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**Problems, Perceptions and Actions:
An Interdependent Process for Generating Informal Social Control**

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Biography

John R. Hipp is a Professor in the departments of Criminology, Law and Society, and Sociology, at the University of California Irvine. His research interests focus on how neighborhoods change over time, how that change both affects and is affected by neighborhood crime, and the role networks and institutions play in that change. He approaches these questions using quantitative methods as well as social network analysis. He has published substantive work in such journals as *American Sociological Review*, *Criminology*, *American Journal of Public Health*, *Social Forces*, *Social Problems*, *Social Networks*, *Journal of Research in Crime and Delinquency*, *Journal of Quantitative Criminology*, *Mobilization*, *Health & Place*, *City & Community*, *Crime & Delinquency*, *Urban Studies* and *Journal of Urban Affairs*. He has published methodological work in such journals as *Sociological Methodology*, *Psychological Methods*, and *Structural Equation Modeling*.

Rebecca Wickes is an Associate Professor in the School of Social Sciences at Monash University in Melbourne, Australia. Her research focusses on demographic changes in urban communities and their influence on community regulation, crime and disorder. She has published substantive work in journals such as *Criminology*, *Journal of Quantitative Criminology*, *Journal of Research in Crime and Delinquency*, *Social Science Research*, *American Journal of Community Psychology*, *the Journal of Urban Affairs*, among others. She is the lead investigator of the Australian Community Capacity Study, a multisite, longitudinal study of place.

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Abstract

Using two waves of survey data for residents in neighborhoods in Brisbane, this study explores the interdependent relationship between residents' perceptions of neighboring, cohesion, collective efficacy, neighborhood disorder, and the actions they take to address these problems. Our longitudinal results show that residents' perceived severity of a problem helps explain engaging in activity to address the problem. People loitering appeared to be the most galvanizing problem for residents, but had particularly deleterious effects on perceptions of cohesion and collective efficacy. We also find that residents who perceive more neighboring in their local area engage in more public and parochial social control activity and residents who live in collectively efficacious neighborhoods are more likely to engage in parochial social control action. Furthermore, residents who themselves perceive more collective efficacy in the neighborhood engage in more parochial or public social control during the subsequent time period. Importantly, we find strong evidence that residents update their sense of collective efficacy. Perceiving more problems in the neighborhood, and perceiving that these problems are increasing, reduced perceptions of neighboring and collective efficacy over time.

Keywords: neighborhoods; collective efficacy; networks; disorder; action.

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INTRODUCTION

A body of scholarship has focused on the role that informal social control can play in reducing neighborhood crime and disorder. Much of this literature is informed by social disorganization theory, which posits that structural characteristics of neighborhoods impact social networks among residents. This breakdown of social networks then inhibits the exercise of informal social control actions that are targeted towards reducing/preventing crime and disorder (Sampson and Groves 1989). A related strand of studies focus on residents' perceived collective efficacy, or more specifically the capacity of the neighborhood to foster task specific informal social control actions aimed at reducing crime and disorder (Sampson, Raudenbush, and Earls 1997). Underlying these two theoretical perspectives is the assumption that at the end of the causal chain, informal social control *action* undertaken by residents in the neighborhood leads to the reduction of crime and disorder. These actions can involve calling the police or other government agencies (public informal social control) or working together with neighbors and neighborhood organizations (parochial informal social control) (Warner 2007; Wickes, Hipp, Sargeant and Mazerolle, 2016).

Limited research actually measures whether such action occurs and what factors influence the exercise of informal social control. In part this lacuna is because of the difficulty of measuring actual actions given the relatively few opportunities for such activity in some more advantaged neighborhoods. As a consequence, studies typically ask respondents how they would hypothetically respond to various scenarios, or even how they presume their neighbors would hypothetically respond to various scenarios (Hipp 2016). Such approaches leave untested the

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crucial step in the causal model of whether residents actually engage in such action, and if so, under what circumstances?

When considering what brings about residents' informal social control action, a related question is how action—or the lack of action—can feedback to residents' perceptions of the neighborhood's capacity to respond to problems. That is, whereas some research has tested whether neighborhood social networks and collective efficacy are associated with levels of crime and disorder under an assumption of a unidirectional causal relationship, scholars increasingly emphasize the possible feedback effects on these attitudes from neighborhood conditions (Hipp 2016; Sampson 2006). For example, Hipp (2016) emphasized that new information on what residents do (or fail to do) when faced with a neighborhood problem likely alters residents' later assessments of the neighborhood's collective efficacy. Therefore we should observe that informal social control activity will strengthen collective efficacy and enhance neighboring and cohesion at a later time point. Moreover, as Hipp (2016) argued, when residents are uncertain about their neighborhood's collective efficacy, informal social control actions should be particularly important for residents in updating their perceptions.

In this paper, we respond to the current limitations in our understanding of informal social control action. Using two waves of survey data from a large neighborhood study, we pursue three objectives. First we explore if and how perceptions of neighborhood cohesion, collective efficacy, neighboring and disorder influence residents' reported informal social control actions at a later time point. Next, we consider whether the *exercise* of informal social control actions feeds back onto these perceptions over time. Finally, by focusing on low disorder contexts where residents likely have less information on the community's capacity to respond to problems, we specifically test if informal social control actions lead to positive changes in

residents' perceptions of neighborhood cohesion, collective efficacy and neighboring two years later.

In what follows, we first discuss the literature exploring the relationship between neighborhood structural characteristics, neighborhood problems, and individual informal social control actions taken in response to specific neighborhood problems. We then describe our data of surveyed households nested in neighborhoods, our methods, and present our results.

LITERATURE REVIEW

Social disorganization and systemic theories posit that key neighborhood structural characteristics of racial/ethnic heterogeneity, residential instability, and concentrated disadvantage can inhibit the formation of neighborhood social ties and neighborly interactions (Bursik 1988; Sampson and Groves 1989). This has negative consequences for the level of informal social control capability as neighborhood social ties represent both a reason to act and a resource for action (Bursik and Grasmick 1993). There is some evidence of this in the literature. Wickes and colleagues (2017) find that both the number of individual ties and the general level of neighboring in the neighborhood are important for the exercise of informal social control. A study of 66 neighborhoods in two large cities found that residents with more social ties were more likely to engage in direct informal social control action (Warner 2007). More recent work with these same data found that racially homophilous networks most strongly increased the likelihood of informal social control (Warner, Swartz, and Hawk 2015).

Others argue that neighborhood social ties are too distal theoretically to explain crime levels (Sampson, Raudenbush, and Earls 1997). In the collective efficacy scholarship, shared expectations for informal social control convey a shared norm that residents in the neighborhood will do something when a problem arises, which in turn should trigger action in response to a given problem, even in neighborhoods where ties are diffuse or 'weak' (Sampson, 2012). Thus

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while neighborhood ties might be important for generating collective efficacy, it is argued that ultimately it is the shared perception that fellow residents are capable and indeed willing to respond to unwanted behavior that leads to the exercise of informal social control, and hence lower crime. An important presumption emerging from this scholarship, therefore, is that residents would actually engage in informal social control action when a problem arises if they live in a neighborhood where they perceive their fellow residents as willing to exercise informal social control.

Recent advances of collective efficacy theory parse out the effects of social cohesion (or the degree to which residents feel connected to one another and share the same values) from expectations for informal social control actions. Scholars argue that collective efficacy is a task specific process that may be facilitated by cohesion, however, cohesion represents a more general construct that may or may not be related to crime control (Hipp 2016; Wickes, Hipp, Sargeant, and Homel 2013). As further evidence that cohesion may be best measured as a distinct construct, one study (Hipp 2016) argued that evidence from the psychology literature suggests that cohesion may help solve the well-known bystander effect (in which persons are less likely to engage in behavior when other persons are around); this study found cohesion to have a relationship with subsequent neighborhood crime distinct from crime's relationship with collective efficacy. There is also empirical evidence that collective efficacy and cohesion/trust are distinct constructs using data from Chicago (Rhineberger-Dunn and Carlson 2009) and Brisbane, Australia (Wickes, Hipp, Sargeant, and Homel 2013). A study of about 75 neighborhoods found that cohesion/trust (they termed it bonding social capital) was positively related to collective efficacy, but distinct from it (Collins, Neal, and Neal 2014). A follow-up study with the same data found that this relationship was particularly strong in homogeneous neighborhoods (Collins, Neal, and Neal 2017).

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Drawing on these recent advances to the systemic model and collective efficacy theory, neighborhood social ties, cohesion and expectations for informal social control are the key posited components that bring about *action* on the part of individuals (Bursik and Grasmick 1993; Sampson and Groves 1989; Sampson, Raudenbush and Earls 1997); however, their empirical association with the exercise of informal social control is rarely tested in the literature and has even been called into question theoretically. Steenbeek and Hipp (2011) pointed out a possible collective action problem in that the perception that others will engage in action does not necessarily increase the likelihood of one's own action (see also Wickes, Hipp, Sargeant, and Mazerolle 2017). Following from the insights of the collective action literature (Oberschall 1973; Olson 1971), residents might even free ride on the willingness of others to engage in potentially costly activity. That is, if one believes that others in the neighborhood are likely to confront delinquents or others engaging in disorderly behavior, this might even *reduce* the likelihood of an individual personally engaging in the activity.

Despite the importance of assessing whether social ties, cohesion and collective efficacy leads to formal or informal social control action, there is surprisingly little empirical evidence, in part due to the difficulty of collecting data on such behavior. One neighborhood-level study assessed whether neighborhoods in Utrecht, Netherlands in which more residents reported shared feelings of responsibility for the neighborhood then had a higher proportion of residents active to improve the livability and safety of the neighborhood at the subsequent time point, and found no such relationship in a longitudinal design (Steenbeek and Hipp 2011). A similar finding was detected with the same data even when using the much smaller geographic units of postal codes, which are about half the size of U.S. block groups (Hipp and Steenbeek 2016). Interestingly, both of these studies found that higher levels of neighborhood cohesion did tend to lead to more neighborhood action. In Australia, a cross-sectional multi-level study of residents in 148

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neighborhoods in Brisbane found no evidence that higher levels of collective efficacy resulted in more action in response to neighborhood problems by residents (Wickes, Hipp, Sargeant, and Mazerolle 2017).

