

A New Look at Neighborhood-Level Informal Social Control:

Solving Social Dilemmas of Achieving Public Order

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ABSTRACT

Investigation of informal social control occupies a central position in the field of neighborhood-level crime research within social disorganization tradition. The present study revisits this issue by bridging it with another important area of research – study on social dilemmas that explains prosocial or collective behavior in human groups. By defining informal social control as one form of collectively desirable action, the study tested the hypothesis that solutions to social dilemmas developed by game theorists for achieving cooperation would also increase neighborhood-level informal social control. The examination of multilevel data found that most of the hypothesized factors (i.e. reciprocity, low cost to cooperation, intimacy, communication, and expectation) directly or indirectly facilitate residents' willingness to participate in informal social control behavior, and therefore, the study validates the application of social dilemma perspective to the study of neighborhood-level informal social control.

INTRODUCTION

One of the most important questions in the field of neighborhood-level crime research has been the investigation of informal social control. According to social disorganization theory which is viewed as the aggregate level control theory of crime, crime in residential communities is fundamentally a function of informal social control, meaning that it is the absence of informal social control, not the presence of criminal constructs that gives rise to crime and delinquency. This premise of social disorganization theory has been validated by a large number of empirical studies which have consistently found that the strength of informal social control mediates the effects of structural disadvantages of a neighborhood on the rates of crime and delinquency. Since the relationship between the breakdown of informal social control and crime was established, the primary research focus in neighborhood-level crime research has recently shifted to the explanation of informal social control and a considerable number of studies in this respect have emerged. Although, those studies have identified a set of factors that accounts for the variation in the strength of informal social control, the theoretical discussion of the mechanisms behind this variation is still at a rudimentary level, thereby failing to guide the empirical analysis.

The lack of theoretical construction in explaining informal social control, as far as I'm concerned, is primarily due to the obscure understanding of the nature of informal social control. The current study, on the other hand, clearly defines informal social control as residents' behavioral choice toward promoting public order, thereby identifying informal social control as one form of prosocial actions. By doing that, the research question of neighborhood-level informal social control becomes that of when and why residents act prosocially to intervene in activities against deviance.

Game theory, through its explanation of social dilemmas, explores the mechanisms driving behavioral choices in situations where there is a tension between individual and collective rationality and may, therefore, provide a theoretical approach that would help to explain the underlying mechanisms accounting for the variation in the strength of informal social control at the neighborhood level. More specifically, game theory assumes rational individuals and attempts to explain why and when people behave to promote the common good when their individual interests are at odds with the collective interests. Whether to exert social control in preventing deviant behaviors can be interpreted as a choice one has to make in a social dilemma situation. By adjusting our understanding of the nature of informal social control and taking advantage of the insights produced by game theorists exploring social dilemmas, we are able to provide theoretical support and justification to make sense of the variation in the strength of informal social control.

THEORETICAL FRAMEWORK

INFORMAL SOCIAL CONTROL IN SOCIAL DISORGANIZATION THEORY

The contemporary neighborhood-level crime study draws heavily on social disorganization theory which was developed by Shaw and McKay (1942) to explain spatial variation in crime rates within urban areas. Social disorganization theory is also known as “the aggregate level control theory of crime”, which means that it is the absence of social control, not the presence of criminal motives that produces high crime rates.

Kornhauser (1978), for example, pointed out that the causal mechanism underlain in social disorganization theory is a pure control mode. The source of neighborhood-level crime rates does not lie in rival value systems that motivate local people toward criminal offending, but

rather in the various strength of conventional organizations and their consequential ability to provide informal social control (Warner, 2003). Later, Bursik (1988) echoes Kornhauser's "pure control model" argument, stating that the main point of Shaw and McKay's framework is that "the dynamics of social disorganization lead to variations across neighborhood in the strength of the commitment of residents to group standards." Thus, the attenuation of this commitment and the breakdown of the consequential social control behavior reduce the costs associated with deviant behaviors within the group, thereby allowing high rates of crime and delinquency to occur.

Being a control theory of crime, social disorganization theory implies that crime will occur unless prevented by positive social mechanisms. It assumes that criminal or antisocial motive is equally distributed in society, and therefore, it is not the task of social disorganization theory to explain this motive. Rather, the major issues of the research within the social disorganization tradition are first to test whether the breakdown of social control really allows for high crime rates, and then, if the correlation is supported by scientific evidence, to investigate the causes for the variation in the strength of social control in local communities. In other words, if criminal motivation is already taken for granted in social disorganization theory, the motive or reason for people to impose social control should not be. Otherwise, there will be nothing to explain.

Actually, a large number of empirical studies have already established the validity of the causal dynamics where informal social control intervenes between structural disadvantages of neighborhoods and the level of crime and delinquency (e.g. Sampson and Groves, 1989). Consensus has emerged that the strength of informal social control is critical in achieving low crime rates. Accordingly, the logical next step for neighborhood-level research of crime is to

explore what causes the variation in the strength of informal social control. The answer to this question can be found in a considerable number of neighborhood-level studies. According to them, the sources of informal social control involve various neighborhood contextual factors such as social ties and social networks (e.g. Bursik and Grasmick, 1993; Bursik, 1988; Sampson, 1987), social cohesion (e.g. Sampson et al., 1997), neighborhood attachment (e.g. Sampson and Groves, 1989; Logan and Molotch, 1987; Woldoff, 2002), cultural organization (e.g. Sampson and Jeglum-Bartusch, 1998; Warner, 2003), satisfaction with police (e.g. Silver and Miller, 2004), and crime and disorder (e.g. Liska and Warner, 1991; Sampson et al., 1997). Recently, Silver and Miller (2004) combined most of these factors into one research design and found that neighborhood attachment and satisfaction with police had direct effects on the strength of informal social control.

Despite the impressive research findings, a major downside of these studies has to be pointed out. That is, the research to-date has largely been driven by the availability of data and has focused on the identification of risk factors, thereby lacking the theoretical discussion of the underlying mechanisms that account for the variation in the strength of informal social control. In other words, the determination of which indicator should be put into the causal model for interpreting informal social control is largely based on empirical knowledge, but not on a well-developed theory. For example, in one study of Warner (2003) asserting that culture attenuation inhibit informal social control, she does not make a very adequate theoretical argument about why cultural strength should be taken into consideration. She basically argues that the shared norm is important, because without it, people are unlikely to behave in line with it. For another example, Sampson and the colleagues (1997), in one empirical study, combine mutual trust and informal social control (i.e. the willingness to intervene) as the measure of a new concept

“collective efficacy” which intervenes between the concentrated disadvantages and violent crime. However, when justifying the measure, they simply point out “indeed, one is unlikely to intervene in a neighborhood context in which the rules are unclear and people mistrust or fear one another” (Sampson et al., 1997: 919). Apparently, making a link between these two factors is not theoretically oriented, but depends heavily on the result of factor analysis. In short, due to the weak theoretical foundation, the selection of indicators in prior studies is scattered, and also, there is little discussion of the inherent relationship among those factors. Thus, an empirical study guided by a well-stated theoretical framework concerning informal social control is needed.

Before exploring a proper theory for explaining neighborhood-level informal social control, a clear definition of the concept has to be provided in advance. Fundamentally, the concept of social control has its meaning in two dimensions. In the broad sense, social control refers to all human activities and arrangements that contribute to social order and, particularly, that influence people to conform (Black, 1984; Clark and Gibbs, 1965). However, because the broad conception is too inclusive and calling (Clark and Gibbs, 1965) and is extremely hard to empirically measure, criminologists now tend to adopt the narrow definition. The narrow definition of social control links social control to deviance by referring to people’s response to deviance. “In this sense, social control is present whenever and wherever people express grievances against their fellows” (Black, 1984: 5). It counteracts the negative effects deviance brings to the social system and enforces conformity (Black, 1984; Homans, 1950). It is “a social process whereby people conform to social norms or rules because they are rewarded with status, prestige, money, and freedom when they do adhere to them and are punished with loss of them when they do not” (Liska, 1997: 40). In this sense, social control is coerced or enforced (Liska, 1997), primarily through the process of punishment.

