

CHAPTER 8

RATIONAL CHOICE RESEARCH IN CRIMINOLOGY:

A MULTI-LEVEL FRAMEWORK

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INTRODUCTION

A challenging puzzle for rational choice theory concerns the causes and control of criminal behavior. Crime is a difficult case for rational choice. Compared to market behavior, financial decisions, and corporate crime, in which institutionalized norms frame decision-making in the terms of rationality, street crimes are often characterized as irrational and sub-optimal. Street criminals are commonly portrayed by the media and a few social scientists as impulsive, unthinking, and uneducated, and their behaviors as beyond the reach of formal sanctions (e.g., Gottfredson and Hirschi 1990). Consequently, support of rational choice principles for criminal behavior would provide strong evidence for the perspective (Matsueda, Kreager, and Huizinga 2006).

Crime is an important arena for investigating rational choice for another reason: utilitarian principles, and their accompanying psychological assumptions, undergird our legal institution (e.g., Maestro 1973). This connection is rooted in writings of members of the classical school, particularly Jeremy Bentham and Cesare Beccaria. Bentham ([1789] 1948) argued that happiness is a composite of maximum pleasure and minimum pain, and that the utilitarian principle—the greatest happiness for the greatest number—underlies morals and legislation. Punishment by the state constitutes one of four sanctions—political, moral, physical, and religious—that shape pleasures and pains. Influenced by the moral philosophers of the

Enlightenment, Beccaria ([1764] 1963) assumed that criminal laws reflect the terms of a social contract between members of society and the state. Individuals receive protection of their rights to personal welfare and private property in exchange for relinquishing the freedom to violate the rights of others. The rights of individuals are protected by the state through deterrence, threatening potential transgressors with just enough punishment to outweigh the pleasures of crime. With his writings, Beccaria attempted to reform the unjust and brutal legal system of eighteenth-century Europe by developing a rational system in which laws are specified clearly and *a priori* (so individuals have full information about the consequences of their acts), judicial discretion is eliminated (so all citizens are equal in the eyes of the law), and punishments are made certain, swift, and no more severe than needed to deter the public from crime (Matsueda et al. 2006).

Because of the obvious implications for public policy, theory and research on rational choice and crime has focused primarily on the question of deterrence: Does the threat of punishment by the state deter citizens from crime (see Zimring and Hawkins 1973)? Recent research concludes that the threat of formal sanction does deter, but that the effects are modest in size and perhaps conditioned by social context (e.g., Zimring and Hawkins 1973; Nagin 1998). Less research has moved beyond deterrence to examine incentives outside the scope of formal punishment, such as psychic rewards and costs, within a rational choice theory of crime. This modest but growing literature has underscored the importance of rational choice theory for understanding and explaining criminal behavior (e.g., Clarke and Cornish 1985; Cornish and Clarke 1986).

At this time, rational choice remains an important, but still minority position in criminology. This is partly because of the historical dominance of sociologists in criminology,

many of whom continue to take a jaundiced view of rational choice theory. Such views are holdovers of old sociological debates that persist today, such as free will versus determinism, macro- versus micro-explanations, and liberal political views versus conservative individualist ideologies. Skepticism over rational choice theories of crime has diminished recently as neo-classically-trained economists and rational choice sociologists have increasingly turned their attention to the problem of crime. But, with a few notable exceptions, particularly in the policy realm, economic research has not been well-integrated into the mainstream of criminological thought.

At the same time, during the last decade, criminologists have made substantial theoretical and empirical advances in uncovering important causes of crime. Most of this research is rooted in sociological perspectives. For example, research has underscored the importance of life course transitions—such as developing a committed marriage, serving in the military, becoming a mother, and successfully entering the labor force—in altering trajectories of criminal offending (e.g., Sampson and Laub 1993; Giordano et al. 2002). Research has found that incarceration of residents undermines the strength of local communities, and that re-entry of felons into communities may also have negative consequences for both the ex-offender and the community (e.g., Western 2007; Pager 2007; Clear 2007). Sociologists have identified important dimensions of community social capital upon which residents can draw to solve local neighborhood problems, such as crime and disorder, and which help explain the effects of urban structure on community rates of crime (see Sampson, Morenoff, and Gannon-Rowley 2002). Research has also provided detailed ethnographic descriptions of inner-city gangs (e.g., Venkatesh 2000), street violence (e.g., Anderson 1999), and organized crime (e.g., Gambetta 1993). With a few

notable exceptions (e.g., Gambetta 1993), most of this research is *not explicitly* rooted in rational choice perspectives.

This chapter uses a multi-level framework to discuss advances in rational choice research on crime. Rather than providing an exhaustive review of pertinent research, I instead organize the discussion around one important theoretical issue, the integration of micro and macro levels of explanation. Thus, the underlying assumption that gives structure to the chapter is that rational choice principles offer a parsimonious micro-foundation for macro-sociological concepts and causal mechanisms. The task then, is to identify how macro-level social contexts condition micro-level processes (individual decisions), and how micro-processes, in turn, produce macro-level outcomes (social organization) (e.g., Coleman 1990).

I begin by discussing an individual-level model of rational choice, deterrence, and criminal behavior. A rich and voluminous literature has developed around the question of general deterrence—do threats of formal sanction by the legal system deter the general public from crime? I review the models and different research designs used in empirical studies, and then discuss the individual-level rational addiction model of drug use (Becker and Murphy 1988; Becker 1996). To link individual-level models to macro-sociological models, I review the micro-macro problem in sociology, and the potential utility of using a rational choice model as a micro-foundation for macro-level causal relationships. Here, I summarize Coleman's (1990) position, which emphasizes the crucial task of identifying micro-to-macro transitions.

I then use this multi-level framework to analyze two productive lines of research in criminology: (1) social capital, collective efficacy, and neighborhood controls (Sampson, Raudenbush, and Earls 1997); and (2) the protection racket of organized crime (Gambetta 1993). Theoretically, I treat these processes as examples of what Edwin Sutherland (1947) termed,

“organization against crime” and “organization in favor of crime,” as the defining features of his theory of differential social organization (see Matsueda 2006). In each instance, I stress the utility of rational choice at the individual level, the broader context which conditions individual purposive action, and the micro-to-macro transitions that lead to social organization either against or in favor of crime.

The extent to which these lines of research capitalize on a rational choice micro-foundation varies considerably. For example, collective efficacy theory has been treated as a purely macro-level process linking social disorganization, social capital, and informal social control into a macro-structural theory of crime. Therefore, I show how rational choice can provide a micro-foundation for social capital and collective efficacy, which opens new theoretical puzzles and empirical research questions. In contrast, Gambetta’s (1993) analysis of the Sicilian Mafia’s protection racket draws explicitly on a rational choice perspective to explain the origins and functioning of privatized protections. Therefore, I explicate the individual-level rational choice argument and show how it links to a macro-level system of illicit action. In the final section, I discuss avenues for future research within a multi-level framework.

INDIVIDUAL LEVEL MODEL OF CRIMINAL BEHAVIOR

Rational Choice, Deterrence, and Criminal Acts

Rational choice theories of crime are rooted in the seminal writings of Gary Becker (1968), who argues that the same principles explaining decisions by firms and members of households should also explain criminal behavior. Drawing on von Neumann and Morgenstern's (1944) expected utility theory of risky decisions under uncertainty, Becker (1968:177) specifies a simple utility function for committing crimes:

$$E(U_C) = (1 - p_c) U(R) + p_c U(R - C) \quad (1)$$

where $E(U_C)$ is the expected utility of crime, p_c is the probability of getting arrested and punished, $(1 - p_c)$ is the probability of getting away with crime, R is the return (both monetary and psychic) from crime, and C is the cost of punishment (e.g., a fine or prison sentence), and U is a utility function translating punishments and rewards to a common metric. The expected utility model assumes that individuals have complete and transitive preference orderings for all possible decision outcomes.

As von Neumann and Morgenstern (1944) famously pointed out, expected utilities can differ from expected values. For example, the expected income from crime will not differ when an increase in the probability of punishment p is compensated by an equal percentage decrease in severity of punishment, C (Becker 1968).

$$E(R) = (1 - p_c) (R) + p_c (R - C) = R - p_c C \quad (2)$$

Such a change in p_c and C , however, can change expected utility because it will alter risk. The change in expected utility depends on the individual's attitude (or taste) toward risk. If a person has a preference for risk, the utility function is convex, and an increase in p_c will reduce expected utility more than an equal increase in C (Becker 1968). Conversely, if a person is risk-averse, the

utility function is concave, and C will have a greater effect than p_c . Finally, if a person is risk-neutral, the utility function is linear, and p_c and C will have identical effects. If we ignore the role of legitimate opportunities, that is, assume the expected utility from non-crime is zero, $E(U_N) = 0$, we can specify that a crime will occur when $E(U_C) > E(U_N) = 0$, so that from equation (1), a crime will occur when the following holds:

$$U(R) > p_c U(C) \tag{3}$$

That is, when the returns to crime exceed the punishment, weighted by the probability of detection, an individual will commit a crime. The policy implication here is that by increasing the certainty and severity of punishment, the probability of crime will be reduced. Crime can also be reduced by lowering the rewards to crime—by defending public spaces through increasing surveillance, employing security guards, and using technological advances in metal detection, alarms, locks, fences, and the like. Historically, following Becker’s (1968) work, most microeconomic research on crime has focused on the policy implications of increasing the certainty and severity of punishment.

