity within these ratings can be used to estimate the semivariogram; which in turn, is used to interpolate estimates of the spatial variationin neighborhood functioning. Combining IRT estimates of the latent variables for perceptions of collective efficacy and social cohesion and incorporating these estimates into a method for interpolating the local density of neighborhood functioning represents an important advance in ecometrics and provides considerable opportunities for future research to investigate within-neighborhood social functioning.

There is important refinement that remains with the methods discussed in this report. First, although the simple random sampling strategy employed here will provide useful estimates of the local density, it is likely that this strategy is not the most efficient for estimating the local density of neighborhood social functioning. One important future improvement would be to improve the sampling strategy. While random sampling provides unbiased estimates for the kriged density, this may not be the most efficient sampling strategy. Future research may wish to consider alternative sampling strategies, such as spatially stratified sampling or two-step spatial adaptive sampling to reduce the kriging standard error (see Delmelle, 2009 for a discussion).

Second, we have conceived the process as a two-step strategy for estimating the spatial surface. Scores on the latent variables are first obtained using IRT models and then these scores are used to produce kriged estimates for the spatial surface. This strategy imposes an important restrictive assumption, that measurement error remains non-spatial in nature. Unfortunately, the

degree to which this assumption is valid cannot be assessed using this two-stage strategy. A recommended extension of the method would be to explicitly incorporate the measurement model directly into the method for interpolating the spatial surface. We are currently unaware of any efforts to integrate the Item Response Model into the geostatistical model for kriging, which is not surprising given the different origins of these two methods. However, it is likely that integrating these models would be beneficial by first increasing the efficiency of the estimation process and by allowing for methods to test assumptions regarding the spatial independence of measurement error.

Finally, it may be useful to consider changes in the estimated spatial surfaces over time. Ultimately, when discussing concepts like collective efficacy and social cohesion there is a specific emphasis on social *process*. Unfortunately as Sampson (2012) notes, despite the emphasis on process, very rarely have ecological studies of crime incorporated assessments of the community at more than one time period. One of the constraining factors for these types of studies is the cost associated with residential surveys carried out across a large number of neighborhoods across an urban area. However, if the focus of the research is on within neighborhood change, the cost of the study is substantially reduced as it is possible to focus on a smaller number of neighborhoods that are observed over time. Even an intensive study of a single neighborhood over multiple time periods may provide substantial insight into within-neighborhood changes in social functioning over time. Given the reduced cost of such studies coupled with the potential for understanding dynamic change in neighborhood functioning over time, there would be a clear benefit in longitudinal studies with fewer (or even one) neighborhoods.

CHAPTER IX. CONCLUSIONS AND DISCUSSION FOR FUTURE POLICY

There is little doubt that the concept of collective efficacy has captured the imagination of the scholarly community over the past decade. The theory of collective efficacy offers the potential to explain *why* neighborhoods differ in terms of crime rates and levels of disorder, and also explain the *impact* of crime and disorder on neighborhood-level social dynamics. Research on collective efficacy has led to a better understanding of the intricate relationships among and between population turnover, crime and disorder, and features of social relationships regarding the willingness to intervene and the sense of working trust among neighbors. Recent developments in the literature have been important in showing that not only are neighborhoods worthwhile places for public interventions, but that the interventions should move beyond crime and disorder and look more closely at the nature of relationships within that neighborhood. The complex set of findings can be distilled down to several of the most notable for policy.

1. **Similarities and differences in collective efficacy and social cohesion. Collective efficacy and social cohesion are separate but related concepts:** Our research suggests that collective efficacy (willingness to intervene) and social cohesion (sense of working trust in the neighborhood) are related but distinct processes. We found that the impact of perceptions of collective efficacy and social cohesion on key outcome measures is somewhat different. Our findings confirm that both perceptions of collective efficacy and social cohesion were important in predicting perceptions of incivilities, but the impact of social cohesion was more pronounced. That is, if a person has a high level of working trust in her neighborhood (social cohesion), then she has a low tolerance for graffiti, litter, vacant buildings and other disorders (incivilities). That same person also believes

that her neighbors are willing to intervene in problems and she has a low tolerance for incivilities.