The Effect of Problems and Informal Social Control Action on Neighborhood Processes

Whereas a large body of research has considered how neighborhood perceptions of cohesion, collective efficacy and social ties might have positive consequences for neighborhoods, more recent work has focused on possible feedback effects. Some of this research is based on the disorder and decline model of Skogan (1990), who argued that neighborhood disorder can impact residents in various ways. In part, disorder, and especially an increase in disorder, can lead to a sense that the neighborhood is in a downward spiral, and therefore induce residential mobility out of the neighborhood as residents abandon it. Another possibility is that the ongoing presence of disorder may be seen as a cue that residents lack the cohesion and collective ability to engage in action in response to this disorder (Hipp 2016).

Although the possibility that neighborhood conditions might impact residents' perceptions of collective efficacy was discussed by Sampson (2006), studies have rarely considered the methodological implication that such feedback effects call into question the causal direction of the collective efficacy and crime/disorder relationship. Hipp (2016) extended this idea further and argued that collective efficacy in neighborhoods is subject to an updating process. That is, residents presumably change their assessment of neighborhood collective efficacy based on new evidence. As a consequence, residents in neighborhoods in which a problem is not met by action would likely revise downward their assessment of collective efficacy. Whereas Sampson (2006) discussed the possibility that residents can change their assessment of neighborhood collective efficacy, Hipp (2016) emphasized that this is arguably a

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quite empirically important part of the process. An implication of this is that there may be a strong feedback effect, and therefore studies assuming a one-directional causal effect of collective efficacy on crime/disorder are misspecified due to this endogeneity.

This notion of updating by residents regarding their perception of the level of collective efficacy in the neighborhood implies that the presence of problems in the neighborhood, and particularly the change in the number of problems, might impact their perception of neighborhood collective efficacy. That is, the presence of problems in the neighborhood would be viewed as a direct refutation of the notion that the neighborhood has a high level of collective efficacy regarding addressing such problems. Furthermore, an increase in the number of problems in a neighborhood could be seen as an indicator that the neighborhood is worsening, and provide further evidence that the neighborhood lacks the collective ability to address such problems. If updating is indeed an important process among residents regarding their perception of the level of collective efficacy, then we should observe that an increase in the number of problems has a particularly strong negative effect on residents' sense of collective efficacy. It is possible that this might also influence residents' sense of cohesion and interactions with other residents in the area. As Skogan (1990) suggested, in the face of increasing neighborhood problems, residents may be more likely to withdraw from neighborhood life.

Whereas the presence of neighborhood problems likely has a negative effect on residents' perceptions of collective efficacy, Hipp (2016) pointed out that a consequence of orderly neighborhoods that experience few problems is that residents will not have opportunities to engage in social control activity. Residents in these neighborhoods may be more uncertain about the level of collective efficacy when compared to those living in neighborhoods with more problems. This implies that in a neighborhood with high levels of uncertainty about the level of collective efficacy, the lack of social control action in response to a problem will result in a sharp

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decrease in reported collective efficacy at the next time point. Hipp (2016) created a measure of this uncertainty about collective efficacy based on respondents' answers to a survey, and found that neighborhoods with more uncertainty at one time point that experienced more social disorder reported lower levels of collective efficacy at the next time point. In the present study, we assess whether this operates at the individual-level such that increasing problems in a neighborhood that previously had few problems has a particularly strong negative effect on perceived collective efficacy at the next time point.

Hipp (2016) also highlighted that residents' successful actions in response to problems should result in updating regarding the level of collective efficacy. Thus, a problem in the neighborhood that is addressed with action would presumably feedback to increase residents' sense of collective efficacy. This would operate at the individual level, whereby residents who engage in action to address a problem update their sense of neighborhood collective efficacy to a higher level at a subsequent time point. These changes at the individual level would aggregate up to a neighborhood level measure. It is also likely to operate at the neighborhood level: residents who observe others address problems have a heightened sense of collective efficacy over time. This in turn may increase the residents' social interactions and sense of cohesion. If people believe that others will act in the best interest of the neighborhood, social cohesion should strengthen which in turn would promote greater levels of social interaction in the neighborhood.

Indeed, a cross-lagged longitudinal study of parents of adolescent children living in North Carolina neighborhoods (Hipp 2016) found that the effects of neighborhood-level perceived crime or disorder on collective efficacy at the next time point were at least as strong, if not stronger, than the effect of collective efficacy on perceived crime or disorder at the subsequent time point. Thus, higher levels of perceived disorder at one time point resulted in less cohesion at the next time point and (indirectly) lowered expectations of informal social control capability.

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This same study also found that higher levels of perceived crime resulted in lowered collective efficacy at the next time point. The fact that this same study found the typical negative relationship between collective efficacy and crime in a cross-sectional analysis that mimicked the design often employed in the literature highlights that this feedback effect may be particularly important to study.

It is possible that different types of problems will have differential effects on neighborhood process, though, again, few studies specifically consider this. For example, Hipp and Steenbeek (2016) considered whether different types of crime had varying impacts on neighborhood processes. They classified crimes based on three dimensions: 1) whether they occur in public or private; 2) whether the crimes are violent or non-violent; 3) whether they occur relatively frequently. Here we focus not on crime but on physical and social disorder, and therefore the public/private dimension is not applicable. However, social disorder, in which persons are engaging in undesirable activity, may have a stronger impact on residents given that such activity can represent a greater possibility of experiencing violence. That is, encountering people hanging out on the street may represent more of a direct threat of violence compared to observing the presence of graffiti or vandalism. Indeed, Hipp and Steenbeek (2016) found that more perceived violent crime in the neighborhood reduced cohesion and the general sense of feeling responsible for the neighborhood, although it did not impact actual behavior as measured by whether residents took some form of action to improve neighborhood safety and livability.

Empirical evidence

The empirical evidence regarding the relationship between disorder or crime in the neighborhood and residents' cohesion, social interactions and/or collective efficacy is mostly cross-sectional, and provides mixed results. A study of adults in Illinois neighborhoods found that higher levels of perceived disorder had a negative relationship with the number of social ties

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reported by residents (Geis and Ross 1998). Likewise, residents who perceived more social disorder reported lower levels of neighboring in a study of residents in Nashville (Woldoff 2002). However, a study of neighborhoods in Chicago found no relationship between reported disorder and informal neighboring (Swaroop and Morenoff 2006). And whereas a study of British residents found that those with a greater fear of crime reported fewer social ties (Sampson 1991), a study of Detroit residents found that those perceiving more nearby crime reported *more* social ties (Adams 1992). Cross-sectional studies have tended to find a more robust negative relationship between perceived neighborhood disorder/crime and residents' reported attachment/cohesion. A study of Nashville residents found a negative relationship between perceiving social disorder and neighborhood attachment (Woldoff 2002), and research in Britain found that residents with a greater fear of neighborhood crime reported lower attachment to the neighborhood (Sampson 1988; Sampson 1991).

Some cross-sectional studies have explored whether or not residents in more disordered neighborhoods, or those perceiving more disorder, engage in more action to improve the neighborhood. A study of residents in Chicago found that those living in neighborhoods with more disorder were more likely to attend community meetings or work with neighbors to solve local problems (Swaroop and Morenoff 2006). Similarly, a study of Nashville residents found that those perceiving more social disorder or crime reported engaging in more informal action to improve the neighborhood (Woldoff 2002). Two studies of seven neighborhoods found that for residents who are not leaders, the neighborhood norms for activism were important for predicting their activity (Foster-Fishman, Collins, and Pierce 2013; Foster-Fishman, Pierce, and Van Egeren 2009). On the other hand, a cross-sectional study of Australian neighborhoods found that residents in neighborhoods with more reported disorder problems did not engage in any more parochial social control, and actually engaged in moderately less public social control (Wickes,

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Hipp, Sargeant, and Mazerolle 2017). Notably, cross-sectional designs have difficulty pulling apart possible reciprocal relationships between disorder and action.

Only a few longitudinal studies conducted recently have explored the relationships between disorder or fear of crime and residents' reported collective efficacy and/or neighboring. A longitudinal neighborhood-level study in Britain found that greater fear of crime operated as a mediator between disorder and reduced neighborhood cohesion (Markowitz, Bellair, Liska, and Liu 2001). Recent longitudinal work by Steenbeek and Hipp (2011) on neighborhoods in Utrecht found that higher levels of disorder at one time point led to lower potential for social control at the next time point (although general cohesion was not impacted). This was also one of the few studies to assess the impact of disorder on actual activity to address problems and found that disorder actually increased behavior to improve the neighborhood.

Summary

There is limited scholarship that expressly assesses the association among neighborhood problems, perceptions of the neighborhood and informal social control actions. No study that we are aware of empirically tests how these relationships influence an individual's own reported action over time. Thus we do not have a solid understanding of the neighborhood and individual level factors that influence residents' informal social control actions and whether these factors differentially influence the exercise of public or parochial informal. Nor do we fully understand how and under what conditions residents update their information on neighborhood processes. With these limitations in mind, we pursue the following research questions:

- Do individuals' perceptions of problems, or neighborhood-level perceived problems, increase or decrease the likelihood that residents will engage in parochial or public informal social control in response to these problems?

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- Do the levels of collective efficacy, social cohesion and neighboring, at the neighborhood or individual level, increase or decrease the likelihood that residents will engage in parochial or public informal social control in response to these problems?
- Does parochial or public informal social control actions taken in response to problems increase residents' own sense of collective efficacy, social cohesion and/or neighboring in the neighborhood? And is this relationship heightened for residents live in neighborhoods experiencing low levels of disorder?
- Do perceptions of problems of individuals, or neighborhood-level perceived problems, reduce residents' collective efficacy, social cohesion or neighboring?
- Do increasing problems in low problem neighborhoods (greater uncertainty) result in lower perceived collective efficacy?

Addressing these questions advances the literature in three specific ways. First, by taking a longitudinal approach to the study of neighborhood problems, neighborhood processes and residents' informal social control actions, we are able to identify the neighborhood and individual level factors that lead to the exercise of parochial and public informal social control at a later point in time. Second, we consider the feedback effects of public and parochial informal social control actions on individual's perceptions of neighboring, cohesion and collective efficacy. Third we assess the extent to which certain types of neighborhood disorder have a stronger impact on residents' perceptions or actions.

METHODOLOGY

Study Design

We use two waves of survey data from the Australian Community Capacity Study (ACCS): a longitudinal panel study of urban communities in Australia that is supported by

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Australia Research Council funding (for more information see <https://accs.project.uq.edu.au>).