Of course, legitimate opportunities are important for criminal decisions, as most members of society obtain some utility from non-criminal activities.¹ Bueno de Mesquita and Cohen (1995) present a simple model that considers legitimate opportunities by specifying a utility function for non-criminal activity:

$$E(U_N) = p_i U(I) + (1 - p_i) U(W) \tag{4}$$

where I is income (returns to conventional activity), p_i is the probability of obtaining I (through having high social status, resources, or talent), and W is welfare or the social safety net for those who cannot obtain I (i.e., $p_i = 0$). Then, the utility function for criminal behavior becomes:

¹ With his control theory, Hirschi (1969) specified that people who are committed to non-criminal activities are less likely to deviate for fear of jeopardizing their investment.

$$E(U_C) = (1 - p_c) [U(R) + p_i U(I) + (1 - p_i) U(W)] + p_c U(R + W - C) \quad (5)$$

In other words, the utility from crime is a function of the returns to crime plus income from conventional activity (each weighted by the probability of getting away with crime), plus the returns to crime and conventional activity minus the punishment for crime (each weighted by the probability of getting caught and punished). This assumes that the criminal's booty from crime is not confiscated upon arrest. (Becker 1968). Note that when the probability of getting caught is zero ($p_c = 0$), the utility from crime is equal to the returns to crime plus the returns to non-crime. When the probability of getting caught is 1.0 ($p_c = 1$), the utility from crime is the returns to crime, plus welfare, minus the penalty.

A crime will be committed when $E(U_C) > E(U_N)$; therefore, from (4) and (5), a crime will occur when the following holds:

$$(1 - p_c) [U(R) + p_i U(I) + (1 - p_i) U(W)] + p_c U(R + W - C) > p_i U(I) + (1 - p_i) U(W) \quad (6)$$

Or, equivalently, stated in terms of the risk of punishment, crime will occur when

$$p_c < U(R) / U(C) + p_i U(I - W) \quad (7)$$

That is, crime occurs when the probability of detection is less than the ratio of the reward to the sum of the punishment plus the returns to noncriminal activity weighted by the probability of realizing those returns. From a policy point of view, the probability of crime can be altered not only through criminal justice policies that increase the certainty and severity of punishments or that change defensible space (and thereby reduce opportunities for crime), but also through policies that increase conventional alternatives to crime. For example, job training, higher education, and other programs to enhance human and social capital may reduce the attractiveness of crime by increasing p_i , the probability of obtaining a desired income from legitimate activities. Returns to conventional activity include not only income but also social status and prestige, self-

esteem, and happiness; policies that increase these quantities by inculcating strong commitments to conventional institutions may help reduce crime.

Empirical Research on Rational Choice and Deterrence

Early empirical tests of Becker's model used statistical models of aggregate crime rates, focusing on the deterrent effects of *objective* risk of punishment, using for example, risk of imprisonment (measured by imprisonment per capita) or risk of arrest (measured by arrests per crimes reported to police). Ehrlich (1973) found deterrent effects of risk of imprisonment, but scholars criticized his simultaneous equation models for using implausible solutions to the identification problem—the problem of finding good instrumental variables to identify reciprocal effects between rates of imprisonment and rates of crime—such as assuming population age, socioeconomic status, and region have zero direct effects on crime (Nagin 1978). Recent work using aggregate data includes more plausible instrumental variables to address the problem of reverse causality, and found deterrent effects. Sampson and Cohen (1988) follow the work of Wilson and Boland (1978) and use aggressive policing as an instrument for risk of arrest, finding a deterrent effect. Levitt (1997) employs the timing of mayoral elections as an instrument of number of police per capita—such elections should have a direct effect on investment in the police force (as newly-elected mayors seek to crack down on crime), but only an indirect effect on crime (but see McCrary 2003). For a review of aggregate deterrence research, see Nagin (1998) and Durlauf and Nagin 2011).

These tests of the deterrence hypothesis assume that actors know the objective certainty of arrest and imprisonment (Nagin 1998). By contrast, *subjective* expected utility models relax this assumption, replacing the single known *objective* probability with a distribution of *subjective* probabilities. Subjective utility models are still rational models because the statistical mean of

the subjective probability distribution is assumed to fall on the value of the objective probability (Nagin 1998). Empirical research from a subjective expected utility framework uses survey methods to measure perceived risk of punishment directly from respondents, rather than inferring it from behavior through the method of revealed preferences (e.g., Kahneman, Wakker, and Sarin 1997). Early empirical research by sociologists used cross-sectional data and found small deterrent effects for certainty of punishment but not for severity (e.g., Williams and Hawkins 1986). Respondents who perceive a high probability of arrest for minor offenses (like marijuana use and petty theft) report fewer acts of delinquency. Such research has been criticized for using cross-sectional data in which past delinquency is regressed on present perceived risk, resulting in the causal ordering of the variables contradicting their temporal order of measurement.

To address this criticism, sociologists have turned to two-wave panel models and found, for minor offenses, little evidence for deterrence (perceived risk had little effect on future crime) and strong evidence for an experiential effect (prior delinquency reduced future perceived risk) (see Williams and Hawkins 1986; Paternoster 1987). Piliavin et al. (1986) specify a full rational choice model of crime, including rewards to crime as well as risks, and find, for serious offenders, that rewards exert strong effects on crime, but perceived risk do not.

Recent longitudinal survey research has used more sophisticated measures of risk, better-specified models, and better statistical methods. Matsueda et al. (2006) specify two models based on rational choice. First is a Bayesian learning model of perceived risk, in which individuals begin with a baseline estimate of risk, then update the estimate based on new information, such as personal experiences with crime and punishment or experiences of friends. Second is a rational choice model of crime, in which crime is determined by prior risk of arrest, perceived opportunity, and perceived rewards to crime, such as excitement, kicks, and being seen

as cool by peers (see also McCarthy 1995; Hagan and McCarthy 1998). Using longitudinal data from the Denver Youth Survey, Matsueda et al (2006) find support for both hypotheses: perceived risk conforms to a Bayesian updating process (see also Pogarsky et al. 2004; Anwar 2011), and delinquency is determined by perceived risk of arrest, rewards to crime, perceived opportunities, and opportunity costs (see also Pogarsky and Piquero 2003). Similarly, Lochner (2007) uses two national longitudinal datasets and finds support for an updating model of “beliefs about the criminal justice system” and a deterrent effect of perceived risk.

Sherman (1990) has observed that the deterrent effect of interventions, such as police crackdowns or passage of more punitive legislation, often has an initial deterrent effect that diminishes with time. A simple explanation of this decay in deterrent effect is that criminals initially overestimate the effect of the policy change on certainty of getting caught, and consequently through Bayesian updating, adjust their risk perceptions downward (Nagin 1998). A second explanation of initial decay in deterrence derives from decision theorists’ concept of “ambiguity aversion.” In contrast to risk aversion, which refers to an event in which a probability can be assigned to every outcome, ambiguity aversion refers to an event in which the probabilities of outcome are unknown (Epstein 1999). A new intervention may increase the uncertainty of the risk perceptions of potential offenders, which will create a deterrent effect if offenders find uncertainty or ambiguity aversive. Over time, this ambiguity over risk may diminish, as offenders adapt to the new policy and sharpen their estimates of true risk. The important point here is that, even if the policy did not change the true certainty of punishment or the *mean* values of offenders’ subjective perceptions of risk, it may change the *variance* of risk perceptions, which will deter crime if offenders are risk averse (Nagin 1998). Sherman suggested that a policy of varying police crackdowns over time and space may increase

ambiguity in risk perceptions, and thereby more effectively deter crime. Loughran et al. (2011) found support for the deterrent effect of ambiguity aversion for crimes that did not involve contact between victims and offenders: at low levels of certainty of sanction, ambiguity reduced offending, whereas at high levels of offending, ambiguity increased offending.