Perception of social cohesion was a significant predictor of fear of crime, but perceptions of collective efficacy was not. That is, if a person has a low level of working trust in her neighborhood, then she has a higher level of fear of crime. Her belief that others are willing to intervene or not (collective efficacy) has no impact on her perception of fear of crime. Similarly, if a person has a high level of trust in her neighborhood, then she has a lower level of fear of crime. Once again, perception of collective efficacy has no effect on perceptions of fear of crime.

2. **Neighborhood Dependence. The relationships between perceptions of collective efficacy and social cohesion and key outcomes are neighborhood dependent.** We found support that the relationships identified above are *place-dependent*. Perceptions of collective efficacy, for example, was independently (of social cohesion) predictive of perceptions of incivilities in two study neighborhoods and not the others. That is, in Brownsville and Ives Dairy Estates residents with high perceptions of collective efficacy had a low tolerance for incivilities. Similarly, perceptions of social cohesion was independently (of collective efficacy) predictive of perceptions of incivilities in four study neighborhoods and not the others. In East Little Havana, Seminole Wayside Park, Ives Dairy Estates, and Auberdale residents with a high working trust of their neighbors had a low tolerance for litter, graffiti, vacant lots, and other disorders.
3. **Social Activities. Different social activities in neighborhoods are associated with perceptions of collective efficacy and social cohesion in different ways.** Different types of social activities appear to be more effective in producing collective efficacy

versus social cohesion and vice versa. *Knowledge of community meetings* and *use of neighborhood grocery stores* were significantly associated with perceptions of collective efficacy but not perceptions of social cohesion. *Participation in volunteer activities*, the *use of neighborhood medical facilities*, and *home ownership* were significantly associated with perceptions of social cohesion. Only *use of neighborhood parks* was significantly associated with both perceptions of collective efficacy and social cohesion.

4. **Relationships within Neighborhoods. The relationships between neighborhood factors and both collective efficacy and social cohesion vary <u>within</u> neighborhoods:** Using advanced GIS mapping techniques we found that within distinct neighborhoods, these relationships are often more localized. That is, we found that there are discernible *micro-environments* within larger neighborhoods that should be understood as distinct areas worthy of focused policy interventions. While the idea of *micro-environments* is similar in theory to "hotspots" (Sherman et al., 1989) which have been widely discussed in criminological literature for some time, we conclude that the geographical concentration of social functioning is likely even more localized than traditionally envisioned.

POLICY IMPLICATIONS: OVERVIEW

Collective efficacy theory offers the potential for tangible policy implications. Prior to reviewing the policy implications of our research, we begin with an overview of a set of the most comprehensive policy implications to date for collective efficacy. Sampson (2011) argues that the most significant implication of collective efficacy theory is that it focuses on *places* and not *people.* The idea that social problems are disproportionately concentrated in highly localized

places is not a new finding. Contemporary research suggests, for example, that focused attention to areas of highly localized problems can significantly reduce violence and property crime (Braga & Bond, 2008; Taylor, Koper, & Woods, 2011). Braga and Bond (2008) suggest these efforts can be done without necessarily displacing problems to other areas. Hot-spot policing offers the potential for short term and long term public safety efforts.

In addition to "hot spot" crime reduction efforts, Sampson (2011) encourages policymakers to expand the scope of their policy concerns beyond crime and serious disorder. The literature on incivilities, for example, suggests that more minor forms of social and physical disorder have serious deleterious effects on neighborhood conditions. From a *broken windows* (see Wilson & Kelling, 1993) approach, disorder that is left unaddressed will o encourage additional disorder and further neighborhood deterioration. Incivilities also promote fear of crime and disinvestment by businesses. Communities are encouraged to implement strategies specifically geared toward redressing these problems such as community beautification strategies, public mobilization campaigns, and the use of zoning and licensing to restrict certain behaviors. While many of these neighborhood strategies are not new, they can be more explicitly viewed as part of broader public safety and community enhancement strategies. Importantly, this research makes it clear that crime reduction is achieved through strategies other than just enforcement. These problem-oriented strategies offer the real advantage of not only having true public safety value, but doing so in a way that builds positive and sustainable relationships with communities.