According to the narrow school of thought that views social control as a response to deviance, informal social control – one key element in social disorganization theory – can be conceptualized as the willingness of residents to intervene in activities aimed at preventing deviant behavior and achieving public order in the local areas (Silver and Miller, 2004). This definition has been widely adopted in recent neighborhood-level crime studies (Warner, 2007; Silver and Miller, 2004; Warner, 2003; Sampson et al. 1997). Sampson, Raudenbush, and Earls (1997), for example, view informal social control as the residents' willingness to intervene for the common good. Their view of neighborhood-level social control focuses on the informal mechanisms by which residents themselves can effectively achieve public order. It is this informal mechanism, not the formal forces (e.g. police crackdown), that explains the variation in crime rates across different urban areas.

As indicated by the definition, informal social control reflects individuals' behavioral tendencies to engage in prosocial activities, the purpose of which is to realize the common interest of their neighborhoods. In the case of neighborhood-level crime study, the common interest is specifically referred to as public safety or achieving a social environment free of crime, especially violent crime. The intervention activity takes many forms. It varies from supervision on spontaneous playing groups to participation in neighborhood watch, from intervention in preventing juvenile delinquency to confrontation of people who disturb public order. Whatever form it takes, it needs a personal contribution and it costs one's time and energy to benefit other people or the entire community. Due to the fact that social disorganization theory is an aggregate level control theory where motives for crime need no explanation, prosocial behavior or prosocial tendency does need to be explained. Therefore, the question of informal social control becomes that of why and when people act prosocially to provide a public good at their own

personal cost. Although, few studies within the social disorganization tradition directly answer this question, the study of social dilemmas developed by game theorists provides a theoretical foundation for explaining the variation in the level of prosocial action in a large group context.

THE PERSPECTIVE OF SOCIAL DILEMMA AS EXPLANATION OF COLLECTIVE ACTION

Social dilemmas are scenarios constructed by game theorists to examine individuals' decisions to cooperate with others or defect from communal responsibility in human groups. Such dilemma exists when "there is an incentive structure (payoff structure) that leads individual actors to take a course of action that produces a collectively undesirable outcome (Yamagishi, 1988: 32)". According to game theory, when dealing with common issues, every individual in a given group has two motives. One is to maximize his or her personal interest. The other is to serve the common responsibility which will benefit the individual himself or herself eventually. While everyone is better off if cooperation is the common choice, not to contribute is of the immediate interest to every single member, thus leading to the failure of collective action. As a result, everyone is worse off than if each of them make their contributions. The situations of this kind where "the individual rationality leads to the collective irrationality" is known as social dilemmas (Kollock, 1998).

The simplest presentation of social dilemmas is the two-person prisoner's dilemma game (the PD game). In this metaphor game, theorists generate a scenario in which two prisoners who jointly committed a crime were separately given the choice between confessing (defect) or keeping silent (cooperation) (e.g. see Dawes, 1980; Kollock, 1998). Both of the players are

informed with the rule of the game¹ according to which both should keep silent in order to get the ideal result for their common interests. However, because of the uncertainty about the other's choice the rational player will chose to testify against one another which renders an outcome that is worse off if both of them keep silent. The payoff structure of the two-person PD game is illustrated in Table 1.

Table 1: The Payoff Structure of the Two-Person Prisoner's Dilemma.

	B – Keeping Silent (Cooperate)	B – Confessing (Defect)
A – Keeping Silent (Cooperate)	Both serve six months	Prisoner A serves ten years Prisoner B goes free
A – Confessing (Defect)	Prisoner A goes free Prisoner B serves ten years	Both serve two years

Since its discovery, the two-person PD game, with its simple representation of the tension between individual self-interest and collective interest, has been applied to countless large-group situations involving mixed motives (Richards, 2001). A famous example of the large group social dilemmas is known as the problem of “Provision of Public Good”. In such situation, individual is confronted with an immediate cost that produces a benefit (i.e. public good) that is shared by all in his group. As individuals, we have incentives to avoid our personal cost, but if all do so each is worse off than if we had managed to overcome the short-sighted concern (Kollock, 1998). For instance, a donation is required for maintaining certain public service. As individuals, we are each better off when we enjoy the service without donating and only take advantages of others' contributions, but if every person decides to do so, the public good will no longer be provided due to lack of funding sources.

¹ If both players cooperate, they each serve only six months in jail; if both defect, each of them gets a punishment of two-year prison time; if one cooperates and the other defects, the one who defects goes free, and the one who cooperates gets more severe punishment of ten-year prison time. For the individual player, the order of benefit that results from each combination of choices is $DC > CC > DD > CD$, where D denotes defection and C denotes cooperation (Kollock, 1998).

Despite the specific types², two fundamental properties concerning the payoff structure are required for a situation to be a social dilemma. First, each member in the group receives a higher payoff for a socially defecting non-cooperative choice no matter what other people in the group do. Second, all members in the group are better off if all, or most, people choose to cooperate than if all or most choose not to cooperate (Dawes, 1980; Van Vugt et al., 2000). The first feature of the payoff structure indicates why the mutual interest is usually overcome by the divergent self-centered concerns of each person. The second feature, on the other hand, implies that achieving collective action is possible because individuals are aware of that they will benefit from collective interest eventually. Due to the fact that individuals are assumed rational and prone maximizing their personal gain, the research question posed by the study of social dilemmas is how to achieve the collectively desirable behavior examples of which include donation, participation in labor union, paying tax, saving energy, and so on.

Exerting social control by residents in preventing deviant behavior is also one form of collectively desirable behavior, thus containing a social dilemma where the common interest of maintaining public order usually surrenders to the divergent interests of each resident to stay away from trouble. Actually, participation in informal social control activities can be interpreted as a situation that resembles “Public Good Dilemma” for the following reasons.

First, the incentive structure (shown in Table 2) presented in neighborhood-level collective actions is similar to that in public good dilemmas. On one hand, a safe neighborhood is in the interest of each resident living in the area. People desire social order, clean environment, and most importantly, a residential area free from violent crime. Just like any public service that

² Depending on the specific feature of incentive structure, there is the other type of social dilemma known as the “tragedy of the commons” where “the individual is tempted with an immediate benefit that produces a cost shared by all members in the group. If all surrender to the temptation, the outcome is a collective disaster” (Kollock, 1998: 188). An example for this type of dilemmas is preservation of natural resource.

will benefit every member in the group, public order is the common interest that each resident in the neighborhood desires to achieve. Engaging in activities that intend to supervise teenagers, stop crimes, and preserve ordered physical or social environment are expected to reduce crime rates. On the other hand, participation in those activities costs individuals' time and energy, sometimes, in extreme cases, puts one's life in danger. Thus, an individual resident is concerned with the cost he must pay for providing or maintaining the common good, which constrains his willingness to participate in this kind of socially desirable behavior. As individual, it is rational to avoid any personal cost and stay away from potential trouble; however, if every resident refrains from the mutual responsibility of maintaining public order, crime rates will possibly increase.

Table 2: The Payoff Structure of Participation in Informal Social Control.

	Others – Intervene	Others – Do nothing
Individual – Intervene	Public safety	Cost to oneself Contribute to public good a little
Individual – Do nothing	No cost to the individual himself Benefit from others contribution	High levels of crime, delinquency, and disorder

Second, the crime-free environment maintained by informal social control activities is one form of public good. According to Olson (1965), a public good, by definition, is a resource that, once provided, will benefit all members. No one in the group can be kept from consuming it, regardless whether he or she helps to provide it. In this sense, a public good is non-excludable. Moreover, the enjoyment of public good is non-rival. One member's consumption of public good will not reduce another one's benefit. In other words, a public good can be enjoyed by any number of members; the marginal cost for each additional consumer is 0 (Heckathorn, 1996). For example, one can enjoy public television whether or not he/she contributes any money and

adding one more observer will not diminish its availability to other observers. Obviously, public safety has the property of both non-excludability and non-rivalry. All residents in their neighborhood can enjoy the safe atmosphere maintained by whoever is engaging in crime prevention activities, regardless of their own participation and one resident's enjoyment would not add cost to others.