Another way of addressing the causal order problem is with scenario or vignette methods. Here a specific crime scene is depicted in a written scenario and the respondent is asked to assess the probability of getting caught or getting rewards from the crime depicted. Then the respondent is queried for his intentions to engage in the crime. The method has the strength of embedding reported risk perceptions in the situation in which they should apply (Nagin 1998). Moreover, intentions data may be reasonable proxies for actual behavior (see Manski 1990; Dominitz and Manski 1997). The vignette method has the additional strength of random assignment of scenario characteristics—such as presence of witnesses, time of day, potential monetary returns—to vignettes in a factorial design, creating orthogonal regressors which allow one to obtain precise estimates of characteristics on outcomes (e.g., Rossi and Nock 1982). A weakness is the potential for a response effect: respondents who report high risk of arrest may be unlikely to admit to an intention to commit the crime due to social desirability effects. Vignette studies of deterrence and rational choice generally find robust effects of deterrence: certainty has a substantial effect on criminal intentions, while severity has modest effects. This holds for tax evasion (Klepper and Nagin 1989), drunk driving (Nagin and Paternoster 1994), sexual assault (Bachman et al. 1992), and corporate crime (Paternoster and Simpson 1996).

In sum, empirical research on an individual model of rational choice, deterrence, and crime finds consistent support for the model. As deterrence theory suggests, certainty of sanctions exerts a consistent deterrent effect on crime, although the severity of punishment exerts

a small and inconsistent effect. Consistent with rational choice, returns to crime—particularly psychic returns, such as excitement and high status among peers—and opportunity costs are both important predictors of future criminality.

Note that models of deterrence and crime are essentially depicting a two-person game between the criminal and the criminal justice system. Most research on deterrence, however, treats individual criminal behavior as endogenous with respect to the actions of the criminal justice system, which are assumed exogenous (that is the endogeneity of legal actors is treated as a nuisance to be overcome). Nagin (1998) and Swaray, Bowles, and Pradipto (2005) review economic research on the effects of interventions on the criminal justice system—in which the intervention is truly exogenous. A more complete treatment would model the legal system and the criminal as interdependent actors, using game theory—the use of mathematical models to tease out interdependent decision-making. McCarthy (2001) reviews applications of game theory, particularly two-person games, to the relationship between criminals and the legal system (see also Bueno De Mesquita, and Cohen 1995). McAdams (2009) reviews the relevance of game theory beyond the prisoner’s dilemma for law and legal analysis. By extending the equations used earlier, I can give an illustrative example, based on research by Bueno de Mesquita and Cohen (1995), of the utility of game theory in theorizing about criminal behavior, and drawing links between macro-structures and social interactions.

Bueno de Mesquita and Cohen (1995) show how an unjust social structure—containing selective barriers to human and social capital that undermine job attainment and wages—can change the incentive structure for criminal decisions. For individuals, there is uncertainty about fairness or justice in the social system. Therefore, we can define p_j as a measure of individual perceptions of the probability of justice or fairness in social institutions, and $(1 - p_j)$ as a measure

of perceived probability that society is unfair. The likelihood that an individual will be treated fairly by social institutions will affect the probability of returns to conventional activity. A fair society will allow individuals to gain income from conventional sources (I) based on p_i , the probability of getting a good job, which is based on ability, human capital, and social capital. An unfair society will prevent some qualified individuals from getting good jobs, which implies that those individuals will receive zero income from conventional jobs ($I = 0$), making total benefits equal to welfare, W . Therefore, if we incorporate fairness into our earlier equation (4), the utility from non-crime becomes:

$$E(U_N) = p_j [p_i U(I) + (1 - p_i) U(W)] + (1 - p_j) U(W) \quad (8)$$

In a completely fair society, in which all members perceive fairness, $p_j = 1$, utility from non-crime is $p_i U(I) + (1 - p_i) U(W)$, as above. But in a completely unfair society, in which all members perceive unfairness, $p_j = 0$, utility from non-crime is reduced to welfare, $U(W)$.

Then, modifying equation (5), the utility from crime, allowing fairness to vary, is:

$$E(U_C) = (1 - p_c) \{U(R) + p_j [p_i U(I) + (1 - p_i) U(W)] + (1 - p_j) U(W)\} + p_c U(R + W - C) \quad (9)$$

A crime will be committed when $E(U_C) > E(U_N)$; therefore, from (8) and (9), a crime will occur when the following holds:

$$(1 - p_c) \{U(R) + p_j [p_i U(I) + (1 - p_i) U(W)] + (1 - p_j) U(W)\} + p_c U(R + W - C) > p_j [p_i U(I) + (1 - p_i) U(W)] + (1 - p_j) U(W) \quad (10)$$

Stated in terms of perceived probability of injustice, crime will occur when

$$p_j < U(R) - p_c U(C) / p_c p_i U(I - W) \quad (11)$$

and it follows that

$$p_j p_c p_i U(I - W) < U(R) - p_c U(C) \quad (12)$$

This shows that as perceived justice increases, crime becomes less likely because the returns to conventional activity increase. Using these equations, Bueno de Mesquita and Cohen (1995) provide a game-theoretic analysis of changes in society's fairness, certainty and severity of punishment, probability that an individual will gain conventional income, and welfare policies. Their simulations reveal three important patterns. First, by increasing social justice, crime is reduced substantially. Second, the effect that poverty reduction policies have on crime depends on the policy: reducing poverty by welfare programs increases crime in the short run; conversely, reducing poverty by increasing the human capital skills of individuals reduces crime sharply. Third, crime is reduced substantially when policies of increasing human capital skills are combined with policies of increasing the probability of punishment.

Theory of Rational Addiction to Illicit Drugs

The rational choice model can also be applied to the consumption of illicit drugs. In their path breaking article, Becker and Murphy (1988) note that addiction or habit formation is pervasive throughout society. People often become addicted not only to drugs, alcohol, and cigarettes, but also to work, eating, music, and many other activities. Therefore, Becker and Murphy (1988) suggest that the explanatory power of rational choice theories would be seriously compromised if addictions required separate theories. They show how addiction, including drug addiction, can be explained within a rational choice framework in which individuals maximize expected utility subject to constraints and incorporate both past and future behavior in decision-making. In this way, addictive behavior is consistent with the usual assumption of optimization with stable preferences. This explanation consists of two parts. First is a backward-looking model, or "learning by doing," in which increases in past drug use (consumption) increase current drug use

by raising the marginal utility of current drug use. Second is a forward looking model, in which current consumption is a function of anticipated future utility: an individual expecting to consume drugs in the next period will consider the utility from that future drug use when maximizing utility of current drug consumption. Individuals recognize that consumption of beneficial goods (e.g., sex) increases future utility, whereas consumption of harmful goods (e.g., illicit drugs) reduces future utility. Thus, in making current decisions, rational actors trade off the present utility of drug consumption with the future utility of drug addiction. The model implies strong inter-temporal complementarity for drug consumption: consuming drugs at time one will be highly correlated with drug consumption at time two. A myopic (or backward looking) model is a special case in which individuals fail to consider utility of future behavior on current choices.

Empirical research on rational addiction models of drug use models the relationship between drug prices and drug use over time (e.g., Becker, Grossman, and Murphy 1994; Grossman and Chaloupka 1998). Drug use at time t is specified as a function of price at time t , drug use at time $t - 1$ (backward-looking), and drug use at time $t + 1$ (forward-looking).

$$C_t = \theta C_{t-1} + \beta \theta C_{t+1} + \theta_1 P_t + \theta_2 \varepsilon_t + \theta_3 \varepsilon_{t+1}$$

where C_t is present consumption, C_{t-1} is past consumption, C_{t+1} is future consumption, θ is a parameter reflecting addiction, β is a time discount factor ($1/[1 + r]$) assumed to be less than one, θ_1 is a coefficient for price P_t , and

$$C_{t-1} = \theta C_{t-2} + \beta \theta C_t + \theta_1 P_{t-1} + \theta_2 \varepsilon_{t-1} + \theta_3 \varepsilon_t$$

$$C_{t+1} = \theta C_t + \beta \theta C_{t+2} + \theta_1 P_{t+1} + \theta_2 \varepsilon_t + \theta_3 \varepsilon_{t+2}$$

To address the obvious endogeneity problem, price at time $t - 1$ is used as an instrument for drug use at time $t - 1$, price at time t is used as an instrument for drug use at time t , and price at time t

$+ I$ is used as an instrument for drug use at $t + I$. Identification is achieved by the perhaps plausible assumption that price at $t - I$ and price at $t + I$ have no effects on drug use at time t , net of price and time t . Such models have the weakness of assuming perfect foresight, although partial foresight models are tractable here.