The survey comprises 148 randomly drawn neighborhoods¹ from a possible 429 neighborhoods in the Brisbane Division. The average population of the ACCS neighborhoods is about 6,000 (for further information on the ACCS study design please see <https://accs.project.uq.edu.au/>). The ACCS neighborhoods are sized between census tracts in the U.S. (average size of approximately 4,000 inhabitants) and the neighborhoods Sampson et al (1997) identified in Chicago (average size of approximately 8,000 inhabitants). In Brisbane, the ACCS survey has been collected across four waves in 2005, 2008, 2010 and 2012 with a longitudinal sample and a top-up sample. Following the approach of Sampson et al. (1997), we sampled between 20 and 45 persons per neighborhood, sampling greater numbers of participants in more heterogeneous neighborhoods to ensure econometric reliability (see also Raudenbush and Sampson 1999). This study uses survey data from the 3rd and 4th waves given that only these two waves contain all of the questions capturing our variables of interest. The third wave sample comprises 4,389 participants placed into 148 neighborhoods, and wave 4 comprises 4,132 participants; the number of participants in each neighborhood averaged 30, with a standard deviation of 7.3. For the analyses with cohesion, neighboring, and collective efficacy as outcome variables the sample is 2,466 respondents present in both waves 3 and 4; the sample for the models in which social control actions are the outcome is 7,328 problems nested in 2,239 persons present in both waves who observed at least one problem.

The ACCS surveys were conducted by the Institute for Social Science Research at the University of Queensland. Trained interviewers utilized computer-assisted telephone interviewing to administer the survey. The in-scope survey population comprised all people aged

¹ In Australia, the term “suburb” is used to refer to a feature that in the U.S. would be referred to as a “neighborhood”. Throughout, we use the more familiar term “neighborhood” to refer to these. The suburbs in the ACCS sample include those that are adjacent to the main city center and those located in peri-urban areas which have experienced large increases in population growth.

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18 years or over who were usually resident in private dwellings with telephones in the selected neighborhoods in Brisbane². Particular focus was placed on contacting those who had participated in previous waves. All participants were randomly selected. The ACCS sample is similar to the census measures of these neighborhoods for several measures; however, the ACCS sample does slightly over-represent females, home owners, English only speakers, older, married, highly educated, and those who have not moved recently.

It is important to take into account not only the survey wave in which a question was asked, but the temporal information that the question is capturing. For example, when residents assess their neighborhood at waves 3 and 4 on neighboring, cohesion, and collective efficacy (described shortly), they are answering the question at the time of the survey. When respondents are asked to assess whether certain problems were present in the neighborhood, this question asks specifically about problems that have occurred at some point *prior to the survey*. Therefore, these perceptions of problems occur *between* survey waves. And when respondents are asked about actions they took prior to the survey in response to these problems, this information is also clearly *prior to* the perceptions of neighboring and cohesion questions, and therefore these actions occur between survey waves. We maintain this temporal ordering in our modeling strategy. The conceptual model is shown in Figure 1, and shows that our data is at the level of problems (7 types of problems), individuals, and neighborhoods. A perceived problem of type q between waves 3 and 4 (Prob_{q3-4}) impacts activity to address the problem between waves 3 and 4 (Act_{q3-4}), as does the individual's perception of collective efficacy at wave 3 (CE_3) and the neighborhood collective efficacy (N-CE_3). The individual problems are aggregated up to the individual (Prob_{3-4}), the individual actions are aggregated to the individual (Act_{3-4}), and both may

² In Australia, the number of mobile phone only users has only increased recently. 90% of the population was covered by landline phones in 2008, and in 2011 (the last wave of our sample) the number of mobile phone-only users was estimated to still be just 19% (Australian Communications and Media Authority, 2011). By comparison, in the US there were over 45% mobile only users in 2014 (Blumberg and Luke, 2015).

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impact the individual's perception of collective efficacy (CE₄). Furthermore, the number of problems perceived by residents is aggregated to the neighborhood level (N-Prob₃₋₄) as is the activity to address them (N-Act₃₋₄), and these may each impact neighborhood level collective efficacy (N-CE₄).

<<<Figure 1 about here>>>

Variable Information

Dependent variables

One set of outcome variables in this study are the reported actions that residents took in response to identified neighborhood problems. In the survey, the question stub asked respondents if a list of neighborhood issues were: a) not a problem, b) some problem, or c) a big problem. The issues were phrased as: 1) people loitering or hanging out; 2) public drinking; 3) drugs; 4) young people getting into trouble; 5) vandalism and/or graffiti; 6) traffic problems like speeding or street racing; and 7) people being attacked or harassed because of their skin color, ethnic origin, or religion. Across all problems, 55.9% of respondents rated an issue as “not” a problem, 36.7% were rated as “some” problem, and 7.4% were rated as a “big” problem. Just 9.2% of residents did not report any problems (and therefore were not included in the analyses for this outcome measure), 17.8% reported one problem, and 73% reported two or more problems. As awareness of community problems is shown to influence residents' actions (see Foster-Fishman et al., 2007), respondents acknowledging a particular issue as a problem were then asked if they had done anything concrete to resolve the problem in the last 12 months³. If they answered affirmatively, residents chose the response that *best* categorized their action from the following response options: call police; contact government agency; contact local council; contact community group; discuss with neighbors; intervene directly; and other.

³ In wave 3, respondents were only asked about their actions if they rated the problem as a “big problem”.

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We classified the types of action residents took to resolve an identified problem by following the insights of Warner (2007) and Wickes et al (2017). We coded contacting a formal agency (police, government and council) as ‘public social control’, whereas contacting a community group, discussing the problem with neighbors and intervening directly were coded as ‘parochial social control’. The ‘other’ responses were recoded as public or parochial social control as appropriate given respondents’ description of their actions. We therefore distinguish between engaging in public informal control actions, engaging in parochial informal social control actions, or taking no action.

Resident perceptions of neighborhood processes

We are interested in the relationship between residents’ perceptions of neighborhood problems, their actions taken to address these problems and how they influence residents’ assessments of neighborhood processes at wave 4. These measures of neighborhood processes are *neighboring*, perceived *social cohesion* and perceived *collective efficacy* (see Appendix 1 for a list of items for each measure). We describe each of these measures in turn.

Neighboring: In line with a recent focus on “activated ties” (what is referred to in the literature as reciprocated exchange – Sampson 2013), we consider the frequency of pro-social neighborly exchange. The *neighboring* scale contained three items that are reliable at both the individual ($\alpha = 0.76$) and neighborhood ($\alpha = 0.54$) level. The items that comprise this scale are identical to the ones used in the Project for Human Development in Chicago Neighborhoods (PHDCN).

Social cohesion: While there is no agreed upon definition of social cohesion, it is commonly understood as a pro-social good that symbolizes a working trust and a general willingness of residents to work together (Sampson, Morenoff, and Gannon-Rowley 2002). The ACCS *social cohesion scale* comprises four items derived from the PHDCN and specifically focusses on the level of perceived cohesion among neighborhood residents (Sampson, Raudenbush, and Earls

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1997). These items are reliable at both the individual ($\alpha = 0.72$) and neighborhood ($\alpha = 0.81$) level.

Collective efficacy: This measure includes the same items used to measure expectations of informal social control in the original study of neighborhood collective efficacy (Sampson et al., 1997). They represent what Uchida and his colleagues (2014:2) refer to as “the ability of residents to produce social action and meet common goals”. These items are reliable at both the individual ($\alpha = 0.63$) and neighborhood ($\alpha = 0.82$) level. Throughout the rest of the manuscript we refer to this measure as “collective efficacy”, given our earlier argument that we believe it is important to distinguish this from a measure of cohesion.

Independent variables

For the models in which neighboring, cohesion, and collective efficacy at wave 4 are the outcomes, we included similar individual level measures from wave 3 as covariates. We group-mean center these individual-level perceptions of the neighborhood (and the perceptions of problems) as the questions are asking about the neighborhood; therefore the individual-level measure we compute is capturing the extent to which the resident differs from the neighborhood average when assessing this construct. We also included the neighborhood average versions of these measures (again from wave 3) and included them as neighborhood level covariates in these models. In these same models, we constructed a measure of the weighted total number of problems a resident reported at wave 3 (each problem is weighted as 1 if the resident classified it as “some” problem and weighted as 2 if the respondent classified it as a “big” problem). This measure has a reliability of .82; a factor analysis showed very similar loading values, suggesting that factor weights are not needed. We also constructed a measure of the change in the weighted total number of problems a resident reported between waves 3 and 4.

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In the models explaining informal social control *action*, we included variables for the type of problem at the individual level (group-mean centered) and the neighborhood level (neighborhood average). Note that whereas the uncentered “problem” variables are 0/1 depending on whether the respondent reported the problem as “some” (0) or “big” (1), the group-mean centered variables can take on numerous values.

Neighborhood Control Variables

We also included several key neighborhood-level socio-demographic measures from the Australian Census that may be important. In the social disorganization literature, residential instability may can decrease social ties among residents and perceptions of social cohesion and trust (Ross, Reynolds, and Geis 2000; Sampson 1988; Sampson 1991). Length of residence in the neighborhood is also associated with increased neighborhood attachment (Hipp and Perrin 2009). *Residential instability* is measured as the proportion of people living at a different address five years prior, from the ABS 2006 census data. *Ethnic heterogeneity* is a Herfindahl index of five ethnic groups based on country of origin (white, Asian, Africa, Middle East, other) in which higher values indicate more heterogeneous neighborhoods. The socio-economic status of the neighborhood is extensively linked to lower collective efficacy and neighboring (Gijsberts et al., 2011; Letki, 2008; Ross, Mirowsky and Pribesh, 2001; Sampson and Groves, 1989). We therefore include a measure of *median household income* from the ABS 2006 census data.⁴ Finally, as the neighborhoods vary in terms of size, we constructed a measure of *population density* as the total persons per square kilometer using the same source to control for this. Given the collective action problem (Olson 1971), we might expect there to be less action in neighborhoods with higher levels of population density. These neighborhoods are relatively heterogeneous (mean=.689), although the average population of indigenous residents is 2.3%.

⁴ We also assessed whether the level of income inequality in a neighborhood has important consequences by constructing a measure of income inequality as a Gini coefficient. Ancillary models found that this measure was never statistically significant in any of our models.