Since a public good is equally likely to be consumed by every group member, two concerns become critical in terms of whether one decides to pay his own share of responsibility. They are the temptation of being a free-rider and the unwillingness of being a sucker. Both lead to defection in public good dilemmas. Free-riding refers to the behavior of enjoying the public good without contributing to its generation or preservation (Kollock, 1998). It simply comes from the greed of individual to achieve the best interest for himself. However, if all are free-riders, the public good can no longer be provided or maintained. In the case of neighborhood order maintenance, residents are tempted to take advantages of other people's participation in crime prevention activities, but if everyone decides to free-ride, the informal social control mechanisms break down.

Other than free-riding temptation, fear of being a sucker also leads to the failure of participation in prosocial behavior. In some incidents, one may be willing to cooperate in promoting collective interest, but fears that not enough others will do similarly and, therefore, the public good will not be provided (Kollock, 1998). This concern is termed as "fear of being a sucker". Some theorists contribute the defection in social dilemmas more to the fear of being a sucker than to free-riding. For example, Klandermans (1988) argues that participants in collective action tend to believe they can make a difference through their own participation. Thus, when individuals expect that their contribution is negligible, they tend to constrain their

cooperative behavior. Again, take informal social control activity for example. Residents might be willing to stop teenagers from graffiti, but perceive that only his effort will not change the already deteriorated physical environment of his neighborhood, thus giving up the effort.

Due to the two concerns stated above, collective interests will not automatically lead to collective action in a public good dilemma situation. However, in reality we do observe that many people in contemporary society offer to help promote the interests of others and the society by doing volunteer work, by donating, by supporting health care programs for the poor (Van Vugt et al., 2000), and by participating in crime prevention effort. What leads people to overcome the divergent individual concerns and to take part in collectively desirable activities? To answer this question, game theorists have explored “solutions to social dilemmas” which are the factors that promote cooperation in social dilemmas. The next section of the paper introduces the major solutions to social dilemmas and discusses their implications to the study of neighborhood-level informal social control.

SOLUTIONS TO SOCIAL DILEMMAS AND THE IMPLICATIONS TO THE STUDY OF INFORMAL SOCIAL CONTROL

Payoff Structure (Cost & Benefit)

Most critical to social dilemmas is the payoff structure that defines the benefit and the cost associated with the behavioral choice toward cooperation or defection. Because individuals are assumed rational, it is logical to believe that high payoff and low cost for the cooperative choice produce more collective action. A large number of studies have been conducted assessing the influence of different payoff structures on prosocial behavior. As expected, results from those studies demonstrate that the greater the personal return from cooperation and the lower return

from defecting, the higher the levels of cooperation (Isaac and Walker, 1988; Isaac, Walker, and Thomas, 1984; Komorita, Sweeney, and Kravitz, 1980; Bonacich et al., 1976; Kelley and Grzelak, 1972). To the contrary, the greater the cost for cooperation and the higher return from defecting, the lower the levels of cooperation.

Being one form of cooperative action, residents' participation in informal social control is also affected by the incentive structures. Before making a decision of whether to participate in activities designed to thwart deviant behavior, the actor will consider the possible cost to themselves. Whether and to what extent the intervention will bring about the danger to the actor himself is the major cost that the actor will take into account. Usually, when crime rate is high and criminal activity is visible to residents, they tend to perceive their neighborhood as a danger place and believe that their intervention in any suspicious behavior may put them in trouble. Accordingly, the observed levels of crime and delinquency in neighborhoods are likely to constrain residents' willingness to intervene.

In fact, it is commonly believed that crime is not only consequence of the variable strength of informal social control, but also may influence resident's responding behavior. Numerous studies have discussed the consequence of observed crime and the perceived risk on residents' behavioral outcomes (e.g. Bellair, 2000; Liska and Warner, 1991; Skogan, 1986). In general, the common conclusion drawn from those studies is that fear of crime and perceived risk constrain people's willingness to actively engage in social affairs, including intervention behaviors, in particular those involving direct confrontation. Skogan (1986) summarizes different perspectives in explaining why perceived risk inhibits intervention behavior. Among them, a rational-cognitive model is consistent with the theoretical framework of social dilemmas. The model suggests that people are motivated to act by a desire to lower their risk of suffering

damaging consequences and choose a behavioral response that they think is likely to work.

According to Skogan (1986), the rational-cognitive model is a powerful model in explaining crime prevention behavior.

Reciprocity

In the study of the solutions to the two-person dilemma game, Shubik (1970) suggested that the likelihood of cooperation would increase just by repeating the games. Shubik came to this conclusion by simulating the condition of the two-person PD game in a mathematical model. Mathematically, the calculation showed how the final payoff for each player became conditional in multiple games and how individuals adjusted their choice by every outcome. Theoretically, one reason for repeated interaction to resolve the dilemma is that the reciprocity produces long term thinking and constrains the temptation of free riding. As pointed out by Axelrod (1984), reciprocity is a requirement for the emergence of cooperation in the two-person dilemmas. If players met only once, non-cooperation would be the dominating strategy, because any defecting or free-riding behavior would not have any further consequence. If the players had to interact with each other over and over again, they would, to some extent, consider the long term collective interest, as well as the consequence of defecting choice. Accordingly, players' involving in ongoing relationship helps conquer free riding problem and enhance cooperation.

Reciprocity is also crucial for eliciting collective action in large group situation. When the group membership is stable and when the repeated interaction is taking place, individuals are more likely to realize how personal contribution adds to group interest and have chance to observe others' behavior, which helps to shape the agreement of cooperation that says "if you cooperate, then I will too"(Heckathorn, 1996). Moreover, being a member in an ongoing

relationship, individuals will consider the negative consequence of non-cooperation. Afraid of being isolated from other group members, individuals tend to be more cooperative. Similarly, in the neighborhood context, it is reasonable to expect that residential stability facilitates collective efficacy of residents to act toward common interest in maintaining public order, because the residentially stable neighborhood provides an environment where residents involve in ongoing social relationship and where individuals can make their behavioral choice based on the reciprocity.

Mutual Trust

As previously discussed, fear of being a sucker is one major reason leading to the failure of collective action. Thus, game theorists suggest that when players trust each other and when they are sure that there will be enough people to take the mutual responsibility, the social dilemmas will be solved. Actually, since its inception, the prisoner's dilemma has been viewed as a problem of the mutual trust (Wolff, 1962; Thompson, 1964; Held, 1966). Economists, through modeling the payoff matrix, argue that there is no reason for defection if the players have confidence in one another, because they acknowledge that they both will benefit from the cooperation. Thus, mutual trust is the key to the dilemma. However, some researchers have raised the question that while mutual trust can eliminate individuals' fear of being a sucker, but at the same time, it will reinforce the problem of free riding. This argument make perfect sense when we assume the players are completely egoistic individuals who are never concerned about the joint benefit in the long run and when they only take part in a single game. However, in reality the extremely self-centered individuals are rare; most people do give some weight to the interest of others, at least to the common interest from which they themselves will benefit

(Kollock, 1998). Moreover, individuals in social groups are experiencing ongoing social relationships. Therefore, even a self-centered person is likely to constrain their extremely selfish behavior because of the fear of punishment from others in the future interaction (Pruitt and Kimmel, 1977). In other words, taking advantage of the trust given by others will ultimately damage one's individual interest in the long run. Thus, cooperative behavior usually results from long-term thinking which is also designed to maintain continued mutual cooperation (Pruitt and Kimmel, 1977).

In terms of the study of informal social control at the neighborhood level, mutual trust is not only theoretically thought to be a critical factor in promoting residents' willingness to intervene, but also statistically indistinguishable from the measure of informal social control. According to Sampson et al. (1997), the measure of informal social control and the measure of social cohesion are highly correlated with one another, thus they can be combined to measure "collective efficacy" which illustrates the capability of local communities to act toward the common good and to achieve collective goals.