Using data from the national Monitoring the Future dataset as well as data on marijuana prices (from Drug Enforcement Agents' attempts to purchase marijuana in 19 cities for 1982-1992), Pacula et al. (2000) estimates price elasticity of demand, estimating that a one percent increase in price reduces demand by about 30 percent. They find, however, that peer effects and attitudes are the strongest predictors of marijuana use. Using the same data, Chaloupka et al. (1999) find that youth living in decriminalized states were more likely to use marijuana than in other states, and that youths' consumption patterns were responsive to median fines for possession of marijuana. In contrast, Farrelly et al. (1999), using fixed-effects models on the National Household Survey on Drug abuse, find no relationship between fines and marijuana use. This line of research assumes that youth are aware of the objective costs of marijuana use, and use those costs in their decision-making. It has been criticized for assuming that youth are able to anticipate future prices of marijuana accurately. On this point, with respect to cigarettes, Gruber and Köszegi (2001) argue that a more reasonable assumption is that individuals are able to anticipate future changes in excise taxes because they tend to be publicized, whereas increases in cigarette prices are rarely announced in advance. Using data on excise taxes, Gruber and Köszegi (2001) find support for a forward-looking model of rational addiction for cigarette smoking.

The theory of rational addiction is an audacious attempt to explain addictive behavior—an act that is almost always deemed irrational—within a conventional rational choice framework.

It has received remarkably substantial empirical support on a wide variety of addictive behaviors. With respect to illicit drug use, such as marijuana and cocaine, future research is needed to explore whether youth are able to anticipate future prices accurately, how they acquire that information, and whether effects of future prices persist when controlling for other time-varying covariates, such as changes in the certainty of arrest, peer effects, and local supply of the drug.² Nevertheless, these results allow us to apply forward-looking rational choice principles for addiction, crime, and conventional behaviors as a micro-foundation for macro-sociological theories.

² For a critique of Becker and Murphy's theory of rational addiction, see Elster (1997).

THE MICRO-MACRO PROBLEM IN SOCIOLOGY

Sociologists have long attempted to overcome the bifurcation of the discipline into separate sub-disciplines of social psychology and social organization by identifying specific linkages between micro- and macro-levels of explanation (e.g., Hechter 1983; Alexander, Giesen, Muench, and Smelser 1987; Huber 1991). Such linkages would presumably help overcome criticisms lodged at myopic theorizing and research operating at single levels. For example, structural theories—and the macro-level research they stimulate—typically explain system outcomes based on causal mechanisms operating at the macro-level, thus ignoring the role of individual actors. Such theories have been criticized for being crudely functionalist (a system outcome is explained by a system characteristic defined by its function), obviously teleological (a system outcome is explained by a system level purpose), and unlikely to identify effective interventions to bring about positive social change (e.g., Coleman 1990). Individual-level theories of purposive action—and the micro-level research they stimulate—explain individual outcomes based on causal mechanisms operating at the individual level, with macro outcomes assumed to be mere aggregations of such processes. These theories have been criticized for trivializing the role of social organization and oversimplifying the micro-macro problem.³

Among the many proffered solutions to the micro-macro problem (e.g., Sawyer 2001), perhaps the most distinctive approach, outlined in a series of papers and chapters by Coleman (1983, 1986, 1990), specifies that macro-level relationships are brought about by micro-level processes, and vice-versa, through a series of micro-macro transitions. Figure 1 illustrates these relationships. Macro-social theories focus on link 4 between a macro-level context (e.g., social

³ Economists have attempted to model “social interaction effects,” such as peer effects, using standard economic approaches, including using the method of revealed preference to capture utility maximization processes, and instrumental variables to identify social interaction effects, which are unmeasured peer effects disentangled from contextual effects, selection effects, and correlated individual effects (see Manski 1995; Brock and Durlaf 2001).

structure) and a macro-level outcome (e.g., rates of crime). Micro-individual theories focus on link 2 between a micro-level predictor (e.g., human capital investment) and a micro-level outcome (e.g., earnings). These two levels are connected by two cross-level linkages. Link 1, commonly investigated in sociological studies of individual behavior, shows how macro-context (e.g., social class) conditions individual attributes (e.g., human capital investments), which in turn produce micro-level outcomes (e.g., earnings) through a micro-level theory (e.g., micro-economic theory). The other cross-level relationship, link 3, is less studied and more complicated. Here, individual outcomes combine to produce macro-level outcomes (e.g., social organization). Stated differently, the question becomes, “How are interdependencies formed among individual actors to organize action?” Here, Coleman uses the concept of emergence to show how “collective phenomena are collaboratively created by individuals yet are not reducible to individual action” (Sawyer 2001). For Coleman (1990, p. 5), emergence is tied to purpose in interaction: “The interaction among individuals is seen to result in emergent phenomena at the system level, that is, phenomena that were neither intended nor predicted by the individuals.” This allows for more complexity than the simple assumption, made by reductionists and some economists, that collective phenomena are merely the aggregations of individual actions.

The ways in which individual purposive actions combine to create macro-level outcomes vary by the complexity of the social organization being constituted and reconstituted. In the simplest case of bilateral exchange between two actors, an agreement or contract governing the exchange is the macro-level outcome. In this case, the macro outcome is intended by the individuals. Bilateral exchange between two parties can also result in externalities, which are costs or benefits to third party stakeholders—usually in the form of a public good—for which compensation is neither collected nor paid. Thus, parties to the exchange do not necessarily reap

all the costs or benefits of the transaction. This can be seen as an application of Merton's (1936) concept of unanticipated consequences of action to exchange relationships.⁴ Externalities, which can be positive or negative, constitute the most elementary form of moving from individual action to system-level properties. Nevertheless, externalities may be the most prevalent micro-macro link in any society, and exemplify the notion of emergence. I will use this elementary form of building social organization to link individual rational choice to neighborhood social capital.

Bilateral exchange can be generalized to multilateral exchange, such as a market, in which the system level-outcome is a set of prices. This is perhaps the prototypical micro-to-macro transition, because it demonstrates that certain outcomes (such as the exchange price of goods) cannot be reduced to an aggregation of individual behaviors, but rather entail a broader social organization—in this case the organization of the market. Prices are an emergent explained by equilibrium theory, in which individual capital and preferences combine to produce equilibrium prices through competitive exchange.

Another micro-macro link concerns authority and control. Individuals that trust others may give up rights of control of certain actions to those others. Such vesting of authority in others provides the basis for the emergence of social norms, an emergent property of social systems based on common interests of the individuals. Authority relations and norms governing those relations, of course, are key elements of hierarchical organizations, authority structures, and formal organizations.

⁴ Although Merton (1957, p. 51) emphasized the latent functions of unanticipated consequences for the social system, he also noted that unanticipated consequences can also be latently *dysfunctional* or irrelevant to the functioning of the social system.

I will illustrate the micro-to-macro transition with examples drawn from recent criminological research. To frame these examples theoretically, I use Sutherland's classical criminological concept of differential social organization.

DIFFERENTIAL SOCIAL ORGANIZATION AND CRIME

Edwin Sutherland, perhaps the most important criminologist of the twentieth century, is best known for coining the term “white collar crime” and developing his individual-level learning theory of crime, differential association. Sutherland (1947) also developed the concept of differential social organization—a macro-level counterpart to his individual-level theory—to explain the distribution of aggregate rates of crime: the crime rate of a group or society is determined by the extent to which that group or society is organized against crime versus organized in favor of crime. Sutherland, however, failed to expound on the macro portion of the theory, leaving the conception of organization empty of content, except by illustration. For example, organization against crime includes strong conventional institutions that inculcate conventional commitments in individuals, such as having a job, investing in education, owning a home; organization in favor of crime includes nefarious organizations such as delinquent gangs, professional theft rings, and criminal organizations like the Mafia. Clearly, the theory would be more powerful if the concrete content and causal mechanisms of such organization were specified explicitly.⁵ In the following sections, I will attempt to specify such concrete causal mechanisms, drawing on rational choice theory as a micro-foundation, and showing how social organization is built up by identifying micro-to-macro transitions. The next section specifies mechanisms of organization against crime using recent research on social capital and collective efficacy. This is followed by a discussion of organization in favor of crime using the protection racket of the Sicilian Mafia.

⁵ For an extended discussion of these issues and an initial attempt to specify concrete causal mechanisms of organization against crime and organization in favor of crime, see Matsueda (2006).

SOCIAL CAPITAL, COLLECTIVE EFFICACY, AND ORGANIZATION AGAINST CRIME

Social Capital Theory

One of the most important recent theoretical innovations in the social sciences has been the development of the concept of social capital. The concept has been popularized by Putnam (1995, 2001) who defines social capital as elements of social organization, such as “networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit,” and laments the decline of civic participation and social capital in contemporary society. Similarly, Bourdieu (1986) defines social capital as the “aggregate of the actual or potential resources that are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition—or in other words, to membership in a group—which provides each of its members with the backing of the collectively-owned capital, a ‘credential’ that entitles them to credit in the various senses of the word,” and shows how unequal access to social capital helps reproduce social inequality.