Beyond the more traditional crime and disorder approaches, law enforcement and other policy makers are encouraged to recognize the true public safety value of explicit strategies intent on building informal social control and collective efficacy. Far too often efforts directed at

engaging and mobilizing communities are seen as ancillary to public safety strategies. Traditional tactics such as national night out and similar strategies, while popular in some communities, are rarely recognized by law enforcement and policymakers as central to public safety efforts. The collective efficacy literature makes it clear that communities characterized by high levels of informal social control are better positioned to buffer the effects of negative socio-economic conditions. Efforts directed at building the quantity and quality of informal local networks and neighborhood-level infrastructure that promote good behavior have *real* potential. In some cases, collective efficacy and informal social control can be promoted through deliberative "branding" strategies that create the physical appearance of shared social space. Periodic neighborhood newsletters, public signage strategies that demarcate neighborhood boundaries, and similar approaches have been shown to be effective at promoting a sense of common interests and shared space (Wickes, 2010). These are strategies that lend themselves toward discrete policy strategies.

Finally, Sampson (2011) suggests a series of neighborhood efforts that promote neighborhood stabilization should be prioritized. It is well known that economically depressed neighborhoods with high population turnover are often among the most violent (Bursik, 1988; Sampson & Groves, 1989). It is no secret that the more recent economic downturn has resulted in increases in crime and disorder in certain neighborhoods. Although the causal processes that promote crime are complex, there is some evidence that the large increase in foreclosures disproportionately felt in certain neighborhoods has had a noticeable effect on crime and disorder (Bess, 2008). It is critical to recognize that policy strategies that reduce the concentration of poverty and promote the stabilization of housing offer tangible public safety benefits (Sampson, 2011).

On a national scale, one example of improving specific, targeted neighborhoods through stabilization, financial re-investment and crime reduction, is the Neighborhood Revitalization Initiative (NRI). This is a White House-led collaboration between the U.S. Departments of Education (ED), Health and Human Services (HHS), Housing and Urban Development (HUD), Justice (DOJ), and Treasury. The idea is to revitalize specific, neighborhood environments through community-based initiatives that produce significant benefits for distressed neighborhoods as well as surrounding areas. These federal agencies are providing "place-based grants to offer grantees an integrated system of support by breaking down 'silos' so that solutions are implemented more effectively and efficiently and communities can access services in a more comprehensive and coordinated way" (BJA, 2013). Moreover, these federal agencies are working together to make it easier for a single community to leverage federal resources and reduce barriers to effective and coordinated implementation of federal grants.

Specific grant programs such as Promise Neighborhoods (ED), Choice Neighborhoods (HUD), Community Health Center grants (HHS), Community Development Financial Institutions (CDFI), and the Byrne Criminal Justice Innovations (DOJ BJA) are directing funds to locations that are in need of neighborhood stabilization and public safety. The programs emphasize targeted, place-based strategies using theories of hot spots and environmental crime (BJA, 2013). Unfortunately, they do not specifically target areas of low collective efficacy or social cohesion, but by implication are focused on high poverty, high crime, and high levels of social disorganization. It remains to be seen whether and how our study of collective efficacy and those before us (Sampson and others) might influence policy makers as they seek solutions to these problem neighborhoods.

POLICY RECOMMENDATIONS

How does our research on collective efficacy, social cohesion, incivilities, satisfaction with police, and fear of crime in Miami-Dade County translate into specific and tangible recommendations for refining public policy strategies? In this section, we provide specific recommendations that have both national and local implications for policy makers, community organizations and organizers, law enforcement, and researchers.

Recommendations

1. Educate policymakers, community organizations and organizers, and law enforcement about collective efficacy and social cohesion and their links to incivilities, fear of crime, and satisfaction with police.

Collective efficacy and social cohesion are difficult concepts to grasp immediately. Because these terms and phrases are based on the language of social scientists, sociologists, criminologists, and statisticians they are cumbersome and do not translate to action readily. Nonetheless, the findings from our study and those of Sampson and others before us have important ramifications for communities and neighborhoods across the country and in Miami-Dade County, Florida. It behooves us to make these concepts understandable and useful. We will work with The Children's Trust of Miami-Dade County (The Trust), the National Institute of Justice (NIJ), and the Bureau of Justice Assistance (BJA) to make our findings more understandable for a larger audience.