Communication

Implicit in the nature of the PD game, another critical factor in deriving a solution to the social dilemma is face-to-face communication. According to a wide variety of studies, when individuals are allowed to talk with each other, cooperation rates increase significantly (Kollock, 1998; Orbell et al., 1990; Orbell et al., 1988; Liebrand, 1984; Edney and Harper, 1978; Dawes et al., 1977; Jerdee and Rosen, 1974; Jorgenson and Papciak, 1981; Brecher, 1977). Messick and Brewer (1983) suggested four possible reasons to explain the positive association between interpersonal communication and the level of cooperation. First, communication may enable

individuals to judge what others will do in the social dilemma situation. The judgment provides a basis for one to make his own choice. Second, by communicating with each other, actors gain an opportunity to make commitments about their own behavior and to elicit others' commitment correspondingly. The third aspect is related to the morally persuasive power of communication. Communication may pressure group members to agree on the standard of what is right and what is wrong. Finally, communication may also reinforce a sense of group identity which is critical for eliciting group-driven behavior (Dawes, 1991). In short, communication produces higher cooperation rates by giving group members an opportunity to understand and discuss their common problem, by strengthening commitment and group identity, and by providing information about how others will perform in the current situation.

While communication, in general, does increase cooperation rates, it is important to note that this facilitating effect might be absent when the communication is irrelevant to the common issue at hand or suggests that other group members are not concerned with contributing to the collective interests. One study conducted by Dawes and the colleagues (1977) on the commons dilemma situation found that defecting choice was significantly higher in the no-communication and irrelevant-communication conditions than relevant-communication conditions. In addition, no significant difference was found between no-communication and irrelevant-communication in terms of cooperation rates.

The study of how communication facilitates collective action in social dilemmas also has implication on the current research on informal social control. We expect that frequent social interaction will lead to a higher level of informal social control when such interaction is good for clarifying the common goal of realizing social order and fortifying group members' confidence about others.

Intimacy

From a social psychological perspective, the relationship between the actor and the coactors may have behavioral effects over the characteristics of those involved in the social dilemma and the characteristics of the social dilemma itself (Schroeder, Sibicky, and Irwin, 1995). We use “intimacy” to label the closeness of and affiliation involved in this relationship among group members. If individuals perceive their partners socially close to them, a sense of affiliation may develop and this sense of affiliation may be “accompanied by a shift of focus from self-concern to concern for the group and the well-being of other coactors” (Schroeder, Sibicky, and Irwin, 1995:190).

How intimate the relationship is among residents in local neighborhoods can be measured by the intensity of friendship and kinship ties. According to systemic model, neighborhood is a complex system of friendship and kinship network rooted in the ongoing social relationship (Kasarda and Janowitz, 1974). The stronger the social ties are, the more residents identify their neighbors as socially close to them and the greater cooperation might be found.

Group Identity

One another factor that game theorists suggest to be capable of increasing cooperation in social dilemmas is group identity. Actually, researchers in many different disciplines such as biosociology have long recognized that individuals usually favor in-group members over out-group members and those not identified as in-group members (Penner et al., 2005). Similarly, in social dilemma situations, the extent to which one identifies the existence of the group boundary and recognizes himself as a group member exhibits great influence on subsequent behavior. Specifically, the more an individual identifies the boundary of the group he is subject to and the

more he perceives the goals and norms common to the group, the higher the rates of cooperation. Research has found that the effect of group identity is so powerful that it can affect cooperation rates even in the absence of communication (Kollock, 1998). One possible explanation why individuals are more willing to cooperate if they are identified or identify others as ingroup members is that a collective social identity increases the altruistic attitude of the member (Kollock, 1998).

Actually, the two factors – intimacy and group identity – are hardly distinguishable. Both of them represent the sense of belongingness. The subtle difference may be that group identity can take effect even if there is no close relationship among group members. Randomly assigning individuals into different groups or recategorizing existing groups can also affect cooperation rates within each group (Gaertner et al., 2000).

In the current study, we expect that, neighborhood identity is another factor that contributes to the realization of informal social control. Indeed, neighborhoods differentiate in the level of their group identity. In some residential areas, residents view their neighborhoods as groups that they are willing to make investment in, while in others, population is undergoing turnover and residents, though engaging in community life, are “prepared to leave their communities if local conditions fail to satisfy their immediate needs or aspirations” (Janowitz, 1951:329). Accordingly, residential stability may have great influence on neighborhood identity. In stable neighborhood, residents are more likely to be part of collective life and have the sense of community.

Expectation

According to social psychology, people are subject to social influence where others' behaviors shape their own. Other members' behaviors usually provide a guide for making one's own behavioral choice in social dilemma situation (Latane and Nida, 1981). First of all, many dilemma situations are ambiguous; actors will use any available information to help them define the situation so that they can determine which choice of action will best meet their needs (Schroeder et al., 1995). Furthermore, others' choice directly affects one's own payoff, by increasing or reducing the cost or benefit associated with cooperation (Kanouse and Wiest, 1967). If information shows that other group members are unlikely to take cooperative action, fear of being a sucker will dissuade the actor from contributing. On the other hand, if cooperation is expected to be a common choice, the individuals will be more positive on making their own contribution since their participation is likely to make difference with others' assistance. In short, people, most of time, cooperate when their partners do, because they believe together they can make a difference and conquer the collective objective. Thus, the positive expectation of others' activities promotes cooperation by eliminating the fear of being a sucker.

In the current study, we will hypothesize that the extent to which residents expect their neighbors will conform to conventional social norms is related to the variation in the strength of informal social control. In other words, the level of informal social control varies depending on the extent to which the conventional values are believed to be shared in the community. The reason why the expectation of norm being shared is important in eliciting informal social control behavior is that the purpose of informal social control is to maintain social norms; the perception of few people abiding by social norms is followed by the expectation that no enough others will make their contribution to uphold those norms, in other words, to participate in informal social

control behavior. Therefore, this expectation discourages the actor to make their own contribution in maintaining social order.

Actually, criminologists have long recognized that the effectiveness of conventional norms is critical for achieving high level of informal social control. Warner (2003), for example, found that the attenuation of conventional value directly undermines residents' willingness to intervene in activities against crime. She reasons that when residents are uncertain of the extent to which neighbors share conventional values, there is no "clear sense of support for demanding behavior in line with those value" (Warner, 2003: 76). Warner (2003) used the term "cultural strength" to refer to the effectiveness of conventional norms. Actually, "culture" is not a magic word, nor an intangible concept that cannot be measured. In the study of social dilemmas, culture is nothing but assumed behavioral consensus (Penner et al., 2005). It is the extent to which people assume others will abide by common behavioral rules. If others seem not to care about conventional norms, people tend to be lax in enforcing those norms in the absence of reciprocity (Kollock, 1998).

THE STUDY

The purpose of the current study is to investigate whether the solutions to social dilemmas developed by game theorists are applicable to the explanation of the variation in neighborhood-level informal social control. Overall, those solutions identified in the previous section include low cost to cooperation, reciprocity, mutual trust, communication, intimacy, group identity, and expectation. Clearly, the next critical step for the current study is to measure those factors in the neighborhood context using available data sources.

DATA SOURCES AND SAMPLING STRATEGIES

The data used in the analysis is from the survey entitled as “Informal Social Control of Crime in High Drug Use Neighborhood in Louisville and Lexington, Kentucky, 2000”, which is one part of a National Institute of Justice-founded study examining informal social control in high drug-use neighborhood. The data were gathered from 2,309 respondents 18 years of age or older, currently residing at the randomly sampled addresses in 66 neighborhoods within the two cities. The unit of analysis is the census-defined block groups (neighborhoods) that are relatively small and appropriate for the examination of neighborhood dynamics (Warner, 2007).

A stratified sampling method was applied. 66 neighborhoods (census-defined blocks) were first sampled; then the “street guide” section of city directories was used to create a sampling frame of all addresses in the neighborhoods. Households were then sampled using systematic random sampling. Each sampled household was mailed a letter explaining the purpose of the study and stating that the household might be contacted to participate in the study. At this point, households with phones were separated from the households without phones. Households with telephone numbers were interviewed over the phone, whereas household

without telephones were interviewed with face-to-face survey. Within each household, the person who most recently had a birthday and who was at least 18 years of age was interviewed. The overall response rate was 60%³.