Perhaps the most rigorous and developed conceptualization of social capital is due to James Coleman (1988, 1990). A distinctive feature of Coleman’s version, which separates it from others, such as Putnam (2001) and Bourdieu (1986), is its explicit value in making the micro-to-macro transition. Indeed, in his early writings about the micro-macro problem, Coleman (1986, 1988) discusses the role of exchange relationships, authority relations, social norms, and information flows—all of which he later captures under the umbrella of social capital—as examples of the micro-to-macro transition. Coleman’s version of social capital builds on Granovetter’s (1985, p. 487) argument that purposive action of individuals is “embedded in concrete, ongoing, systems of social relations,” which generate interpersonal trust.

Social capital is defined by two characteristics: it inheres in the structure of social relationships, and not within an individual, and it facilitates certain forms of purposive action (Coleman 1990, p. 302). From the standpoint of individuals, social capital is a resource that can be used by members of social systems to realize their interests. In this way, it is a capital asset, as is physical capital and human capital, although one that is much less tangible and not “owned” by individuals. From the vantage point of the social system, social capital is the stuff that binds individuals, the fundamental elements of social organization, the medium through which social structure facilitates purposive actions of individuals, and as importantly, the medium through which those actions constitute and reconstitute that structure. In this way, social capital accounts for interdependencies among otherwise atomized individuals. More specifically, For Coleman (1990), social capital consists of four dimensions: (1) obligations and expectations, (2) informational potential, (3) norms and effective sanctions, and (4) authority relations.

Obligations and expectations, or reciprocated exchange, constitute the most elemental form of social relationships. Actors seek to realize their interests by engaging in bilateral exchange with others—doing favors for each other, which is made possible by the norm of reciprocity and the existence of trust in the social system. When one actor does a favor for a second actor, the second is now indebted to the first who can call in the favor at a future date when it is needed to attain an important objective. Favors are unpaid obligations to be fulfilled at the time of one’s choosing. Social systems with dense social networks of outstanding obligations are said to be rich in social capital (Coleman 1990).

A second form of social capital is the information potential that inheres in social relationships and is principally transmitted interpersonally. Information can be used by individuals to facilitate purposive action. As Granovetter (1973) has argued, the form and utility

of information may vary by the strength of social relationships. Strong ties within a homogenous group lead to the circulation and recirculation of similar ideas and information. Weak ties between members of heterogeneous groups—so-called “bridging ties”—may expose members of each group to novel information and new ideas because the information is coming from dissimilar individuals occupying disparate roles. Such information can have more utility for certain purposive actions, such as finding a job. Other information derives from the media, a social institution.

A third form of social capital consists of norms, which specify proper or improper conduct, and are enforced by sanctions (for an excellent overview, see Hechter and Opp 2001). Norms are needed when an externality affects a collection of individuals (third parties) similarly, and can be resolved by neither bilateral exchange between the perpetrator and the third parties, nor a market solution in which third parties purchase the right of control from the perpetrator (Coleman 1990). Like other forms of social capital, norms are properties of social structure and are more effective when structures are closed because enforcers of the norm can then coordinate their monitoring and sanctioning. A norm entails a transfer of control over behavior from an individual to a collective—thus, it is a form of multilateral control. Norms facilitate purposive action by coordinating otherwise atomized individual actions.

The final form of social capital is authority relations, in which individuals transfer control of certain behavior to another individual, the authority, who now exercises power over the others. Weber’s ([1921/1922] 1978:241) notion of charismatic authority is a special case of an authority relation in which a single leader, endowed with “exceptional powers or qualities” is given control over the behaviors of many. Authority relations are the most elaborate form of

social capital, and appear in large hierarchical structures and other complex forms of social organization.

A number of empirical studies have examined the relationship between social capital and criminal and deviant behavior. For example, Rosenfeld, Messner, and Baumer (2001) use individual-level data from the General Social Survey to measure social capital with attitudes about trust, fairness, and being helpful, as well as voting behavior and membership in Elks Clubs. They then aggregate the responses to the 99 GSS primary sampling units and, using a simultaneous equation model, find social capital to predict homicide rates. Using a different survey dataset of individuals within 40 geographic areas, Messner, Baumer, and Rosenfeld (2004) find that aggregate measures of trust are negatively associated with homicide rates. Using survey data on Berlin youth, Hagan, Merckens, and Boehnke (1995) find that family and school social capital are negatively associated with right-wing extremism and school delinquency. Finally, Lederman, Loayza, and Ana Menéndez (2002) use data from the World Values Survey (2002) and find (using instrumental variables to address simultaneity) that trust within the community is consistently negatively associated with rates of homicide across 39 countries. These studies suggest that social capital may be important for the etiology of homicide and delinquent behavior.

Neighborhood Social Capital, Collective Efficacy and Informal Social Control

Perhaps the best application of social capital to crime has been carried out by Sampson and colleagues (e.g., Sampson, Raudenbush and Earls 1997; Sampson, Morenoff, and Earls 1999; Sampson and Raudenbush 1999). They merge Coleman's (1990) dimensions of social capital with Bandura's (1986, 1997) notion of "collective efficacy." Bandura (1986:391) is well-known for his concept of self-efficacy, which he defines as "people's judgments of their capabilities to

organize and execute courses of action required to attain designated types of performances.” For Bandura, if the level of skill and opportunity are held constant, individuals who perceive a high degree of personal efficacy will outperform those with little self-efficacy because they can act with persistence, overcome obstacles, and capitalize on narrow opportunities. Self-efficacy is learned through self-observations of performance, vicarious observations of others, making social comparisons, and the like. The perceived efficacy of a group, a shared belief in acting collectively to achieve an objective, is not the mere sum of the individual personal efficacies of members. Instead, collective efficacy—members’ perceptions of the efficacy of the collectivity—will “influence what people do as a group, how much effort they put into it, and their staying power when group efforts fail to produce results” (Bandura 1986:449). Again, for Bandura, individuals’ *perceptions* of the group’s ability to “solve their problems and improve their lives through concerted effort” are more important than the *objective* ability of the group (p. 449).

The insight made by Sampson and colleagues is to apply the concept of collective efficacy to neighborhood action, tie it to Coleman’s (1990) concept of social capital, and obtain operational indicators of it taken from previous neighborhood surveys (e.g., Taylor 1996). Sampson, Raudenbush and Earls (1997, p. 918) treat collective efficacy as a task-specific property of neighborhoods—namely, “the capacity of residents to control group level processes and visible signs of disorder” which helps reduce “opportunities for interpersonal crime in a neighborhood.” This definition echoes the flip side of Shaw and McKay’s (1969 [1942]) concept of social disorganization, defined succinctly as “the ability of local communities to realize the common values of their residents or solve commonly experienced problems” (Bursik 1988:521; Kornhauser 1978:63). For Shaw and McKay, social disorganization is tied directly to

the absence of local community institutions, organizations, and social ties. For Sampson et al., collective efficacy is tied directly to the presence of neighborhood social capital: “it is the linkage of mutual trust and the willingness to intervene for the common good that defines the neighborhood context of collective efficacy” (1997: 919). Thus, collective efficacy translates the resource potential of neighborhood social networks—i.e., social capital—into “active support and control of children” and thereby reduces the rate of youth crime (Sampson et al. (1999: 635). This formal definition of collective efficacy emphasizes the *objective* capacity of a neighborhood to intervene for the common good, rather than members’ *perceptions* of that capacity, as emphasized by Bandura (1986). Ironically, in operationalizing collective efficacy, Sampson et al. (1997; 1999) use measures of residents’ *perceptions* of collective efficacy.

In their empirical research, Sampson et al. (1997: 919) treat collective efficacy as an objective characteristic of neighborhoods, emphasizing that “it is the linkage of mutual trust and the willingness to intervene for the common good that defines the neighborhood context of collective efficacy” which results in informal social control. They identify two neighborhood-level concepts, “social cohesion and trust” and “informal social control,” that constitute collective efficacy, and collect measures of each using residents of 343 neighborhood clusters in Chicago—from the community survey of the Project on Human Development in Chicago Neighborhoods (PHDCN). For each construct, they use respondents as informants on the neighborhood characteristic, asking them, for example, “are people in the neighborhood willing to help neighbors” and “do neighbors trust each other” (cohesion and trust), and “would you agree that your neighbors could be counted on to intervene if children were skipping school and hanging out on street corners?” (informal social control). After combining the two constructs into a single collective efficacy variable, Sampson et al (1997) find that disadvantage,

immigration, and residential mobility are associated with collective efficacy in the expected negative direction. They also find that collective efficacy is negatively associated with homicide and violent victimization, and to some extent mediates the effects on violence of neighborhood structural covariates.