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The weekly median income is \$1,450, whereas there is a fair amount of variability across neighborhoods in population density as the standard deviation approaches the mean.

Individual Control Variables

To control for individual level characteristics that may influence our measures of collective efficacy, neighboring, cohesion and parochial and public informal social control action, we constructed several measures capturing socio-demographic characteristics: approximate *annual household income* (1 = less than \$20,000, 2 = \$20,000 to \$39,999; 3 = \$40,000 to \$59,999; 4 = \$60,000 to \$79,999; 5 = \$80,000 to \$99,999; 6 = \$100,000 to \$119,999; 7 = \$120,000 to \$149,999; 8 = \$150,000 or more); *highest level of education* (1= post graduate qualifications; 2 = a university or college degree; 3 = a trade, technical certificate or diploma; 4 = completed senior high school; 5 = completed junior high school; 6 = primary school; 7 = no schooling), which was recoded such that higher values indicate higher education; *homeowner*; *length of residence* at the current address (1= less than 6 months; 2 = 6 months to less than 12 months; 3 = 12 months to less than 2 years; 4 = 2 years to less than 5 years; 5 = 5 years to less than 10 years; 6 = 10 years to less than 20 years; 7 = 20 years or more); whether the respondent *has dependent children*. We included measures of marital status (*single, widowed, or divorced*, with married as the reference category), *age* and *age squared* and *female*.

The summary statistics for the variables included in the analyses are presented in Table 1. Among the problems identified by respondents, we see that traffic, drugs, graffiti/vandalism, and young people getting into problems are the most often identified, whereas ethnic harassment is very rarely identified. There is reasonable variability in these problems variables over time at the individual- and neighborhood-level: variability across individuals based on the change measures (based on the standard deviation) is almost identical to that at a point in time. And the variability for the change measures at the neighborhood level is 68%, on average, of the variability at a

single point in time. Likewise, we see that the variability in the change in neighboring, cohesion, and collective efficacy is similar to the variability at a single point in time (both at the individual- and neighborhood-level).

<<<Table 1 about here>>>

Analytic Approach

For the first set of analyses, we estimated multinomial logistic regression models to assess the extent to which neighborhood problems and processes as reported at wave 3 influence parochial and public informal social control actions by individuals at wave 4. Our outcome variables were whether the respondent engaged in 1) parochial informal social control; 2) public informal social control; or 3) took no action. We coded the outcomes such that “took no action” was the reference category. The problems reported by respondents are at level 1, nested in respondents at level 2 and the 148 neighborhoods at level 3. Given that multilevel multinomial logit models encountered estimation problems, the models were estimated using the `mlogit` command in Stata with robust standard errors at the neighborhood level (correcting standard errors at the highest aggregation provides satisfactory results, see Angeles, Guilkey, and Mroz 2005). We tested and found no statistically significant spatial lag effects of the exogenous measures.⁵

In the second set of analyses, for the models with neighboring, cohesion, and collective efficacy as the outcomes, we estimated multilevel linear models. For example, the individual (1) and neighborhood (2) level equations for the cohesion outcome are:

$$(1) \quad y_{ij} = \eta_j + X_{ij}\Gamma_1 + \varepsilon_{ij}$$

$$(2) \quad \eta_j = \tau_j + X_j\Gamma_2 + \delta_j$$

⁵ We followed Morenoff's (2003) approach in estimating models including spatial lags of the exogenous variables. Given that the variables were not statistically significant, and the fit of the models were not improved, we do not present those results.

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where y_{ij} is the level of cohesion reported by the i -th of I respondents in the j -th neighborhood, η_j is the latent variable of cohesion in the neighborhood, X_{ij} is a matrix of exogenous predictors with values for each individual i in neighborhood j to account for compositional effects, Γ_1 is a vector of the effects of these predictors on the subjective assessment, ε_{ij} is a disturbance term for each person, τ_j is the intercept for neighborhood-level cohesion, X_j is a matrix of exogenous predictors with values for each neighborhood j , Γ_2 is a vector of the effects of these predictors, and δ_j is a disturbance term for the neighborhood. There was no evidence of excess collinearity as all variance inflation values were below 5, and no evidence of outliers. Although respondents typically answered all survey questions, we accounted for the small amount of missing data due to nonresponse to specific questions by using multiple imputation with chained equations, as implemented in Stata. Given the modest amount of missing data, we imputed five datasets with which to estimate the models, and corrected the standard errors using Rubin's techniques (Rubin 1976).

RESULTS

Models predicting informal social control action

We begin by asking what brings about residents' public or parochial social control actions in response to problems. We see in Table 2 that individuals who perceive any of these as a big problem are more likely to engage in public social control action and often more likely to engage in parochial social control action (except for ethnic harassment). An individual who perceives neighborhood drugs as a big problem is 1.4 times more likely to engage in public social control action rather than no action compared to someone who perceives them to be some problem ($\exp(.849)-1 = 1.337$). Their likelihood of engaging in parochial social control action is increased 1.23 times ($\exp(.803)-1 = 1.232$). The effects are as strong, and often stronger, when perceiving the other issues as big problems, and it is always the case that perceiving problems as

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big more strongly increases public than parochial social control action. Three of the perceived problems—public drinking, graffiti/vandalism, and traffic—do not bring about parochial social control action but only public social control action.

<<<Table 2 about here>>>

Whereas the individual-level parameters capture the effect of an individual's own perceptions of problems on their likelihood of engaging in action, the neighborhood-level parameters capture the tendency of residents living in neighborhoods in which these problems are strongly perceived to engage in action. We see that neighborhood-level perceptions of all types of problems, except for ethnic harassment, increase the likelihood of individuals in those neighborhoods engaging in public social control action (even controlling for their own perceptions). These are strong effects, as a one standard deviation increase at the neighborhood-level in perceiving public drinking or graffiti/vandalism as problems more than doubles the odds of engaging in public social control action. These neighborhood-level perceptions lead to more parochial social control action when loitering, young people getting into trouble, ethnic harassment, or traffic are perceived as problems. A one standard deviation increase in perceived problems at the neighborhood level for these four types of problems increases the odds of parochial social control action between 100% and 280%.

Turning to the question of whether neighborhood cohesion, neighboring, or collective efficacy (at the individual- or neighborhood-level) translate into action, we detect a robust effect in which residents who report higher levels of neighboring at wave 3 are more likely to engage in both public and parochial social control action in response to observed problems between waves 3 and 4. This mirrors the cross-sectional findings of Wickes et al (2017) using data at just wave 3; the results here demonstrate that neighboring has an enduring effect on the likelihood of engaging in action into the future. A one standard deviation increase in individual-level

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neighboring increases the odds of public social control action 34% ($\exp(.405*.723)-1=.34$) and parochial social control action 30% ($\exp(.366*.723)-1=.303$).

There is evidence that collective efficacy impacts social control actions. We find that residents living in neighborhoods with stronger collective efficacy are more likely to engage in parochial social control actions (but not public social control actions). A one standard deviation increase in neighborhood collective efficacy is associated with 38% increased odds of engaging in parochial social control actions. There is an additional individual level relationship as residents who themselves perceive greater collective efficacy are more likely to engage in informal social control action: a one standard deviation increase in individual-level perceived collective efficacy increases the odds of parochial social control action 53% and public social control action 26%. However, there is no evidence that residents who perceive more social cohesion or who live in neighborhoods in which there are higher levels of social cohesion engage in more social control action.

Feedback effect on individual perceptions of neighborhood-level processes

We next turn to the models asking whether perceptions of problems, and residents' actions in response to these problems, impact their perceptions of neighboring, cohesion, or collective efficacy at the next time point. We highlight that in each model in Table 3 we are controlling for the resident's perception of the outcome measure at wave 3 (group mean centered), as well as the neighborhood-level aggregate of the outcome measure at wave 3, in predicting residents' perceptions at wave 4. Thus, we are capturing the change in residents' perceptions of the outcome measure from wave 3 to wave 4. As expected, there is a positive relationship between residents' own perceptions of these constructs—and the neighborhood-level aggregates of these constructs—with residents' perceptions at the next time point. For example, residents who perceive more neighboring at wave 3 are likely to perceive more neighboring at

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wave 4 ($b=.594$; $p < .01$), and residents in neighborhoods reporting more neighboring at wave 3 report more at wave 4 ($b=.262$; $p < .01$). Likewise, residents who report higher levels of collective efficacy at wave 3 ($b=.608$; $p < .01$) and those in neighborhoods with higher levels of these expectations at wave 3 ($b=.141$; $p < .01$) report higher collective efficacy at wave 4. A similar pattern is found for cohesion.

<<<Table 3 about here>>>

We see relatively consistent evidence that residents' perceptions of problems in the neighborhood impact their assessment of these three neighborhood attitudinal measures. We detect evidence of updating by residents, as those who perceived more problems before wave 3 report lower perceived collective efficacy at wave 4 ($b = -.061$; $p < .01$), and those who perceive an increase in problems from wave 3 to wave 4 also report lower perceived collective efficacy at wave 4 ($b = -.071$; $p < .01$). Interpreting these as standardized effects, one standard deviation higher perceived problems at wave 3 are associated with .246 standard deviations lower collective efficacy, and a one standard deviation increase in perceived problems between the two waves is associated with .294 standard deviations lower collective efficacy. There is an additional contextual effect, as residents living in neighborhoods that perceived more problems before wave 3 report lower perceived collective efficacy at wave 4 ($\beta = -.143$), and those in neighborhoods in which there is an increase in problems from wave 3 to wave 4 also report lower perceived collective efficacy at wave 4 ($\beta = -.236$). The size of these effects are much stronger than for the neighboring model, implying that the perceived presence of problems, or the increase in perceived problems in the neighborhood, negatively impact residents' assessment of the ability of the neighborhood to engage in action much more strongly than they impact residents' sense of socializing activity. This is consistent with the idea that this represents residents updating their sense of collective efficacy in response to this new information (Hipp

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2016). We also see that individuals' perceptions of these problems have a similarly sized negative impact on their perceptions of cohesion in the neighborhood at the next time point. This highlights that the sense of cohesion in the neighborhood is at least somewhat distinct from the sense of socializing that occurs. However, the neighborhood-level measure of problems is not significantly related to levels of social cohesion at the next time point; this emphasizes that sense of cohesion in the neighborhood is also distinct from residents' sense of expectations about informal social control capability.