The survey data were supplemented with block group-level data from the 2000 U.S. Census, which provided information on population counts, demographic structure of population, poverty indexes, and unemployment rates, etc.

MEASURES OF VARIABLES

As discussed previously, each general solution to social dilemmas can be interpreted as a specific factor thought to facilitate neighborhood-level informal social control.

Collective Action - Informal Social Control

Informal social control is the dependent variable in the current study. It is defined as the willingness of residents to intervene in activities aimed at preventing deviant behavior and achieving public order in the local areas. Accordingly, it can be measured by the likelihood of residents to take action against crime, delinquency, and youth misbehavior. Because there is no way to assess the objective level of informal social control in a neighborhood, criminologists usually use residents' perceived likelihood of their neighbor intervening in activities against deviant behavior to reflect the objective level of informal social control (Silver and Miller, 2004;

³ The response rate is based on the percent of eligible respondents contacted. Cases of unknown eligibility (busy signals, disconnects, no answers) and ineligibility (no longer living at that address) were excluded from this calculation as defined by the American Association for Public Opinion Research (1998). For telephone interviews, attempts with no answers were tried at least 20 times and some were tried as many as 30 times. Disconnects were treated as temporary and retried after 2 weeks. For face-to-face interviews, interviewers made up to five attempts to find someone at home.

Noticing that the response rate is low (60%), we checked the distributions of several variables related to demographic features (e.g. gender, race, occupation, etc.) of respondents and found that the distributions are consistent with those provided by census data, which indicates that the sample is not biased on those features.

Warner, 2003; Sampson et al., 1997). The current study also adopts this global measure of neighborhood-level informal social control. We combined six Likert-scale items to measure the willingness to intervene. Residents were asked about the likelihood that their neighbors would intervene if:

- children were spray painting graffiti on a local building;
- children were showing disrespect to an adult in your neighborhood;
- a fight broke out in front of your house in plain sight;
- someone were breaking into your house in plain sight;
- someone were trying to sell drugs to an adult in plain sight;
- someone were trying to sell drugs to a neighborhood child in plain sight.

In the original dataset, the coding for the likelihood scale is “1=very likely, 2=somewhat likely, 3=somewhat unlikely, and 4=very unlikely.” We reversed the coding for the larger number to represent the higher level of informal social control. Each respondent’s responses were averaged across the items. Averages were calculated as long as respondents had valid responses to at least four items. Cronbach’s alpha for this scale is .82.

Cost to Cooperation – Observed Levels of Crime and Delinquency

As discussed in the previous section, variable payoff structures lead to different cooperation rates, which implies that the benefit and cost associated with intervention behavior would have influence on the strength of informal social control. Accordingly, we expect that the observed level of crime and delinquency may directly constrain residents’ willingness to intervene by increasing the potential cost associated with the intervention behavior. In the analysis, we use the drug arrest rate in 1999 to measure the observed level of crime and

delinquency. There are three justifications of this measure. First, the survey oversampled high drug activity neighborhoods. Thus drug activity may be the most popular type of crime that residents would observe in their everyday life. Second, drug activity is highly related to violence and may arouse fear of reprisal for intervening. Third, the actual level of drug activity is difficult to assess. Therefore, we have to use drug arrest rate as the measure. Specifically, drug arrest rates were calculated by dividing the total number of drug arrests in 1999 by the 2000 U.S. Census neighborhood population counts and multiplying by 1,000. Because the distribution of the rates is highly skewed, we use the logged drug arrest rates as the final measure.

Reciprocity – Residential Stability

The next independent variable in the analysis is reciprocity. In the neighborhood context, reciprocity can be measured by residential stability. Stable neighborhoods ensure the continuous social interaction and provide for the residents the information about what other people did or will do when they are confronted with common issues, thus, leading to high level of collective action. In the following analysis, we use the length of residence to measure residential stability. Respondents were asked about how long they have been living in the current address and the answers were aggregated to the neighborhood level. Specifically, residential stability is measured by the percentage of residents who live in the same house more than 5 years.

Intimacy – Local Friendship and Kinship Ties

Local friendship and kinship ties show how residents feel their neighbors are socially close to them. The closer they feel attached to other group members, the more altruistic attitude they may hold. The item used to measure this construct is the average number of neighbors who

are respondents' relatives and who respondents consider as friends. Noticing that there are several extremely large values with each of the two items (e.g. one has 1,000 friends in his neighborhood), I truncated those values before combining them to measure the local friendship and kinship ties.

Group Identity – Neighborhood Identity

Another factor that might play an important role in achieving high level of informal social control is the group identity of a neighborhood (i.e. neighborhood identity). If residents are better integrated to their neighborhood and recognize their neighborhood as a group, they are more likely to participate in activities intended to promote the neighborhood's common interest. According to social dilemma perspective, how individuals identify themselves as group members, identify others as group members, recognize group boundary, and have "sense of community" are all aspects of group identity. In the current study, we use the proportion of residents who said their neighborhood had a name to measure the group identity of a neighborhood.

Communication – Social Interaction

Social interaction entails how frequently group members communicate and interact with each other. Usually, communication leads to more cooperation, but the content should be related to the collective task at hand. In the survey, the respondents are asked about how often they:

- ask someone from the neighborhood over to their house or go to the neighbor's house for a meal, to play cards, watch TV, or talk;
- borrow or exchange things with neighbors such as food, recipes or tools;
- ask a neighbor for help;

- go out for an evening with someone from the neighborhood to a movie, sports event, for a drink, etc;
- talk to someone in the neighborhood about personal problems;

The answers to the five questions are aggregated to the neighborhood level as the proportion of respondents who interact with their neighbors in the five previous ways at least once a month. Then, the five items are combined to measure social interaction. Cronbach's alpha for this scale is .81.

Expectation – Normative Expectation

Normative expectation refers to the extent to which residents believe that their neighbors abide by conventional norms. Only when people are holding such belief, they will expect that their neighbors are willing to promote conventional norms, which, essentially, elicits informal social control behavior. In the current study, normative expectation is measured by the proportion of respondents who think that their neighbors would “strongly agree” with the first five statements and “strongly disagree” with the last two statements of the following conventional values:

- it is important to be honest;
- family members should make sacrifices;
- it is wrong to get drunk;
- selling drugs is always wrong;
- it is wrong for young women to get pregnant before marriage;
- it is ok to use marijuana;
- it is ok to use cocaine, crack, and heroin.

Cronbach's alpha for the scale is .87.

Neighborhood Structural Characteristics

In addition to those factors implied from social dilemma perspective as indicators for informal social control, we also have to include neighborhood structural characteristics as exogenous variables in the analytic model. Structural characteristics of a neighborhood have been consistently found to be influential on most social mechanisms in neighborhood context (e.g. Sampson and Groves, 1989). More specifically, those characteristics involve the measure of neighborhood concentrated disadvantage, immigrant concentration, and residential dynamics (Sampson et al., 1997).

Among them, neighborhood concentrated disadvantage represents low socioeconomic status in racially segregated urban neighborhood. Accordingly, it can be measured by a set of variables related to economic, educational, occupational, and racial features of a neighborhood. In the current dataset, those SES-related variables include percentage of household below poverty line, percentage of unemployed residents in the civilian labor force, percentage of residents less than high school education, percentage of female-headed household with children under the age of 18, and percentage of African-American residents. In order to determine whether these variables are really tapping a same construct, we factor-analyzed them. The principle component analysis produced only one factor with eigenvalues greater than one. All the five variables loaded on the disadvantage factor and their factor loading were percent below poverty line (.85), percent unemployment (.87), percent with less than a high school degree (.86), percent female-headed household with children under the age of 18 (.81), and percent African-

American (.68). Hence, we combined the standardized value of these five variables as the measure of concentrated disadvantage. Cronbach's alpha for the index is .87.