At the same time, however, The Trust, NIJ, and BJA should recognize the importance of the concepts of collective efficacy and social cohesion and transmit the findings as broadly as possible to state, local, and Federal agencies. Further, in order for these efforts to be beneficial, training should be provided to ensure that local and Federal spokespersons explaining these

concepts understand them and can translate them in a uniform manner with consistent definitions and examples to local level policy makers and community leaders.

1a. Continue to fund research on collective efficacy and social cohesion

The Children's Trust and NIJ should continue to invest in studies of this nature, particularly to replicate and enhance the current findings. In the 1990s NIJ made a large investment in the Program on Human Development in Chicago Neighborhoods (PHDCN), yet the current study is the first that has added questions and dimensions to the collective efficacy scale in a different environment/geographic location. The Children's Trust funded this project to learn more about the neighborhoods in Miami-Dade County, particularly as they relate to assisting children and families and violent crime. While researchers always indicate that "more research is needed," in this instance we believe that adding to the body of knowledge created here and before us is a worthwhile and cost effective endeavor for community-based organizations and those with a stake in public safety. If the concepts presented here can be better understood, efforts and investments can be more precisely targeted and tailored to achieve improved quality of life for residents.

2. Develop and Implement Collective Efficacy Strategies for Community-Based Efforts

Research on collective efficacy and the role it plays in protecting vulnerable communities against crime continues to accumulate and suggests that collective efficacy has stronger effects on crime than many traditional social structure variables (Sampson, 2012). Given the importance of the theory and its potential for preventing crime, we recommend that community-based organizations and their funders insert a Collect Efficacy Strategy into their plans for neighborhood improvements, revitalization, crime prevention programs, or other efforts that seek to improve the overall condition of a neighborhood.

Essential components of a Collective Efficacy Strategy include goals, objectives, measures, and a research partner to assist with data collection and analysis and to conduct an evaluation.

Goals would include: 1) Increase the willingness of individuals within communities and neighborhoods to do something about problems in their areas (collective efficacy); 2) Increase the sense of working trust in neighborhoods and communities (social cohesion); 3) Reduce incivilities (litter, noise, etc.) in specific neighborhoods; 4) Increase satisfaction with police services; and 5) Reduce fear of crime. For each goal, specific objectives and measures should be articulated and devised. For example, to increase collective efficacy and social cohesion communities could encourage individuals or groups to use public parks, as we have found that doing so is associated with higher perceptions of both concepts. (It may be necessary for police and city services to assist in making the park drug- or crime-free and accessible, but this would also be an objective within goal 4). Another objective for increasing social cohesion is to encourage more volunteerism. This may mean calling for assistance in cleaning up a park or re-painting a community center on the weekend, assisting children after school, and any number of activities that invest people in the community. Volunteerism should be directed and targeted to achieve the goals identified.

Measures for each goal and objective should be created, developed, and implemented. Measures would be based on questions in our survey instrument but should be broadened to include specific items that community organizers believe are relevant to their strategy. For example, volunteerism could be measured by the number of people who volunteer, the types of activities they volunteer for, the types of opportunities that are available, and the time committed

to the voluntary activity. This goes well beyond our measure of "have you done volunteer work in the last year to benefit your community (yes/no)".

The creation and implementation of these measures do a number of things. First, they broaden the understanding of collective efficacy to the community organizer and those who participate in the project. Second, they provide new and more relevant measures to the theory of collective efficacy. Third, they assist in learning about the overall success of the project as the measures will be used in the evaluation.

It is important, however, to recognize that implementing a strategy to measure and track neighborhood-level concepts such as collective efficacy, social cohesion, fear of crime, and satisfaction with the police over time is not a small endeavor. Local communities, particularly public-sector agencies such as law enforcement, generally do not have the local expertise and capacity to implement and sustain data collection strategies. It is imperative for grant funders to include local research partners in Collective Efficacy strategies. Much like the programs run by the Bureau of Justice Assistance (e.g., BJA's Smart Policing, Smart Probation, Byrne Criminal Justice Innovative Program, and others), we recommend the inclusion of a researcher or research organization to evaluate the project and to assist in analyzing data pertinent to the community that is being served. In addition to the evaluation role, a research partner can provide critical baseline information to guide efforts followed by timely feedback.