As to the question of whether informal social control activity feeds back onto residents' perceptions of the neighborhood, we detect mixed results. Regarding public social control actions, we see that residents who engage in more of these activities between the waves report more neighboring at wave 4 ($b=.043$; $p < .01$). However, the relationship between engaging in public social control actions and subsequent reports of cohesion or collective efficacy at the next wave are not statistically significant. And there is no evidence that residents who live in neighborhoods where more public social control activity is taking place have increased perceptions of neighboring, social cohesion, or collective efficacy at the next time point.

There is, however, more evidence that residents who engage in parochial social control actions have different perceptions at the next time point. Residents who engage in more parochial social control actions report more neighboring at the next wave ($b=.065$; $p < .01$). And the impact of these actions on residents' perceptions of the neighborhood's level of collective efficacy is also very strong ($b=.123$; $p < .01$), suggesting a direct feedback effect of residents' actions on their sense of the neighborhood's capability to engage in such activity (Hipp 2016). It is interesting to note that engaging in either public or parochial social control activity was not significantly associated with residents' subsequent assessment of the level of cohesion in the neighborhood. Thus, these parochial social control activities appear to increase the perception of

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neighboring, and residents' sense of the neighborhood's capability to engage in informal social control, but they do not impact residents' sense of neighborhood cohesion. We also see no evidence that residents who live in neighborhoods in which there is more parochial social control activity taking place have increased perceptions of neighboring, social cohesion, or collective efficacy at the next time point.

Effect of uncertainty: informal social control action in low disorder environments

Next, we assessed Hipp's (2016) hypothesis that in low disorder environments residents will be more uncertain about the level of collective efficacy and therefore informal social control activity will more strongly increase perceived collective efficacy in these contexts. We assess this by estimating additional models that include interactions between this activity and the level of reported problems. We plot the relationship for the interaction between residents' own perceptions of problems and public social control action, and find that whereas more public social control action moderately increases the level of perceived collective efficacy for individuals who perceive many problems in the neighborhood (the bottom line of Figure 2) there is a very strong positive relationship between public social control action and perceived collective efficacy for residents who previously perceived relatively few problems (the top line in Figure 2). This interaction effect was not present for parochial social control action and individual perceptions of problems. There was also an interaction effect for neighborhood levels of parochial social control action and individual perceived problems, as shown in Figure 3. We see that residents who perceive many problems in the neighborhood actually report lower collective efficacy when there is more parochial social control action in the neighborhood (the bottom line of Figure 3). Finally, when testing the interactions between social control action and the general perception of problems in the neighborhood, we find an interaction effect for public social control action. Whereas there is effectively no relationship between the amount of public

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social control action an individual engages in and collective efficacy in neighborhoods with high numbers of problems (the bottom line in Figure 4), there is a strong positive relationship in neighborhoods with few problems (the top line in Figure 4). Again, this is consistent with the notion of greater updating in a context of more uncertainty regarding collective efficacy.

<<<Figures 2, 3 and 4 about here>>>

Specific types of problems

In our final set of analyses, we break out the problems measures by the seven different types of problems (rather than simply aggregating them). The results are displayed in Table 4, and demonstrate that certain types of problems (particularly those relating to social disorder) have a stronger impact on residents' own assessments of the neighborhood. Earlier, we found that perceiving people loitering as a problem was particularly likely to lead to action on the part of residents, and here we see that residents perceiving this particular problem at the prior time point, or perceiving this as an increasing problem, report lower perceptions of cohesion and collective efficacy in the neighborhood. Furthermore, these are among the largest coefficients observed among the different specific problems, suggesting this is a particularly important problem for shaping residents' perceptions. Whereas we saw that perceiving drugs as a problem brought about action on the part of residents, it also has a quite strong negative effect on residents' perceptions of the neighborhood. Thus, residents who perceive drugs as a problem, and especially those who perceive it as an increasing problem, report lower levels of cohesion and collective efficacy in the neighborhood. Regarding public drinking, those who perceive this as a problem report lower neighboring, and those who perceive it as an *increasing* problem report reduced collective efficacy in the neighborhood.

>>>Table 4 about here>>>

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Earlier we saw that perceiving traffic as a problem was particularly likely to bring about public social control action, and here we see that residents who perceive this as a problem report lower levels of cohesion and collective efficacy in the neighborhood; however, there is no evidence that this as an increasing problem impacts these perceptions. Those who perceive more graffiti/vandalism in the neighborhood also report lower collective efficacy. Again, there is no evidence that perceptions of ethnic harassment impact residents' perceptions of collective efficacy or neighboring.

In contrast, perceiving young people getting into trouble as a problem exhibits a very peculiar pattern in that it shows a *positive* relationship with subsequent perceptions of neighboring and collective efficacy, when controlling for perceptions of other problems. Note that when we estimated ancillary models that did not control for other perceived problems, residents who perceived young people getting into trouble as a problem or as an increasing problem subsequently report *less* cohesion and collective efficacy (but no relationship with neighboring). Thus, there is something about perceiving a problem of young people *at the same time as perceiving other problems* that actually results in higher perceived neighboring and collective efficacy at the next time point. And this is not a statistical collinearity issue, as the correlation between perceiving youth as a problem and each of the other problems is less than .5 (and the correlation of the change measures is typically around .2). There is also an additional contextual effect in which residents living in neighborhoods that report more young people getting into trouble report *greater* collective efficacy, when controlling for these other types of problems.

The effects are weaker for the neighborhood-level aggregations of perceived problems by type of problem. In neighborhoods in which the perception of loitering as a problem is increasing between waves, residents report lower levels of perceived cohesion. However, there

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is no evidence that any of the other types of problems (other than young people getting into trouble), or how they are changing, are significantly associated with these resident perceptions.

Conclusion

This study has utilized a longitudinal study design to explore the interdependent relationship between residents' perceptions of neighboring, cohesion, or collective efficacy, perceived neighborhood problems, and the social control actions they take to address these problems. We have emphasized the interdependence of these neighborhood processes. Residents' perceptions that various issues are problems are important for understanding whether they actually engage in activity to address the problem; furthermore, there is a contextual effect in which residents living in neighborhoods with greater perceived problems are more likely to engage in activity to address the problem. And residents' perception of problems in the neighborhood, or the extent to which they perceive that problems are increasing, reduces residents' sense of collective efficacy in the neighborhood. There was also a contextual effect in which residents living in neighborhoods in which more problems are perceived, or there is a perception of increasing problems, report reduced collective efficacy in the neighborhood. We next discuss four key results obtained in this study.

The first key finding was that residents tended to update their sense of cohesion and collective efficacy in the neighborhood in a rather pronounced pattern (Hipp 2016). There was consistent evidence that individuals who perceive more problems in the neighborhood, and those who live in a neighborhood in which residents perceive more problems, report lower collective efficacy in the neighborhood, as well as less neighboring at the next time point. This updating of residents' sense of collective efficacy highlights that this is not a static measure of a neighborhood, but rather can change based on conditions and activity in the neighborhood. We found that increasing numbers of problems in a neighborhood reduced residents' collective

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efficacy, which is consistent with the notion that residents update their beliefs regarding the level of collective efficacy when faced with the observation of increasing problems in the neighborhood. Thus, residents will change their assessment of collective efficacy in the face of increasing neighborhood problems.

We also found that residents update their assessment of collective efficacy in response to their own parochial social control actions. This is also consistent with our hypothesizing, as residents who engage in actions are arguably receiving positive feedback regarding the level of collective efficacy in the neighborhood, and therefore it is reasonable that they would revise upward their assessment of it. Interestingly, this effect only operated for those who actually engaged in action; there was no evidence that the level of activity in the neighborhood beyond an individual's activity impacts collective efficacy. Furthermore, there was evidence that engaging in more public social control actions had a particularly strong positive relationship with collective efficacy for residents who perceive few problems in the neighborhood or for residents living in neighborhoods reporting few problems; this result is consistent with Hipp's (2016) hypothesis that action that occurs in a context of higher uncertainty regarding collective efficacy can result in stronger updating.

A second key finding was that residents who report more collective efficacy engage in more parochial and public social control action at the next time point. There was a reinforcing effect in which higher levels of neighborhood-level collective efficacy brought about action. This individual-level finding is in contrast to the free-rider problem, as it was *not* the case that residents who perceive more collective efficacy are less likely to engage in informal social control action through free-riding on the actions of others (Olson 1971). The finding is, however, consistent with collective efficacy theory, as there was a neighborhood-level effect for all residents in the neighborhood for parochial social control action. The fact that we found a

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similar positive effect for those perceiving greater levels of neighboring may suggest that a social influence effect is also responsible for these results. This is clearly speculative, and suggests a direction for future research.

The third key finding is that perceiving more serious neighborhood problems at both the individual and neighborhood level increased the likelihood of residents engaging in action in response to it. This is an important result, as an alternative possibility is that residents who perceive more serious problems would be less likely to engage in action as they would instead retreat into a sense of hopelessness regarding the conditions of the neighborhood. Furthermore, we found that the problem of people loitering appeared to be the most galvanizing for residents at the neighborhood level. The fact that people loitering not only brought about more action, but also had a particularly strong negative impact on residents' sense of cohesion and collective efficacy, highlights that this is a problem that scholars should pay particularly close attention to in future research. In fact, more carefully exploring which problems are most troublesome to residents, or which are most likely to engender action, would be a useful future direction for research. A related, but contrasting finding was that the perception of young people as a problem actually was positively associated with neighboring and collective efficacy at the next time point (when controlling for other problems); this same surprising finding was detected for the neighborhood-level measure of perceptions of young people as a problem. It may be that concerns over the safety and security of young people may be more likely to encourage engagement of parents and other responsible adults in the neighborhood.