Sampson, Morenoff, and Earls (1999) use the PHDCN, but operationalize collective efficacy slightly differently, and examine spatial processes—spillover effects from one locale to another—across neighborhoods. They retain the concept of informal control, renaming it child-centered control, drop social cohesion and trust, and add two new neighborhood-level constructs: intergenerational closure (relationships among parents and children in the neighborhood) and reciprocated exchange (exchange of favors between neighbors). After combining the new constructs into a single index of adult-child exchange, they find the index to be positively associated with concentrated affluence and residential stability, and negatively associated with population density. Sampson et al. (1999) find child-centered social control to be positively associated with affluence and negatively associated with disadvantage, immigration, and population density. Finally, they find positive spatial effects: net of other covariates, a given neighborhood's collective efficacy is positively associated with that of contiguous neighborhoods. Moreover, this effect is racially patterned: white neighborhoods disproportionately enjoy the advantage of spillover effects from surrounding high efficacy neighborhoods, while black neighborhoods are doubly-disadvantaged, suffering from low average efficacy and the absence of surrounding efficacious neighborhoods.

Using the PHDCN data, research has also found that collective efficacy is related to rates of violence. Morenoff, Sampson, and Raudenbush (2001) find that spatial proximity to neighborhoods with high homicide rates is strongly related to increased homicide rates.

Concentrated disadvantage and low collective efficacy are also positively associated with homicide. Finally, Sampson and Raudenbush (1999) use the PHDCN dataset and find that collective efficacy is strongly related to homicide, burglary, and robbery. Moreover, they test the “broken windows” hypothesis of Kelling and Coles (1997), which argues that physical disorder, or incivilities, such as graffiti, broken windows, and litter, directly induces crime by signaling to criminals that residents are indifferent to crime. Using a simultaneous equation model to control for reciprocal effects of disorder on collective efficacy, they find that the correlation between disorder and crime is spurious due to the confounding variable, collective efficacy. Therefore, they conclude that collective efficacy theory is supported over the broken windows hypothesis.

Research on neighborhood collective efficacy is one of the best applications of social capital theory to a specific social problem. As a theory of neighborhood social organization, however, it operates exclusively at the macro-sociological level, implicitly treating the neighborhood as a corporate actor, and ignoring—or at least remaining agnostic about—micro-level processes and potential links between individual actors and neighborhoods. An important theoretical task would specify a micro-level model of purposive action compatible with the macro-level concept of collective efficacy.

An Individual-Level Model of Investment in Social Capital

Empirical studies of collective efficacy specify macro-level neighborhood models that estimate macro-relationships, labeled link (4) in Figure 1 above (see Figure 2). This specification is appropriate and consistent with Sampson et al.’s (1997, 1999) conceptualization of collective efficacy as a macro-level (neighborhood) concept produced by macro-structure (community structural characteristics)—a position, of course, known as methodological holism, in which an

internal analysis of social systems is eschewed in favor of identifying causal mechanisms at the system level. Adopting a position of methodological individualism, however, may provide a window for examining the collective action dynamics by which social capital is translated into collective efficacy.

Moreover, as Coleman (1990) argues, there are distinct advantages to adopting a position of methodological individualism, in which macro level processes are linked to an internal analysis of the social system. From a theoretical standpoint, specifying an individual-level model of purposive action helps address the teleological problem in macro-level theories, in which outcomes are explained by future states or purposes. In our case, collective efficacy theory may be vulnerable to the accusation that it is a functionalist explanation: the theory assumes consensus among residents in a desire for a safe neighborhood and argues that neighborhood collective efficacy functions to insure a safe neighborhood. By treating consensus not as an assumption, but as a goal that must be achieved by residents, by specifying purpose at the individual level, by allowing for unintended consequences of purposive action, and by explaining outcomes in terms of efficiency rather than final states, we can move away from teleological explanation and vulnerability to functionalist critique.

An individual level model of purposive action eventuating in collective efficacy begins with a utility maximization model of neighborhood social interaction. A number of economists, focusing on memberships in civic associations, have found that investments in social capital follow a standard economic investment model: individuals invest in social capital when there are private incentives to do so—such as home ownership, close spatial proximity, fewer opportunity costs for time, and complementarities (peers with more social capital). They theorize that aggregation is complex because of externalities, which can be positive (networks) or negative

(status) (e.g., Glaeser, Laibson, and Sacerdote 2002). Durlauf and Fafchamps (2005), in particular, have reviewed the economics of social capital literature and identified conditions under which social capital will increase Pareto optimality.

I focus on the most elementary and fundamental form of social capital, social exchange—the practice of exchanging obligations and favors—and draw from the classic writings of Peter Blau (1964). Blau (1964:91) defines social exchange as “voluntary actions of individuals that are motivated by the returns they are expected to bring and typically do in fact bring from others.” In contrast to economic exchange, in which a formal contract stipulates the precise nature and quantity to be exchanged, social exchange entails only a general expectation of future reciprocation, whose nature and quantity is left unspecified and open-ended. Whereas economic exchange is depersonalized by institutional rules and expectations, social exchange is personal, and “engenders feelings of personal obligation, gratitude, and trust” (Blau 1964:94).

Most favors contain an implicit promise to be repaid at some future date. Of course, as in all promises, there is extreme asymmetry of information over the promissory property of favors: the party receiving the favor knows much more about the likelihood of honoring it than the party giving it. We assume that individuals seek to maximize utility under constraints in asking for favors and doing favors for neighbors. Thus, residents ask neighbors to borrow tools to facilitate achieving a goal of fixing a car, repairing a home, or shoveling snow. But other potential benefits may accrue, such as deriving pleasure from an enjoyable interaction, gaining social approval or a degree of respect, and building solidarity with the neighborhood. Residents may ask their neighbors to watch their home or monitor their children when they are away. Here, residents are seeking assistance in protecting their property, a necessary goal in a context in which trust of others—particularly new acquaintances—is imperfect. Failure to reciprocate will

produce distrust and eventually end the relationship; repeated reciprocation builds trust, commitment, and strengthens relationships.⁶ Repeated reciprocation within organized groups often produces norms of reciprocity, which include sanctions for failure to reciprocate.⁷ Finally, repeated reciprocal exchanges are subject to diminishing marginal utility: continual social exchange between the same pair of actors reduces the benefits each receive (Blau 1964).

Why do rational actors do favors for neighbors when there is a risk of non-reciprocation, and even if reciprocated, the return favor will likely have the same or less utility as the initial favor? One rational reason pertains to the timing of the return favor. The initial favor creates an unspecified debt whose settlement is postponed. A rational actor can specify when the debt should be paid—for example, at a time when the actor is in dire straits, and the utility of the return favor is amplified (Coleman 1990). Thus, reciprocated exchange can be explained using a simple utility maximization model. But how does social exchange translate into social capital and collective efficacy?

From Reciprocated Exchange to Collective Efficacy

There are two intersecting neighborhood social systems relevant to the generation of social capital and collective efficacy. The first is a system that generates reciprocated exchange among neighbors, creating social capital; the second is a system translating social capital into collective efficacy, the capacity to solve local problems collectively. Each system entails links between micro- and macro-processes, and illustrates how communication and consensus building can

⁶ This proposition is actually more complicated. Individuals seeking power over another may offer services or gifts that are too extravagant to be reciprocated, creating a burden of obligation to the individual seeking power. The result may be a relation of superiority-inferiority, rather than the egalitarian relation created with reciprocated exchange (Blau 1964).

⁷ Institutions and norms often provide opportunities for gaining trust. For example, favors that are repaid immediately are ineffective at building trust. Most favors, such as cooking dinner, helping to fix a car, or throwing a party entail an implicit structured delay in the expected reciprocation, increasing the likelihood of building trusting relationships (Blau 1964).

produce more efficient (collective) forms of purposive action. By describing the two systems, and their interrelations, I provide a picture of the obstacles facing neighborhoods in developing high levels of social capital, collective efficacy, and ultimately, personal safety.

Creation of Social Ties. Let us begin with the creation and maintenance of social ties among residents. This is the most elementary form of social capital, described by Coleman (1990) as obligations and expectations among individuals, and Sampson et al. (1997) as neighborhood reciprocated exchange. Start with a set of residents who engage in reciprocated exchange with their neighbors for their private instrumental purposes—borrowing tools to fix the plumbing, helping to pull out a tree, lending a hand to fix a car. Coleman (1990) points out that the resulting social ties among neighbors can have a positive externality for the neighborhood as a whole—the creation of neighborhood social capital. Once created, social capital becomes a resource available for individuals to facilitate purposive action, such as maintaining a safe neighborhood through informal social control. Neighborhoods rich in social capital (in the form of dense social ties) will have a large capacity to solve local problems—in other words, they will have collective efficacy (Sampson et al. 1995). But how are those social ties increased and maintained over time? How are they translated into the neighborhood’s capacity to accomplish shared goals, such as maintaining a safe neighborhood?