Recently BJA has stressed the inclusion of researchers as part of its emphasis on using evidence-based approaches to crime reduction. The research partner has been tasked with using data to identify specific crime-prone areas (hot spots) or chronic offenders, conducting statistical analyses of the data, and assisting with strategic solutions to crime problems. In addition, the researcher serves as the evaluator of the project, developing measures, collecting data, and

determining whether and how the project was implemented, and the impact of the project on crime and other outcomes. This arrangement is collegial and collaborative and results in data-driven decisions during the course of the project, interim reports that provide feedback to the lead organization, and a final report that explains what happened and why.

3. Use Micro-Environments within Communities

While there is a long history of community-based strategies for reducing crime and violence, these interventions have out of necessity, focused on interventions at a very high level of aggregation, such as neighborhood-wide interventions. Conventional methodological approaches in collective efficacy research have only been capable of identifying which neighborhoods have low collective efficacy and are in need of intervention. This is limiting as neighborhoods are large social aggregates (and neighborhood clusters doubly so) and often considerable resources are necessary for non-policing community-based crime reduction strategies.

Our finding that there is considerable heterogeneity in collective efficacy and social cohesion *within* neighborhoods is of considerable importance because it suggests that interventions may not need to be directed at the neighborhood as-a-whole but rather focused to those areas within a neighborhood where the exercise of social control has been diminished. The improvements that have been made in the scale for measuring collective efficacy and social cohesion coupled with the recommendation of kriging methods for assessing the local variability of these social processes provide a strategy for assessing the degree of community functioning at smaller levels of analysis. This enables much more targeted strategies for enhancing community functioning as well as a better method for incorporating problem-solving methods for identifying and addressing potential causes of the diminished capacity of residents to exercise social control.

Two main strategies emerge from this enhanced ability to identify collective efficacy and social cohesion at lower levels: filling-in and building-up. *Filling-in* refers to the process of identifying areas with substantially lower levels of collective efficacy and social cohesion and focusing efforts on community building within those locations. The purpose of this strategy is to identify potential "sinkholes" of collective efficacy and social cohesion and problem-solving the causes of such sinkholes. Strategies targeted toward micro-environments allow for a better use of already limited resources. *Targeting micro-environments* provides a robust methodological framework for leveraging *dosage* of interventions that may be place-specific. That is, researchers can measure the appropriate levels of interventions needed to improve collective efficacy and social cohesion. A more comprehensive understanding of criminogenic correlates of disorder, and how they are co-allocated in micro-environments provide cues for intervention. These causes could be features of space, such as mixed land use or particular "crime attractors" that may lead to an inability of nearby residents to exercise social control, either by fostering a sense of isolation and detachment to the community or by producing a sense of hopelessness and an inability of social action by residents. The presence of certain businesses, for example, such as check-cashing establishments, pawn shops, and even certain alcohol establishments have negative impacts on neighborhoods (Cancino, Varano, Schafer, & Enriquez, 2007). These establishments often attract an unsavory crowd, and feed off of the most disadvantaged in a way that generally exacerbates the effects of poverty. These causes, however, could also be a product of the nature of residential factors in the area, such as a high population turnover or systematic impoverishment. Importantly, researchers are encouraged to provide more complete explanations of the causal processes that influence the social and cultural characteristics of micro-places.

An example of filling-in can be seen in potential interventions in the Brownsville neighborhood. A sink in collective efficacy (i.e., a location where collective efficacy is lower than surrounding areas) can be observed near the center of this neighborhood, which corresponds to a concentrated location of Section 8 housing. A community-based intervention in the entire Brownsville neighborhood will likely be ineffective as collective efficacy is actually much higher in the surrounding residential areas. Community-wide interventions will likely result in bringing in individuals who are already invested in the community and have higher perceptions of collective efficacy rather than residents in the affected areas. Moreover, heavy suppression efforts that "bleed" into largely efficacious sections of neighborhoods could alienate viable community partners and increase fear of crime (see Hinkle & Weisburd, 2008). Instead, we need efforts that are focused on community building specifically within this low-income housing area. An intervention that specifically targets this section of the neighborhood is likely to be more successful and more cost-effective at reducing crime. *Filling-in* geographical areas where collective efficacy is extraordinarily low likely has implications both for the *quality* (type) and *quantity* of intervention strategies.