The second exogenous variable frequently found in neighborhood-level studies is concentrated immigrant. It is usually measured by the percentage of Latino and foreign-born residents. In the current dataset, however, there is no measure of the percentage of foreign-born residents. Moreover, the percentage of Latino does not have enough variation to ensure the analysis⁴. Thus, we do not include concentrated immigrant as the exogenous variable.

The final neighborhood structural characteristic that usually has effect on most social mechanisms is residential stability. It is measured by the percentage of residents who have lived in the same house for more than 5 years. Note that, residential stability, as previously discussed, is also a factor hypothesized to promote informal social control. Thus, the relationship between residential stability and the dependant variable could be both direct and indirect.

Accordingly, two exogenous variables were created for the current study. *Concentrated disadvantage* is measured by the combination of the five items listed above (See Table 3) and *residential stability* is measured by the percentage of residents who live in the current address more than 5 years which is consistent with the measure of reciprocity.

Overall, in the current analytic model, there are seven neighborhood-level independent variables hypothesized to explain informal social control. They are concentrated disadvantage, residential stability, drug arrest rates in the previous year, local friendship and kinship ties, social interaction, neighborhood identity, and normative expectation. The first two columns in Table 3 summarize the measures of those variables.

⁴ 43 out of 66 neighborhoods do not have Latino residents and the standard deviation for percent Latino is less than 1%.

Notice that, we exclude mutual trust as an independent variable, because, technically, mutual trust and informal social control represent a same hidden mechanism⁵. In fact, mutual trust and willingness to intervene are usually combined to measure collective efficacy which refers to the ability of a group to collectively promote the common interest. Essentially, such collective ability is what the present study attempts to explain.

ANALYTIC STRATEGY

Although the current study attempts to explain neighborhood-level informal social control, the data that we use to measure this neighborhood-level phenomenon is actually individual respondents' perception. Moreover, most of the neighborhood-level independent variables are aggregated from individual level observations. Thus, the data in use has hierarchical structures with individual observations nested within neighborhoods (Raudenbush and Bryk, 2002). A major concern with nested data structure is that the relationships found among higher level variables may be due to the compositional differences between neighborhoods in the kinds of individuals they contain (Silver and Miller, 2004). Therefore, we must control for relevant respondent characteristics. Failing to do that results in biased estimation of standard errors.

In order to control for individual level characteristics of respondents, the study employs hierarchical linear modeling (HLM). The individual features that are incorporated into the analysis include gender, age, SES, and length of residence (i.e. mobility). Among them, age, SES,

⁵ Mutual trust was measured by four conceptually related items. Respondents were asked how strongly they agreed on that people in their neighborhood "can be trusted," "care about the neighborhood," "generally get along with each other," "share the same values" The answers to the four questions are aggregated to the neighborhood level as the proportion of respondents who strongly agree with those statements. Cronbach's alpha for the scale is .92. The correlation coefficient for informal social control and mutual trust is as high as .78 ($p < .001$) at the neighborhood level.

and residential mobility have been found to be related to respondents' perception of informal social control (Sampson et al., 1997; Silver and Miller, 2004; Warner, 2008).

The clustered data structure also involves a problem known as non-independence of error terms, which increases the potential for type I errors in statistical test. To correct this problem, robust standard errors were estimated using the Huber-White sandwich estimator in the HLM program (Huber, 1967; White, 1980). Accordingly, all significance tests in the current study were based on robust standard errors.

Moreover, in analysis, the individual-level variables, excluding dummy, were grand mean centered so that the effects of the level 2 variables can be directly interpreted as contextual effect (Raudenbush and Bryk, 2002).

Table 3: Measurement and descriptive statistics of variables

Variables	Measures	Mean	SD	Range
Neighborhood Level (n=66)				
Concentrated Disadvantage	The combination of 1) % below poverty 2) % African-American 3) % unemployment 4) % less than high school education 5) % female-headed household with children under the age of 18	0.00	1.00	-1.59 - 2.80
Residential Stability	% respondents living in the current address for more than 5 years	53.63	18.70	0.00 - 88.57
Logged Drug Arrest Rates	Ln[(number of drug arrests in 1999)*1000/population]	2.91	1.49	-2.30 - 5.30
Kinship and Friendship Ties	Average number of relatives and friends in the neighborhood.	7.92	2.57	3.66 - 16.83
Neighborhood Identity	Percent of respondents who said the neighborhood has a name.	61.02	24.83	5.88 - 100
Social Interaction	Average % of respondents who - 1) ask some from the neighborhood over to their house or go to their house, 2) borrow or exchange things with neighbors 3) ask a neighbor for help, 4) go out with neighbor for a variety of events 5) talk to someone in the neighborhood about personal problems at least once a month.	34.18	7.48	16.57 - 51.43
Normative Expectation	Percent of respondents who said that their neighbors would “strongly agree” with: 1) it is important to be honest; 2) family members should make sacrifices; 3) it is wrong to get drunk; 4) selling drugs is always wrong; 5) it is wrong for young women to get pregnant before marriage; and “strongly disagree” with: 1) it is ok to use marijuana; 2) it is ok to use cocaine, crack, and heroin.	57.89	10.61	40.66 - 81.61
Individual Level (n=2,271)				
Gender	Male = 1; Female = 0	0.33	0.47	0.00 - 1.00
Age	Age of the respondents	46.03	17.01	18.00 - 94.00
SES	The combination of education level, employment status, and whether it is female-headed household with children under age of 18	0.00	1.00	-2.15 - 1.54
Mobility	How many years the respondents have been living in the current neighborhood.	10.46	11.73	0.04 - 74.00
Informal social control	How likely do respondents think their neighbors would - 1) stop fight, 2) stop break-in, 3) stop sale of drug to children, 4) stop sale of drug to adults. 5) stop children from spray painting 6) stop children from showing disrespect	3.20	0.76	1.00 - 4.00

FINDINGS

The descriptive statistics for all variables are shown in Table 3. The upper portion of the table summarizes the statistics of neighborhood-level indicators. As shown in Table 3, all neighborhood-level variables (N=66) exhibit certain degree of variation across neighborhoods. The lower portion of Table 3 shows descriptive statistics of individual level variables (N=2,271). As illustrated, 33 percent of residents are male, the average age for respondents is 46 years old, and the average length that those respondents live in the neighborhood is around ten and a half years.

After examining the descriptive statistics, deleting the missing data⁶, and assuring that all variables are normally distributed, the study next turns to the examination of the variance components for the dependent variable – informal social control. To determine how informal social control varies within and between neighborhoods, we constructed the null HLM model with both individual level and neighborhood level variances.

Equation 1 (Null Model):

$$\text{Level 1: } Y_{ij} = B_{0j} + r_{ij} \qquad r_{ij} \sim N(0, \sigma^2)$$

$$\text{Level 2: } B_{0j} = \gamma_{00} + u_{0j} \qquad u_{0j} \sim N(0, \tau_{00})$$

In the null model, Y_{ij} denotes the i 's respondent's perception of informal social control in the j 's neighborhood. B_{0j} is the average value of the perceived informal social control within the

⁶ There are 38 missing data (item-missing) at the individual level. 36 are for the dependent variable, 1 for SES, and 1 for gender. Because it is only a small portion (1.6%) of the whole number of respondents and also those missing cases are almost equally distributed across neighborhoods, I deleted those missing data before analysis.

j 's neighborhood. r_{ij} is the within group random error and it is assumed normally distributed. γ_{00} represents the average level of informal social control across neighborhoods. u_{0j} is the between-neighborhood variance assumed normally distributed.

The analysis of the null model shows that the between-neighborhood variance component is .065 ($p < .001$) and the within-group variance component is .509, which means 12.7 percent of the variance in informal social control is between-neighborhood variance. This is the portion of variance that the current study attempts to explain.