Neighborhoods with residents who, individually, have a high propensity for interacting and doing favors for each other will enjoy a high degree of social capital in the form of reciprocal obligations and expectations. These social ties translate into social capital as a positive externality, which generally facilitates residents’ purposive actions, including individual instrumental behavior and collective behavior on behalf of the neighborhood as a whole. Some neighborhoods—and specifically within those neighborhoods, some key residents—may become

aware of the relationship between dense social ties and the ability of neighborhoods to solve shared problems collectively.⁸ They may recognize that some residents are relatively isolated, and realize that if they were more involved, the neighborhood would be better off.

Consequently, they have an incentive to encourage those isolated residents to become involved, and urge their neighborhood friends to encourage involvement as well. Over time, they may convert some neighbors with persuasion and rewards in the form of informal approval such as smiles, pats on the back, and kudos, while at the same time questioning, gossiping about, or even demeaning neighbors who remain isolated. In this way, social capital is increased in the neighborhood over and above the sum of effects of high individual propensities to interact. But in a neighborhood where residents become aware of the link between neighborhood ties and neighborhood solidarity, some residents will realize that they can enjoy the fruits of neighborhood social capital—because it has a public goods aspect—and not contribute to such ties. In the parlance of rational choice theory, they have an incentive to free ride on the actions of others.

To reduce the number of free riders, residents might provide selective incentives, such as informal approval or disdain, and even coordinate sanctioning in pairs, which would be facilitated by social ties between pair members (Olson 1971). A more efficient way of eliciting compliance than the use of selective incentives by relatively unorganized individuals would be to create a norm—a general rule backed by collective sanctions—prescribing being “neighborly.” Such a norm necessitates building a working consensus over the value of being neighborly, the transfer of control from individual residents to the neighborhood as a whole, and the appropriate

⁸ The process of becoming aware of the production of externalities entails overcoming obstacles of information and corresponds precisely to Merton’s (1936) discussion of becoming aware of unanticipated consequences of purposive action.

sanctions for violators.⁹ This consensus, in turn, requires communication and social ties. Thus, neighborhoods in which a critical mass of residents have developed social ties for personal instrumental reasons would have the social capital necessary to facilitate creation of more social capital through creating norms of being neighborly. This may follow a threshold model, in which a critical mass of social ties is needed to communicate and create consensus over a norm of neighborhood participation. Social capital, then, builds upon itself: social ties created for one purpose provide positive externalities facilitating the creation of new forms of social capital, which create more social ties. The norm requires group members to enforce the norm by sanctioning, which can entail a cost, particularly if the sanction is negative. Here, rational actors will again have an incentive to free ride, relying on neighbors to sanction norm-violators, without contributing to sanctioning themselves. To overcome this problem—the second-order public goods problem—residents might use only positive, relatively costless sanctions, such as informal approval.¹⁰

Creation of Collective Efficacy. The existence of neighborhood social ties is a prerequisite for residents to act collectively to combat youth crime and incivilities. Youth crime, which violates essential conjoint norms, may be rational from the standpoint of youth, but also provides negative externalities for local residents.¹¹ For example, vandalism may upset the victimized home owner, but also reduce the attractiveness and consequently property values of the

⁹ The consensus underlying a social norm directly reduces the cost of sanctioning: control is at least partially transferred from the transgressor to the collection of residents as a whole, and therefore, some individuals will conform—that is, not free ride—because of the mere threat of sanction (see Coleman 1990). My use of the concept of social norms draws from Coleman's (1990) pioneering treatment; for a critique of this treatment, see Elster 2003).

¹⁰ Another mechanism to induce greater social ties is to exclude isolates from access to social capital, thus transforming social capital from a public good to a “club good” (Buchanan 1965). In the present case, the costs of exclusion are likely too steep for this to be a practical solution (see Sandler and Tschirhart 1994).

¹¹ Conjoint norms are those for which the beneficiary and target is simultaneously the same person, such as laws intended to avoid a Hobbesian war of all against all: all citizens are simultaneously potential targets if they succumb to temptation, and beneficiaries when the norms are enforced (Voss 2001). Juvenile status offenses apply solely to juveniles and thus are disjoint norms; crimes that violate adult statutes apply to all citizens, making them conjoint norms. Such a distinction is more complex for community-specific norms, since they may be applied to outsiders, who are not beneficiaries.

neighborhood as a whole. Residents can respond by attempting to intervene in isolation, confronting the youth, scaring the youth off, or threatening to call the police. Such monitoring and sanctioning entails a cost—youth could fight back, retaliate, or threaten, and even calls to the police takes time and energy. Isolated acts of intervention require the individual to shoulder the entire cost of intervening, including investing time and energy, absorbing opportunity costs, and facing potential retaliation or unpleasant interaction with the offender. Regardless of the self-efficacy of the individual, the probability of intervention is probably low due to its high cost. When the negative externalities affect multiple residents similarly—for example, costs such as creating an unsafe environment for children, reducing property values, or inducing fear and anxiety—the potential for a collective response exists. When neighborhoods are disorganized and residents disconnected, collective action is difficult and unlikely. When social ties are dense, residents can coordinate their monitoring and sanctioning through communication, reaching a consensus on the problem, identifying a strategy for addressing the problem, and encouraging all members to agree to contribute (e.g., Hechter 1987). Efficient strategies might include reducing the costs of sanctioning by jointly sanctioning in pairs, rotating the monitoring among neighbors, watching over children within the neighborhood, and relying on stay-at-home moms and busybodies to monitor the neighborhood and exchange gossip about problem children.

Each of these strategies is facilitated by social capital. For example, developing rotating monitoring, in which neighbors take turns overseeing and sanctioning, may require that all committed residents contribute their share of monitoring, and therefore, take the form of an assurance game.¹² Here, in a two-person, non-repeated game, the key is developing trust of others because if players are trustworthy, each knows the other will contribute and they will

¹² For this to be an assurance game, we must assume that the good—creating a safe neighborhood—can be produced only if all the players (neighbors) contribute.

attain the optimal equilibrium of mutual cooperation (Kollock 1998). Thus, neighborhoods rich in reciprocated exchange will have built up the requisite trust to optimize assurance games, such as rotated monitoring. Another example is monitoring and sanctioning of neighborhood children, which is facilitated by intergenerational closure of social networks. If parents know the parents of their children's friends, they can coordinate their monitoring and sanctioning with other parents, presenting a united front, and sanctioning consistently (Coleman 1990). Some parents may get to know the parents of their children's friends as a byproduct of social activities; the resulting social capital can be used strategically for monitoring their children. Other parents may become aware of such effects and intentionally seek out the parents of their children's friends. Monitoring and sanctioning is facilitated by the dissemination of information—another form of social capital—relevant to controlling youth, including negative gossip about local youth who get in trouble and may be labeled “bad seeds.” A strong gossip network can be crucial for neighborhood informal social control by providing information and reducing the costs of monitoring and sanctioning (Merry 1984). Reducing the costs of sanctioning youth is important because punitive sanctioning of youth is potentially very costly due to the possibility of conflict between youth and adult. Such costs can be reduced by sanctioning jointly, which in turn is dependent on social ties among rule enforcers. Thus, social ties, consisting of obligations and expectations, allow individual enforcers to coordinate and call in favors to diffuse the cost of sanctions (Coleman 1990: 270).

When other residents are willing to stick their neck out and sanction youth transgressors, it is in the interest of any one resident to free ride—enjoying the resulting safety while avoiding the cost of personally intervening in youth trouble. As we saw with reciprocated exchange, free riders can be more efficiently suppressed by creating a norm than by merely using individual

uncoordinated selective incentives. The norm, a conjoint and essential norm, would encourage all residents to engage in monitoring and sanctioning of youth indiscretions to maintain a safe neighborhood. It would require building consensus, allowing some control over individuals to be ceded to the collectivity. Thus, the mere existence and legitimacy of the norm will induce some to act on behalf of the neighborhood. But to be more effective, the norm must be backed by effective sanctions to overcome the benefits from free riding. The use of informal social approval would be less costly than the use of punishment such as expressions of disapproval. Such informal sanctions will be more effective in neighborhoods with greater social networks—particularly closed network structures (see Coleman 1990: 318)—allowing joint sanctioning and providing enforcers with leverage (such as outstanding obligations) to use in sanctioning. When interactions are repeated, residents care about their local reputations, and simple sanctions, such as kudos have value for recipients (Kollock 1998). Moreover, informal social approval has the potential of transforming monitoring and sanctioning into zealous behavior: here, enforcers would have a two-fold gain in benefits—the intrinsic reward of helping to reform and deter youth and the secondary reward of receiving social approval from other residents (Coleman 1988). Because of this multiplier effect, neighbors will respond by sanctioning each other with zeal, increasing the likelihood that a given resident will contribute to the public good by intervening when problems in the neighborhood arise. Such processes, however, cannot increase indefinitely, but have a natural upper bound. The use of kudos, social approval, and conferring social status have limits as rewards in finite groups because, as Kitts (2006) has shown, when such incentives are rival—that is, rewarding one neighbor will reduce the value of the reward to remaining neighbors—perverse outcomes can result, such as development of an anti-social norm in which neighbors try to stop other neighbors from rewarding others.