Building-up on the other hand involves identifying areas within a distressed community with high collective efficacy and finding ways to leverage these residents to foster better community functioning in nearby areas. Through a continual process of bringing in residents of nearby areas and building outwards, it is possible to eventually improve the functioning of the neighborhood as a whole. For example in Bunche Park there is a rise in collective efficacy (i.e., an area where collective efficacy is higher than surrounding areas) corresponding to single family households adjacent to a school. Near this area to the south is a sink in collective efficacy. An appropriate strategy for improving neighborhood functioning in this area would be to

leverage the residents living in the high collective efficacy section of the neighborhood and focus on community building efforts that bring in residents from the periphery of this area. This process then proceeds sequentially as residents from peripheral areas are brought into the intervention in a series of phases. In this way, it is possible to improve the level of community functioning for the neighborhood as a whole.

These two processes should not be seen as mutually exclusive, but rather complementary strategies for improving community functioning in problematic neighborhoods. The key development, however, is providing the capability of designing interventions based on the improvement in measurement and spatial precision offered by the methodological approaches adopted in the current research. Coupling this methodological advancement with highly targeted strategic interventions designed to improve community functioning may offer highly effective crime prevention strategies at lower cost.

4. Improve Law Enforcement's Understanding of Collective Efficacy

There is no doubt that police play an important role in keeping neighborhoods safe. In earlier studies we have found that police involvement has a direct impact on fear of crime, satisfaction with police services, and incivilities (Uchida & Forst, 1994). Evidence from field experiments in Houston, Texas (Pate, Wycoff, Skogan & Sherman, 1986), Newark, ew Jersey (Kelling, Pate, Ferrara, Utne, & Brown, 1981), Flint, Michigan (Trojanicz, 1982), and Baltimore, Maryland (Pate & Annan, 1989) have served to validate the theory that closer ties between the police and the community, especially in the form of door-to-door contacts and foot patrols, raise levels of citizen satisfaction with police services and quality of life and lower their levels of fear of crime. In fact, the philosophy of community-oriented policing rests on the assumption that

community engagement improves relationships between the police and the public and reduces fear of crime.

Our findings in the current study show that the police are not the only factor that have an impact on incivilities, satisfaction with police services, and fear of crime. Indeed, we now know that collective efficacy and social cohesion have similar impacts on these outcome variables depending upon the neighborhood and micro-environments.

What does this mean for police? How do they play a role in the general scheme of collective efficacy?

For police, community engagement is one of three 'pillars' of community policing, the other two being problem-solving and organizational change. Community engagement has come to mean attending and participating in community meetings, working with community advisory boards to address broad issues, providing neighborhoods with on-line crime maps and data, and on occasion solving problems using Herman Goldstein's problem-oriented policing model (Goldstein, 1991). These methods are all well and good, but only touch the surface of what could be done to make communities safer over the long term.

Understanding collective efficacy and social cohesion would give more depth to the police role within the community. Police know that their presence and visibility have an impact on controlling behavior (formal social control). In their absence, however, people are often left to their own devices, and depending on their micro-environment, are willing to intervene or not when they are confronted with problems (informal social control). To make things easier for the individual the police should take cues from what contributes to higher perceptions of collective efficacy in certain places -- greater use of neighborhood parks, greater use of neighborhood grocery stores, and knowledge of community meetings. For example, police may see a park as a

recreational location where kids come to play, where babysitters bring their wards, where drug traffickers deal dope, where gang members hang out, or where the homeless seek shelter. If, however, they see the park as a *place* where neighbors meet to network, form social bonds, and become invested in the neighborhood, then the purpose is different and perhaps police attitudes and strategies will change. Removing the drug traffickers, gang members and the homeless through sweeps and other enforcement activities have a higher purpose than simply moving nuisances. By understanding that the park is not just a grassy location but also a place where friendships and bonds of trust are formed within a neighborhood, then perhaps the police will commit to longer term strategies to make that place safe and keep it safe.

Understanding these concepts and linkages between and among collective efficacy, social cohesion, incivilities, satisfaction with police, and fear of crime puts the police on a different plane -- it makes them realize the importance of the human element within neighborhoods and communities.

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Appendix A

Instrument for Resident Surveys