The fourth key finding was that residents who perceive higher levels of neighboring engage in more public and parochial social control activity. This result is consistent with cross-sectional research using the previous wave of this survey (Wickes, Hipp, Sargeant, and Mazerolle 2017). We found neighboring has long-term effects on residents' actions that

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extended over the two years of these survey waves. This highlights the importance of resident social networks. Although some recent research has called into question the importance of resident social networks for neighborhood action (Browning 2009) and sometimes emphasized the possible conflicting normative influences that can occur within such networks (Browning, Feinberg, and Dietz 2004; Pattillo 1998), these networks nonetheless appear important for encouraging informal social control actions. We argue that there are two possible explanations for this finding. First, as there is a degree of risk associated with any informal social control action, the presence of social ties in the neighborhood may, at least in part, mitigate repercussions that come from taking action. For example, in a street where residents are familiar with each other, individuals may be more confident that taking action when a problem arises will not evoke retaliation. In an early study of neighborhood participation in New York, individuals who engaged in higher levels of neighboring were more likely to participate in block group associations, leading Perkins and colleagues (Perkins, Florin, Rich, Wandersman, and Chavis 1990) to argue that the social climate was more important in predicting participation than the demographic or criminogenic context of the neighborhood (see also, Perkins, Brown, and Taylor 1996). Second, the greater the social connections in the neighborhood, the more likely residents will be aware of problems facing the collective. In their study of resident action, Peterson and Reid (2003) found that when individuals were aware of substance use problems in a neighborhood, they were more likely to engage in community prevention actions.

We acknowledge some limitations to this study. First, we only had data for residents in a single city, and therefore must be cautious in generalizing these results to other cities. Second, we only had two waves of data for our analyses as only waves 3 and 4 of the ACCS survey contained questions pertaining to resident action. Overtime, it is possible that continued inaction will have particularly deleterious consequences for the neighborhood, however, at present, there

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are no data sources we are aware of that can test this assertion. Third, a problem of longitudinal data is that we cannot observe residents who moved out between waves: whereas we found that those in our sample who detected the most problems between waves were the most likely to engage in action, it is possible that detecting problems also enhances mobility out of the neighborhood and therefore we would not have such persons in our sample. Our final limitation pertains to our measures of action. We asked residents to comment on action for relatively serious problems. It is possible that actions undertaken for less serious problems have an even greater impact on residents' sense of collective efficacy. We propose that future research consider a wider range of actions.

This study has emphasized the importance of studying the interdependence of residents' perceptions of problems in the neighborhood, their perceptions of neighboring and collective efficacy in the neighborhood, and their actual activity to address problems. The results using a longitudinal study design with two waves of survey data have highlighted that these neighborhood processes are indeed interdependent in important ways. There is strong evidence that residents update their sense of collective efficacy in the neighborhood both in response to increasing levels of problems in the neighborhood, as well as in response to their own activities to address these problems. This updating highlights the importance of studying neighborhoods as dynamic entities in which residents not only observe and perceive the environment, but their actions can then impact others' observations and perceptions. Throughout these various actions, we have seen that residents' social networks are nonetheless important for bringing about informal social control action on the part of residents, emphasizing the enduring importance of social networks among residents.

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Tables and Figures

	Individual level		Neighborhood level		Change for individuals		Change for neighborhood	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Dependent variables								
Public informal social control actions	0.104	0.305						
Parochial informal social control actions	0.047	0.212						
Neighboring, wave 4	0.022	0.706						
Perceived collective efficacy, wave 4	0.175	1.377						
Perceived cohesion, wave 4	0.070	0.798						
Reported problem								
Drugs big problem	0.939	0.626	0.799	0.268	0.019	0.620	0.028	0.161
Public drinking big problem	0.656	0.621	0.561	0.218	-0.099	0.620	-0.110	0.154
People loitering big problem	0.632	0.629	0.542	0.239	-0.101	0.618	-0.116	0.141
Ethnic harassment big problem	0.247	0.482	0.213	0.190	-0.057	0.425	-0.068	0.114
Graffiti/vandalism big problem	0.872	0.614	0.738	0.237	-0.100	0.624	-0.097	0.155
Traffic big problem	1.086	0.589	0.974	0.186	-0.086	0.652	-0.071	0.165
Young people getting into trouble big problem	0.776	0.583	0.662	0.227	-0.178	0.621	-0.171	0.162
Perceptions of neighborhood								
Neighboring, wave 3	0.000	0.723	-0.303	0.243	0.022	0.810	-0.170	0.239
Perceived collective efficacy, wave 3	-0.009	1.452	-0.071	0.331	0.184	1.557	0.149	0.389
Perceived cohesion, wave 3	-0.004	0.848	-0.264	0.324	0.074	0.955	0.054	0.268
Household-level variables								
Household income	4.496	2.192						
Education	3.715	1.355						
Length of residence	5.620	1.210						
Owner	14.1%							
Widow	6.4%							
Divorced	10.6%							
Single	12.4%							
Married	70.6%							
Female	61.5%							
Age	52.3	14.7						
Children	0.722	1.108						
Neighborhood-level variables								
Median income (weekly)			1450.5	427.4				
Residential instability			-0.066	0.624				
Ethnic heterogeneity			0.689	0.122				
Proportion Indigenous			0.023	0.018				
Population density (1,000's per square kilometer)			11.4	8.7				
<p>Note: neighborhood-level measures are based on full sample of 4,130 respondents present at wave 4. Individual and household measures are based on subsample of 2,239 respondents reporting on 7,328 problems.</p>								

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Table 2. Multinomial logit models predicting various actions before wave 4 to address problems in the neighborhood. Reference category is no action.

	Public social control		Parochial social control	(a)
<i>Neighborhood level reported problem (reference is neighborhood drugs problem)</i>				
Neighborhood drugs a problem	0.815 ** (3.07)		0.193 (0.55)	
Public drinking a problem	0.868 * (2.45)		0.598 (1.25)	
People loitering a problem	1.124 ** (3.22)		0.959 * (2.31)	
Young people getting into trouble a problem	0.864 * (2.49)		0.829 * (2.20)	
Graffiti/vandalism a problem	0.929 ** (3.03)		0.302 (0.74)	
Ethnic harassment a problem	0.930 (1.67)		1.342 * (2.14)	
Traffic a problem	1.321 ** (5.31)		0.684 * (2.08)	
<i>Individual level reported problem (reference is neighborhood drugs problem)</i>				
Neighborhood drugs a problem	0.849 ** (4.00)		0.803 * (2.39)	
Public drinking a problem	0.895 * (2.56)		0.093 (0.19)	
People loitering a problem	1.060 ** (4.13)		0.784 ** (2.58)	
Young people getting into trouble a problem	0.655 * (2.12)		0.597 * (2.04)	
Graffiti/vandalism a problem	0.906 ** (2.92)		0.719 (1.43)	
Ethnic harassment a problem	0.810 (1.45)		-0.017 (-0.02)	
Traffic a problem	1.368 ** (9.49)		0.477 (1.71)	**

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<i>Neighborhood climate</i>				
Neighboring	-0.206		0.068	
	-(0.54)		(0.15)	
Cohesion	0.155		-0.381	
	(0.45)		-(0.69)	
Collective efficacy	0.192		0.981 **	
	(0.60)		(2.92)	
<i>Individual perceptions of neighborhood climate (wave 3)</i>				
Neighboring	0.405 **		0.366 **	
	(5.03)		(3.23)	
Perceived cohesion	-0.034		0.011	
	-(0.43)		(0.11)	
Collective efficacy	0.157 *		0.292 **	
	(2.02)		(2.69)	
<i>Neighborhood measures (wave 3)</i>				
Median income (1,000's)	-0.195		-0.516	
	-(0.70)		-(1.07)	
Residential instability	0.106		0.135	
	(0.71)		(0.92)	
Ethnic heterogeneity	0.236		0.130	
	(0.60)		(0.28)	
Proportion Indigenous	3.779		1.956	
	(0.86)		(0.28)	
Population density (1,000's)	-0.087		-0.210	
	-(1.06)		-(1.87)	
<i>Individual and household measures</i>				
Household income	0.013		-0.023	
	(0.35)		-(0.50)	
Education	0.024		0.075	
	(0.56)		(1.46)	
Length of residence	0.052		0.016	
	(0.99)		(0.25)	
Owner	0.032		0.249	
	(0.21)		(1.13)	
Widow	-0.024		-0.133	
	-(0.11)		-(0.40)	

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Divorced	-0.502 *		-0.194	
	-(2.09)		-(0.78)	
Single	0.057		-0.110	
	(0.29)		-(0.43)	
Female	-0.223 *		-0.369 **	
	-(2.16)		-(2.79)	
Age	10.064 **		3.319	
	(3.22)		(0.93)	
Age squared	-0.097 **		-0.042	
	-(3.36)		-(1.22)	
Children	0.034		0.016	
	(0.61)		(0.24)	
Intercept	-6.989 **		-4.181 **	
	-(6.11)		-(3.19)	
Pseudo r-square	0.082		0.045	
<p><i>Note: ** $p < .01$; * $p < .05$. T-values in parentheses. Pseudo r-squares are from logit models for single outcome. N is 2,239 respondents reporting on 7,328 problems.</i></p> <p><i>(a): significance test between public and parochial social control</i></p>				

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Table 3. Models predicting change in neighboring, expectations of informal social control, and cohesion from wave 3 to wave 4

	Neighboring		Collective efficacy		Cohesion	
Individual-level outcome measure at previous wave	0.594 ** (35.79)		0.608 ** (36.22)		0.510 ** (27.42)	
Neighborhood-level outcome measure at previous wave	0.262 ** (4.73)		0.141 * (2.40)		0.183 ** (2.85)	
Neighborhood perceived problems						
Perceived problems at previous wave	-0.029 (-1.50)		-0.125 ** (-3.09)		-0.036 (-1.49)	
Change in perceived problems between waves	-0.017 (-0.98)		-0.083 * (-2.29)		-0.034 (-1.55)	
Individual perceived problems						
Perceived problems at previous wave	-0.010 (-1.79)		-0.061 ** (-5.66)		-0.049 ** (-7.14)	
Change in perceived problems between waves	-0.004 (-0.64)		-0.071 ** (-6.73)		-0.048 ** (-7.13)	
Neighborhood social control actions						
Number of public social control actions	0.055 (0.68)		0.074 (0.45)		0.030 (0.31)	
Number of parochial social control actions	-0.081 (-0.59)		-0.324 (-1.20)		-0.277 (-1.71)	
Individual social control actions						
Number of public social control actions	0.043 ** (2.73)		0.006 (0.22)		0.028 (1.54)	
Number of parochial social control actions	0.065 ** (2.58)		0.123 ** (2.63)		0.036 (1.20)	