Equation 2 (Simple Model):

Level 1: $Y_{ij} = B_{0j} + B_{1j}(Gender)_{ij} + B_{2j}(Age)_{ij} + B_{3j}(SES)_{ij} + B_{4j}(Mobilit)_{ij} + r_{ij}$ $r_{ij} \sim N(0, \sigma^2)$

Level 2: $B_{0j} = \gamma_{00} + u_{0j}$ $u_{0j} \sim N(0, \tau_{00})$

In order to determine how much of the between-neighborhood variance actually comes from the compositional effects, several individual-level variables were added to the null model (Equation 2). Those variables are gender, age, SES, and length of residence of individual respondents living in current address. As suggested by the analysis, the between-neighborhood variance was reduced to .049 ($p < .001$) after we added those person-level variables, which indicates that only 25 percent of the between-neighborhood variance in informal social control is due to the composition of different types of persons in different neighborhoods. The rest 75 percent of this variance can be explained by neighborhood-level factors.

The study next examines how the hypothesized neighborhood-level factors account for rest of the between-neighborhood variance in informal social control, controlling for individual level variables. As shown in Table 4, three HLM models are constructed to assess neighborhood

levels of informal social control. Model 1 is the simple model in which the Level 2 indicators only involve the two exogenous variables. Model 2 includes all hypothesized factors except normative expectation, because normative expectation might mediate the effects of crime, social ties, and social interaction on informal social control (Warner, 2003; Schroeder et al., 1995). Finally, Model 3 assesses the net effect of each hypothesized variable on neighborhood levels of informal social control.

Equation 3 (Model 1):

Level 1: $Y_{ij} = B_{0j} + B_{1j}(Gender)_{ij} + B_{2j}(Age)_{ij} + B_{3j}(SES)_{ij} + B_{4j}(Mobility)_{ij} + r_{ij} \quad r_{ij} \sim N(0, \sigma^2)$

Level 2: $B_{0j} = \gamma_{00} + \gamma_{01}(Disadvtg.)_j + \gamma_{02}(Stability)_j + u_{0j} \quad u_{0j} \sim N(0, \tau_{00})$

Model 1 in Table 4 estimates Equation 3 shown above. By adding concentrated disadvantage and residential stability to Level-2 equation, the model examines what portion of the between-neighborhood variance in informal social control is explained by the two exogenous variables in addition to the compositional effects. The results suggest that both concentrated disadvantage and residential stability are significantly related to neighborhood levels of informal social control, independent of person-level variables. The relationship between concentrated disadvantage and the dependent variable is negative, which indicates that socially disadvantaged neighborhoods tend to have low level of informal social control. Residential stability, on the other hand, has positive effect on resident’s perceived level of informal social control; the more stable a neighborhood is, the higher the level of informal social control. In short, residents are less willing to intervene in promoting safe public environment in disadvantaged and instable neighborhood. Adding the two exogenous variables explained 69% of the remaining

Table 4. Hierarchical Linear Models of Informal Social Control with Robust Standard Errors

	Model 1	Model 2	Model 3
	<i>b</i> (SE)	<i>b</i> (SE)	<i>b</i> (SE)
Intercept	3.222 (.025)***	3.220 (.023)***	3.219 (.023)***
Neighborhood Level (n=66)			
Concentrated Disadvantage	-.146 (.027)***	-.111 (.032)**	-.117 (.030)**
Residential Stability	-.005 (.001)**	-.005 (.001)**	-.004 (.001)*
Logged Drug Arrest Rate 1999		-.053 (.015)**	-.040 (.018)*
Friendship and Kinship Ties		-.016 (.008)*	-.012 (.008)
Neighborhood Identity		-.001 (.001)	-.001 (.001)
Social Interaction		-.009 (.003)**	-.010 (.003)**
Normative Expectation			-.005 (.002)*
Explained Level-2 Variance	69%	85%	88%
Individual Level (n=2,217)			
Male	-.052 (.039)	-.050 (.040)	-.046 (.040)
Age	-.004 (.001)**	-.004 (.001)**	-.004 (.001)**
SES	-.052 (.022)**	-.052 (.022)*	-.051 (.022)*
Length of Residence	-4.7E-5 (.002)	-5.0E-4 (.002)	-4.6E-4 (.002)

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

neighborhood-level variance (.049) in informal social control, controlling for the compositional effects.

Equation 4 (Model 2):

Level 1: $Y_{ij} = B_{0j} + B_{1j}(Gender)_{ij} + B_{2j}(Age)_{ij} + B_{3j}(SES)_{ij} + B_{4j}(Mobility)_{ij} + r_{ij}$ $r_{ij} \sim N(0, \sigma^2)$

Level 2: $B_{0j} = \gamma_{00} + \gamma_{01}(Disadvtg.)_j + \gamma_{02}(Stability)_j + \gamma_{03}(Ties)_j + \gamma_{04}(Identity)_j$
 $+ \gamma_{05}(Crime)_j + \gamma_{06}(Interaction)_j + u_{0j}$ $u_{0j} \sim N(0, \tau_{00})$

As demonstrated by Equation 4, Model 2 of Table 4 examines the effects of five out of the six hypothesized factors on informal social control, with normative expectation excluded temporarily. As suggested by the result, the two exogenous variables, drug activity, local friendship and kinship ties, and social interaction are significantly related to neighborhood levels of informal social control and the directions of these relationships are all consistent with our expectation.

Specifically, logged drug arrest rates in 1999 are significantly and negatively related to the strength of neighborhood-level informal social control, when controlling for other variables. This result is consistent with the hypothesis that high levels of neighborhood crime and delinquency inhibit people’s willingness to intervene in promoting public order by raising the potential cost associated with intervention behavior.

Local friendship and kinship ties are significantly and positively associated with informal social control, independent of neighborhood structural characteristics, drug activity, neighborhood identity, and social interaction, suggesting that intense social ties facilitate residents’ willingness to intervene for the public good. This result is consistent with our

hypothesis that the more people feel their neighbors are socially close to them and the better they are integrated in local communities, the more likely they will act to promote the collective interest of their neighborhoods.

Contrary to our hypothesis, neighborhood identity is not related to neighborhood-level informal social control when controlling for other factors.

As expected, another hypothesized factor in this model – social interaction – is found to significantly increase the perceived level of informal social control in neighborhoods, controlling for other variables. The result suggest that the more frequently residents communicate and interact with each other, the more willing they are to act toward neighborhood’s common interest.

By comparing Model 2 to Model 1, we found that the effect of concentrated disadvantage on informal social control was moderately reduced, which is the sign of mediation. In other words, part of the effect of neighborhood concentrated disadvantage on the outcome variable is mediated by those hypothesized social mechanism. The effect of residential stability, however, remains the same after adding drug activity, social ties, neighborhood identity, and social interaction. Model 2 increases the explained neighborhood level variance of informal social control to 85%.

Equation 5 (Model 3):

Level 1: $Y_{ij} = B_{0j} + B_{1j}(Gender)_{ij} + B_{2j}(Age)_{ij} + B_{3j}(SES)_{ij} + B_{4j}(Mobility)_{ij} + r_{ij} \quad r_{ij} \sim N(0, \sigma^2)$

Level 2: $B_{0j} = \gamma_{00} + \gamma_{01}(Disadvtg.)_j + \gamma_{02}(Stability)_j + \gamma_{03}(Ties)_j + \gamma_{04}(Identity)_j + \gamma_{05}(Crime)_j + \gamma_{06}(Interaction)_j + \gamma_{07}(Expecation)_j + u_{0j} \quad u_{0j} \sim N(0, \tau_{00})$

Model 3 is the full model of the analysis. By adding normative expectation to the equation (Equation 5), we assessed the net effect of each of the hypothesized factors on neighborhood levels of informal social control, as well as the possible mediation effect exhibited by normative expectation between other hypothesized factors and the outcome variable. The findings in Model 3 of Table 4 show that except social ties and neighborhood identity all other hypothesized variables are significantly related to the strength of informal social control. Among them, drug activity is negatively related to neighborhood levels of informal social control, indicating that controlling for all other factors, the higher the rates of drug activity, the less willing residents are to participate in informal social control action. Residential stability, social interaction and normative expectation, on the other hand, directly enhance the strength of informal social control, which is consistent with the hypotheses that reciprocity, communication, and positive expectation facilitate collective action toward common good.