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Individual level measures			
Household income	0.004 (0.51)	0.011 (0.86)	-0.002 (-0.19)
Education	0.002 (0.19)	-0.030 (-1.76)	-0.008 (-0.74)
Length of residence	0.041 ** (3.56)	-0.002 (-0.11)	-0.004 (-0.29)
Owner	0.018 (0.42)	-0.146 (-1.86)	-0.153 ** (-3.09)
Widow	0.017 (0.36)	0.014 (0.16)	0.007 (0.13)
Divorced	-0.059 (-1.46)	-0.079 (-1.05)	-0.037 (-0.77)
Single	-0.031 (-0.69)	0.056 (0.67)	0.042 (0.79)
Female	0.014 (0.61)	0.085 (1.95)	0.027 (0.98)
Age	0.000 (-0.08)	-0.001 (-0.24)	-0.001 (-0.45)
Children	0.027 * (2.18)	0.017 (0.77)	0.019 (1.32)
Neighborhood level measures			
Median income	0.000 ** (-2.86)	0.000 (-0.53)	0.000 (0.49)
Residential instability	0.003 (0.15)	-0.003 (-0.06)	-0.036 (-1.36)
Ethnic heterogeneity	0.030 (0.17)	-0.241 (-0.67)	0.006 (0.03)
Percent indigenous	-1.139 (-0.98)	-1.946 (-0.84)	-1.722 (-1.22)
Population density	-0.001 (-0.33)	-0.002 (-0.57)	-0.004 * (-2.12)
Intercept	0.195 (0.77)	1.490 ** (2.91)	0.547 (1.77)

Note: ** $p < .01$; * $p < .05$. T-values in parentheses. N is 2,466 respondents in 148 neighborhoods

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Table 4. Models predicting change in neighboring, expectations of informal social control, cohesion, and collective efficacy from wave 3 to wave 4. Model splitting perceived problems by type.

	Neighboring		Collective efficacy		Cohesion	
	(1)		(1)		(1)	
Individual-level outcome measure at previous wave	0.587 ** (32.69)		0.601 ** (32.95)		0.496 ** (25.01)	
Neighborhood-level outcome measure at previous wave	0.255 ** (3.68)		0.094 (1.29)		0.240 ** (3.10)	
Neighborhood-level change in perceived problems between waves						
Drugs problem	0.063 (0.52)		-0.182 (-0.78)		0.166 (1.15)	
Public drinking problem	0.022 (0.19)		0.347 (1.57)		0.300 * (2.26)	
People loitering problem	-0.161 (-1.21)		-0.870 ** (-3.46)		-0.358 * (-2.33)	
Young people getting into trouble problem	0.015 (0.12)		0.274 (1.13)		-0.053 (-0.36)	
Graffiti/vandalism problem	-0.109 (-0.89)		-0.283 (-1.21)		-0.074 (-0.52)	
Ethnic harassment problem	0.132 (0.63)		-0.954 * (-2.34)		-0.497 * (-2.05)	
Traffic problem	-0.154 (-1.61)		0.255 (1.39)		-0.024 (-0.22)	
Neighborhood-level perceived problems at previous wave						
Drugs problem	-0.042 (-0.27)		-0.536 (-1.80)		0.020 (0.11)	
Public drinking problem	0.180 (1.20)		0.087 (0.31)		0.133 (0.78)	
People loitering problem	-0.180 (-1.17)		-0.471 (-1.66)		-0.039 (-0.23)	
Young people getting into trouble problem	0.025 (0.14)		0.747 * (2.19)		0.115 (0.56)	
Graffiti/vandalism problem	-0.027 (-0.22)		-0.231 (-0.97)		-0.172 (-1.19)	
Ethnic harassment problem	-0.027 (-0.14)		-0.607 (-1.64)		-0.273 (-1.25)	
Traffic problem	-0.155 (-1.63)		-0.072 (-0.40)		-0.151 (-1.38)	

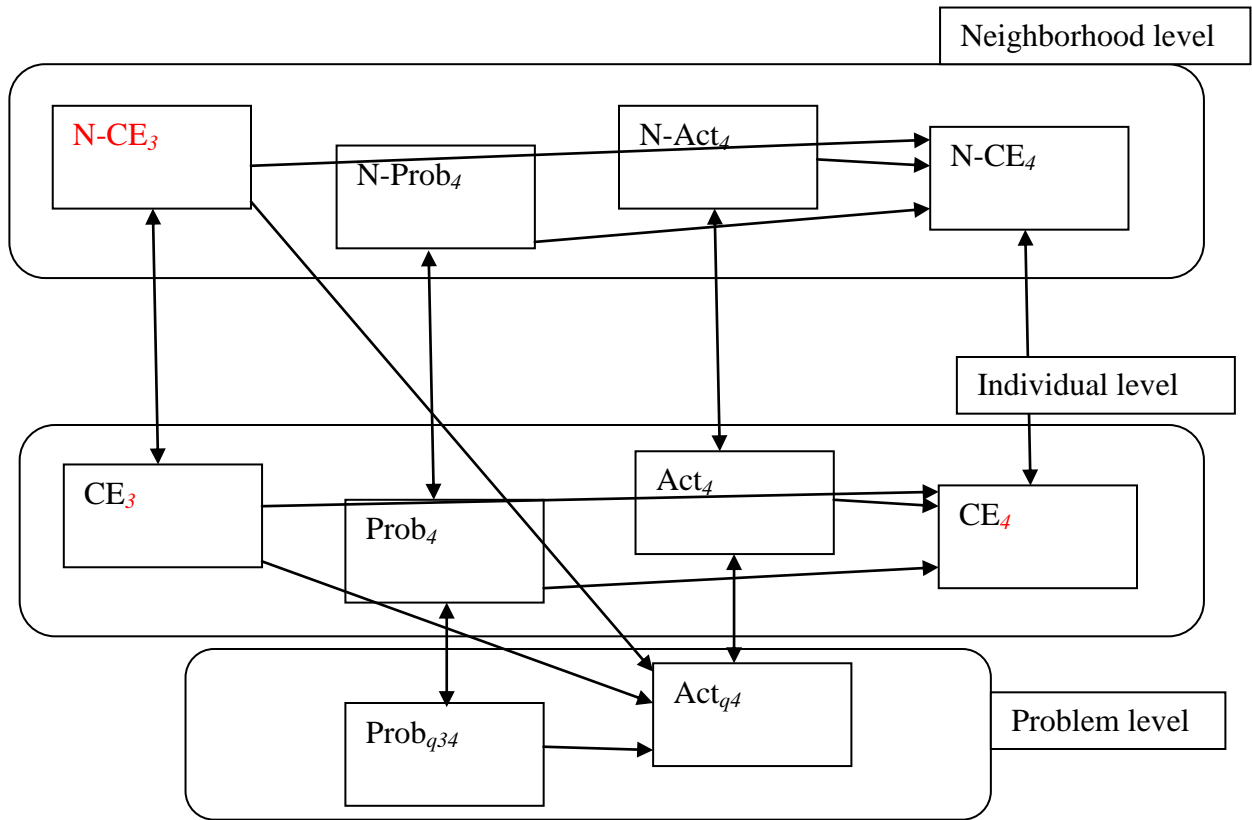
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Individual-level change in perceived problems between waves				
Drugs problem	-0.001 (-0.05)		-0.187 ** (-4.11)	-0.128 ** (-4.44)
Public drinking problem	-0.038 (-1.38)		-0.104 * (-2.04)	-0.044 (-1.38)
People loitering problem	-0.005 (-0.20)		-0.139 ** (-2.73)	-0.071 * (-2.23)
Young people getting into trouble problem	0.041 (1.43)		-0.010 (-0.20)	-0.047 (-1.42)
Graffiti/vandalism problem	-0.039 (-1.55)		-0.074 (-1.59)	-0.039 (-1.33)
Ethnic harassment problem	0.032 (0.75)		-0.041 (-0.53)	-0.051 (-1.05)
Traffic problem	-0.006 (-0.27)		-0.068 (-1.58)	-0.016 (-0.57)
Individual-level perceived problems at previous wave				
Drugs problem	0.012 (0.42)		-0.139 ** (-2.59)	-0.085 * (-2.52)
Public drinking problem	-0.075 * (-2.24)		-0.039 (-0.64)	-0.035 (-0.91)
People loitering problem	-0.033 (-0.99)		-0.204 ** (-3.28)	-0.122 ** (-3.12)
Young people getting into trouble problem	0.093 * (2.56)		0.132 * (1.98)	-0.030 (-0.72)
Graffiti/vandalism problem	-0.031 (-1.03)		-0.123 * (-2.21)	-0.052 (-1.49)
Ethnic harassment problem	-0.006 (-0.12)		-0.099 (-1.08)	-0.046 (-0.80)
Traffic problem	-0.048 (-1.80)		-0.123 * (-2.45)	-0.069 * (-2.23)

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Neighborhood-level social control actions							
Number of formal actions	0.130			0.066			0.051
	(1.48)			(0.40)			(0.50)
Number of informal actions	0.005			-0.294			-0.259
	(0.03)			-(1.01)			-(1.48)
Individual-level social control actions							
Number of formal actions	0.039 *			0.026			0.042 *
	(2.37)			(0.84)			(2.20)
Number of informal actions	0.049			0.138 **			0.044
	(1.88)			(2.86)			(1.47)
<p><i>Note: ** $p < .01$; * $p < .05$. T-values in parentheses. N is 2,466 respondents in 148 neighborhoods. Models include same individual-level and neighborhood-level control variables as in Table 3.</i></p>							

Figure 1. Conceptual model for analyses: three levels (problem, individual, neighborhood)



Legend:

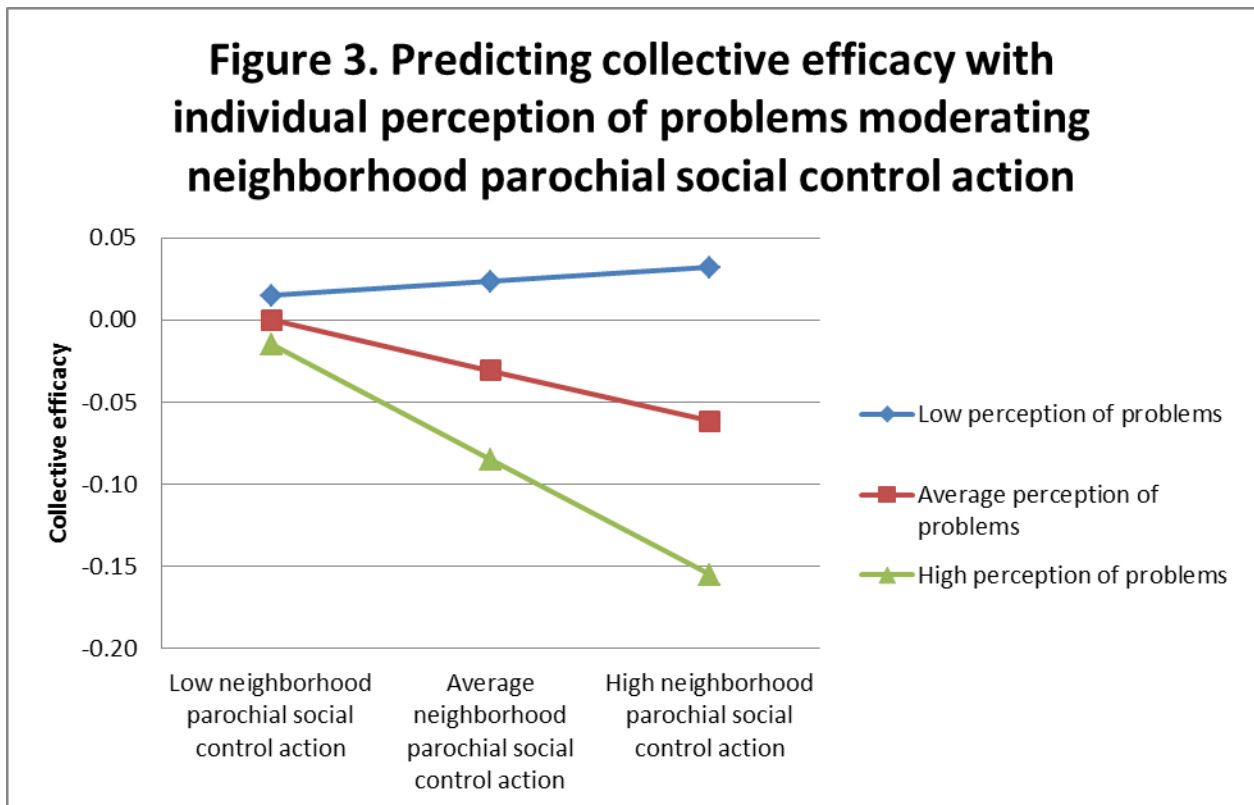
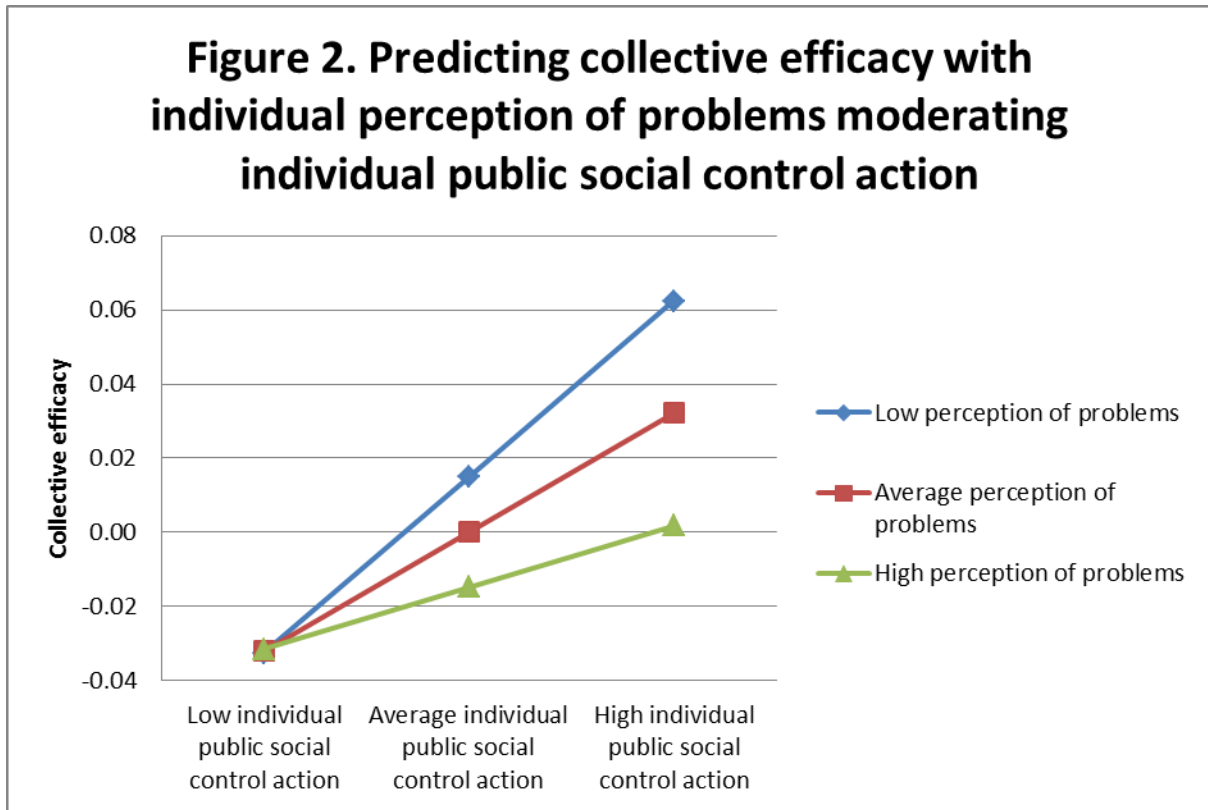
CE: collective efficacy

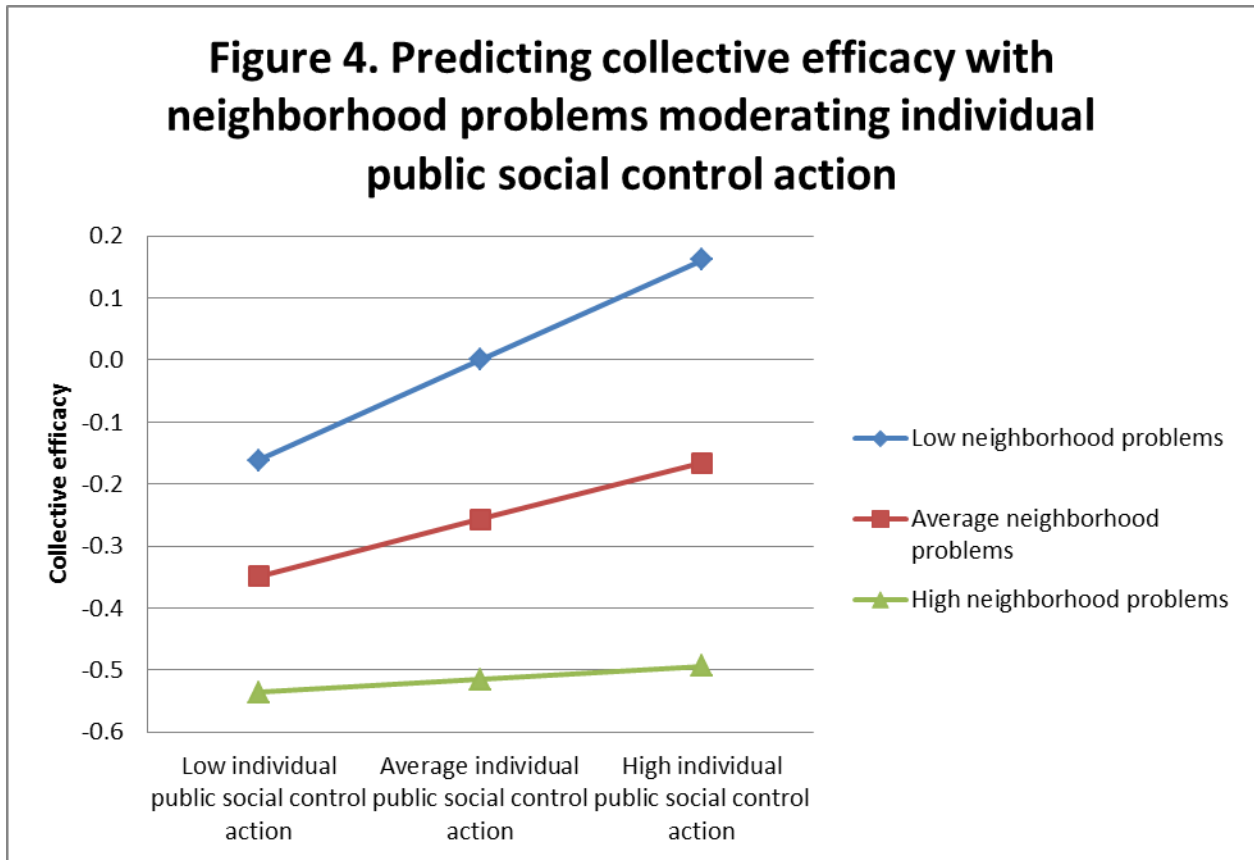
Prob: Perceived problem

Act: Activity to address problem

N-: Neighborhood-level aggregation

q: type of problem





Appendix

Table A1. Items Comprising Key Variables

Variable	Items
<i>Collective efficacy</i>	<ul style="list-style-type: none"> • If a group of community children were skipping school and hanging around on a street corner, how likely is it that people in your community would do something about it? • If some children were spray painting graffiti on a local building, how likely is it that people in your community would do something about it? • If a child was showing disrespect to an adult, how likely is it that people in your community would scold that child? • Suppose that because of budget cuts the fire station closest to your home was going to be closed down. How likely is it that community residents would organize to try and do something to keep the fire station open? • If there was a fight in front of your house and someone was being beaten or threatened, how likely is it that people in your community would break it up? <p>Response categories: Very likely, likely, neither likely nor unlikely, unlikely, very unlikely</p>
<i>Perceived social cohesion</i>	<ul style="list-style-type: none"> • People in this community are willing to help their neighbours • This is a close-knit community • People in this community can be trusted • People in this community do not share the same values <p>Response categories: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree</p>
<i>Neighboring</i>	<p>Based on your experiences, about how often to you and people in your community:</p> <ul style="list-style-type: none"> • Do favours for each other? • Ask each other advice about things such as child rearing or job openings? • Visit in each other's homes or on the street? <p>Response categories: Often, sometimes, rarely, never</p>