Moreover, when comparing Model 3 to Model 2, we found that the effect of social ties on informal social control disappears and the effects of drug activity and residential stability were substantially reduced. This change suggests that the effects of residential stability, social ties, and drug activity on informal social control are mediated by normative expectation. Social ties only have indirect effect on neighborhood levels of informal social control. No mediation effect was found in relation to concentrated disadvantage and social interaction, after adding normative expectation to the model. The full model finally increases the explained between-neighborhood variance of informal social control to 87%.

DISCUSSION AND CONCLUSION

In the theoretical framework of social disorganization theory, informal social control has been found to be a critical mechanism that mediates the effects of structural characteristics of a neighborhood on the rates of crime and delinquency. High levels of informal social control help to achieve social order in local areas. Accordingly, a logical next step in research is to explore what contributes to the strength of informal social control. The current study has attempted to answer this question by employing game theorists' perspective on social dilemmas. Social dilemma is situation where collective action fails because the collective interest is usually overcome by individual interest. The solutions to social dilemmas (i.e. the ways to elicit cooperation), according to game theorists, include reducing cost associated with cooperation, reinforcing the process of reciprocity, enhancing the sense of belonging and group identity, fostering communication, and building positive expectation among group members. By defining informal social control as one type of collectively desirable action, we believe that those solutions to social dilemmas can also increase the level of informal social control in local neighborhoods.

In the study, we interpreted each of the solutions as one specific factor in the neighborhood context and assessed their effects on informal social control. After controlling for individual-level compositional effects and neighborhood structural characteristics, the analysis found that among the seven hypothesized factors, residential stability, the low levels of criminal activity, frequent interpersonal interaction, and positive normative expectation have direct and positive effects on residents' perceived neighborhood levels of informal social control.

The direct effect of residential stability on informal social control found in the analysis is consistent with our hypothesis that reciprocity increases cooperation rates (Shubik, 1970).

According to game theorists, only when individuals expect that they are involved in a long term relationship and will interact over and over again, they are able to realize that collective interest will benefit them eventually and, at the same time, constrain their tendency of free-riding on others' contribution. Moreover, part of the effect of residential stability on informal social control is mediated by normative expectation. In other words, in residentially stable neighborhood, residents more likely perceive that their neighbors abide by conventional norms.

The negative and direct relationship found between drug arrest rates and the strength of informal social control supports the hypothesis that the perceived cost associated with cooperation discourages individuals from contributing to the common good. As previously discussed, the cost to intervention behavior that varies from neighborhood to neighborhood is not time or energy that residents may contribute, but the possible consequence of the intervention. Therefore, in neighborhood where perceived level of criminal activity is high, residents will constrain their willingness to intervene due to the fear of reprisal. Actually, the inhibiting effect of neighborhood crime rates on informal social control was also found in many other neighborhood-level studies (Silver and Miller, 2004; Warner 2002). One concern on the validity of this causal relationship is that it is hard to determine the causal ordering between crime and informal social control. Fortunately, the measure of crime rates in our study is the drug arrest rates in 1999, one year prior to the survey, which avoids the problem of reciprocal causation. Moreover, part of the effect of criminal activity on informal social control is mediated by normative expectation, which makes perfect sense, because high levels of observed crime in a neighborhood will naturally lead to the impression that conventional norms are not commonly respected. In short, crime is not only a consequence of the absence of informal social control, but also undermines the informal crime intervention system by raising cost associated with

intervention behavior and by damaging construction of positive expectation of residents on their fellow neighbors.

The next factor found to increase informal social control in the current study is social interaction. This variable measures the frequency of residents communicating and interacting with each other. The finding is consistent with the hypothesis that communication among group members facilitates cooperation. However, because of the limitation of the data, we can not identify whether the communication among residents is related to the collective issue; therefore we are not able to determine whether the content of the communication matters in solving social dilemmas. This issue has to be addressed in future study.

Our findings also support the hypothesis that positive expectation on other group members increases collective action. Specifically, we found that when residents view their neighbors as law-abiding citizens and believe that the conventional norms are commonly respected in their neighborhoods, they are more willing to intervene informally to prevent deviant behavior.

Counter to our expectation, social ties and neighborhood identity do not have direct effects on informal social control. As previously discussed, both variables depict the sense of belongingness and the sense of community, which according to the study of social dilemma, would enhance the willingness of the group members to promote common interest. The lack of relationship between social ties and informal social control might be due to the indirect causation. As suggested by our analysis, after normative expectation was added to the model, the effect of social ties on informal social control disappeared, indicating the effect of mediation. This finding is actually consistent with the model of decision-making processes in social dilemmas developed by Schroeder and the colleagues (1995). According to this model, decision-making in social

dilemmas is a process where individuals' subjective sense of affiliation reinforces their positive expectation on other group members (Schroeder et al., 1995). That, to some extent, explains why the intensity of social ties has positive effect on normative expectation, which, in turn, increase informal social control. Moreover, as suggested by Warner (2003), the effect of "cultural strength"⁷ can be integrated into the systemic model of social disorganization which has emphasis on social ties. She argues that "social ties provide one potential avenue through which widely held conventional values can be articulated, shared, and displayed" (Warner, 2003:79). Thus, the intensity of social ties enhances residents' sense that conventional norms are commonly shared. In short, local friendship and kinship ties do promote informal social control, but through an indirect avenue.

The lack of association between neighborhood identity and informal social control casts a doubt on the hypothesis that group identity increases cooperation. However, this absence of association might be due to the measure adopted in the current study. As previously discussed, group identity refers to the extent to which individuals consider themselves as group members and identify the boundary of their group. When individuals are well integrated in their group, they would be more willing to make their contribution for the common interest. Accordingly, a good measure of group identity should capture how well group members identify their group membership. Due to the limitation of the dataset, however, the current study only measures one aspect of group identity, which is whether the neighborhood has a name, while how well residents are integrated to their neighborhood life is left unmeasured. That might explain the lack of association between group identity and informal social control in the current analysis. Silver and Miller's (2004) study of informal social control in Chicago neighborhoods actually measured

⁷ Warner (2002) introduced the concept "cultural strength" to refer to the extent to which residents perceive their neighbors to agree with conventional norms.

the concept of neighborhood attachment and they found the strong positive relationship between neighborhood attachment and residents' willingness to intervene. Therefore, we cannot reject the idea that group identity promotes collective action.

Another finding out of our expectation is that neighborhood concentrated disadvantage directly decreases the strength of informal social control; only a small part of its effect is mediated by the endogenous mechanisms (e.g. social ties, social interaction, etc.). Our theoretical framework derived from social dilemma perspective does not justify this direct association. One possible explanation might be that certain mediating mechanism is left unmeasured or not properly measured. According to relevant studies (Silver and Miller, 2004), this not-properly-measured mechanism may be again neighborhood identity. As just discussed, whether a neighborhood has a name is not an adequate measure of neighborhood identity, because it fails to capture the other important aspect of neighborhood identity, which is how individuals identify their group membership and feel attached to the group. In Silver and Miller (2004)'s study on informal social control, when the measure of neighborhood attachment is available, they found that neighborhood attachment substantially⁸ mediated the effect of concentrated disadvantage on neighborhood levels of informal social control. Actually, multi-disadvantaged neighborhoods are residentially undesirable places where residents are less likely to feel attached to; thus, residents are not likely to develop the sense of belongingness and the sense of community. As previously discussed, the more individuals identify their group membership, the more willing they are to promote the common interest. To the contrary, concentrated disadvantage inhibits the development of group identity, which, in turn, constrains residents' willingness to act toward neighborhood interest.

⁸ When neighborhood attachment was added to the simple model which only included neighborhood structural characteristics as predictors, the effect of concentrated disadvantage on informal social control disappeared.

Overall, the findings in the current study suggests that the factors for promoting cooperation developed by game theorists do have implications in the study of neighborhood-level informal social control when we define informal social control as residents' willingness to participate in activities for promoting neighborhood's common interest in crime prevention. Thus, the perspective of social dilemmas provides a theoretical support for explaining the underlying mechanism account for the variation in the strength of informal social control.

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