In neighborhoods characterized by social structures conducive to zealous monitoring and sanctioning, very high levels of collective efficacy are expected. Such zealous activity is likely to lead individuals to internalize the norms of monitoring and sanctioning. Here, external sanctions are no longer necessary to elicit conformity because residents sanction themselves by inducing guilt. Residents who have internalized the norms come to identify with the neighborhood as a collectivity: the neighborhood, along with the norms shared by residents, becomes a component of their selves. In the words of Mead (1934), the neighborhood becomes a part of their generalized other. In such a case, intervention—that is, monitoring and sanctioning—becomes an automatic response to neighborhood youth incivilities. Moreover, when automatic responses fail, residents are able to identify alternative courses of action from the standpoint of the neighborhood as a collectivity (because residents have participated in exchange with multiple other residents), which includes the goals, complex roles, and expectations attached to those roles of the neighborhood.

A final dimension of neighborhood collective efficacy that, in principle, could result in more efficient interventions in local problems, is the development of an intentional semi-formal organization, such as a neighborhood watch or vigilante group. Here, in contrast to social capital produced through positive externalities from reciprocated exchange, social capital in the form of an organization is created intentionally for facilitating purposive collective action. The organization produces a public good, which is available to a “wider range of actors than those who initiated it” (Coleman 1990:313). For those neighborhoods with strong neighborhood associations, voluntary groups, or homeowners associations, when serious problems of local problems of crime and safety arise, the existing organization can be used to address the new problems. Such associations already have social ties and obligations among members,

mechanisms for attaining a working consensus, rudimentary role specialization (e.g., a precinct captain, treasurer, information specialist, and membership director), and rudimentary authority structure. Neighborhoods lacking such associations must create neighborhood watches—associations intended to reduce local crime— from scratch when confronted with problems of safety. Neighborhood watches tend to mimic other neighborhood watches, many of which are sponsored by local law enforcement, through the well-known process of institutional isomorphism (DiMaggio and Powell 1983). Successful neighborhood watches are those that move beyond mimicking stereotypical models and respond flexibly to the problem at hand, given constraints on resources available. Here, weak ties beyond the local neighborhood may provide new ideas, strategies, and ways of translating exigent resources into workable solutions to local problems. The mere existence of a neighborhood watch does not necessarily reflect high social capital or a high degree of collective efficacy. Typically, residents create such associations as a response to extreme spikes in the crime rate or a series of heinous criminal acts in the neighborhood. Such associations may function more to provide a cathartic outlet for frustrated residents, induce a feeling that something is being done, and create a symbol of success than to reduce the source of neighborhood problems. The key to success is the strength of other forms of social capital in the neighborhood—obligations and expectations, closure of social structures, norms of monitoring and sanctioning—which constitute the bedrock of any collective neighborhood action. In the absence of such foundational structures, a neighborhood watch will face an uphill battle to organize new forms of social capital from scratch.

In sum, by beginning with a rational choice model of individual action, we can specify micro-foundations for collective efficacy. Doing so helps bring the actor—and by implication, human agency, back into models of informal social control. It also potentially provides points of

public policy intervention. For example, it may be more efficient to increase collective efficacy by targeting concrete interactions by concrete individuals, rather than trying to influence a neighborhood or collectivity as a whole. Finally, it opens new directions for research, such as the identification of social processes leading to micro-to-macro transitions. We have not discussed the role that formal social control agencies play in neighborhood collective efficacy. It is likely that informal neighborhood control operates in the shadow of the legal system, that the threat of calling the police is used to strengthen informal interventions, and that neighborhoods vary substantially in the degree to which they are able to mobilize police. More work is needed to tease out these effects (e.g., Silver and Miller 2004).

ORGANIZATION IN FAVOR OF CRIME: THE PROTECTION RACKET

As a feature of social structure, social capital has the property of being available as a resource for achieving disparate objectives of a social group or collectivity. It follows that social organization created for one purpose can be “appropriated” and used for another purpose. To illustrate this property, Coleman (1990) uses the example of radical South Korean students who used study circles, based on existing social relationships from common membership in a church or hometown, to facilitate opposition to political authority without actually meeting in person. The study circles constitute a form of social capital “appropriated” for subversive activity. This property has two important implications. First, social capital, social organization, and social structure lack an inherent normative or moral imperative. Social capital is simply a resource that facilitates achieving a variety of goals. Social capital is neither inherently positive nor negative, and the term “negative social capital” (e.g., Portes 1998) is misleading; it is more accurate to say that social capital at times can facilitate action that is judged negative from the standpoint of a specific group or collectivity. What is important to examine empirically is the historically-specific ways in which social capital is used by groups and individuals to realize their interests. Second, social capital can facilitate criminal or deviant behavior. In the words of Portes (1998:18), “Mafia families, prostitution and gambling rings, and youth gangs offer so many examples of how embeddedness in social structures can be turned to less than socially desirable ends.”

I argue that social capital is an important feature of organization in favor of crime, which is actualized by motivated individuals seeking to realize their self-interest. I will examine a classic example of such social organization—the protection industry of the Sicilian Mafia (Gambetta 1993)—and show how self-interested individuals create social organization through a

micro-to-macro transition. I will show how rational choice can provide a micro-foundation for the genesis and operation of the code. Gambetta's (1993) analysis of the protection racket is rooted in a rational choice micro-foundation, and I show how he links rational choice to broader social organization.¹³

Supply and Demand for Protection in Southern Italy

Unlike most classical studies of organized crime, which examine the structure and function of the Mafia (e.g., Cressey 1969), the internal relations within a crime family (e.g., Ianni 1972), or the day-to-day operations of specific rackets (e.g., Reuter 1983), Gambetta (1993) analyzes the illegal market for protection, which he argues is the defining characteristic of the Sicilian Mafia. Stated from a macro-historical perspective, the demand for protection arose in Southern Italy due to the demise of feudalism, the transformation of property into a market commodity, and the inability of the state to define, protect, and enforce property rights. The result was a lack of trust in the state and a demand for private protection. At the same time, the breakup of the patrimonial system—in which noble landlords maintained private guards and semi-private police—created the supply of an unemployed class of skilled protectors who were being replaced by state-employed police. This confluence of demand and supply produced the protection racket (Gambetta 1993). Thus, in contrast to conventional cultural explanations of the rise of the Mafia, which argue that the subculture of organized crime that led inexorably to organized rackets is unique to Sicily, Gambetta's rational choice explanation eschews the central role of a unique and

¹³ A recent study by Hagan and Rymond-Richmond (2008, 2009) offers a fascinating analysis of how genocidal state systems arise from purposive action of individuals (Coleman's link 3). Using the concepts of collective action frames and social efficacy (Matsueda 2006), they show how individual racial epithets coalesce into a "collectivized racial intent" that mobilizes groups as well as the state into genocidal victimization (Hagan and Rymond-Richmond 2009). Such collective action is an example of organization in favor of crime (see Matsueda 2009).

nebulous culture. Any test of his proposition requires comparative research in which similar conditions of supply and demand arise within different historical junctures.

In his study of corruption and organized crime in Russia during the transition from communism to a market economy, Varese (1994, 2001) applies Gambetta's model to the rise of the Russian Mafia. Varese finds that, under communism during the Soviet period, the means of production were monopolized by the state, which precluded any demand for, or supply of, private protection. During the pre-Gorbachev era, there was rampant organized corruption among officials, but not structures like the Mafia. The economic reforms of 1986, however, produced an explosion of property owners and private transactions, which outstripped the development of effective legislation to define and protect private property rights. The resulting vulnerability of property owners to theft and fraud created a demand for private protection. As in the Sicilian case, in Russia, a supply of potential protectors coincided with this demand, as a pool of dismissed KGB, soldiers from the army, and police began to grow (Varese 1994:194). Members of this pool were skilled at the use of force, the necessary resource for participating in private protection. Varese concludes that the transition to a market economy in Russia created supply and demand for private protection and explained the rise of the Russian Mafia in a way that parallels the Sicilian case.

But what are the specific causal mechanisms linking this macro-historical explanation to individual action? Gambetta (1993) assumes rational actors, and shows how information asymmetries are overcome to produce a stable market for Mafia protection. His explanation draws heavily on economists' work on the market for lemons.

The Market for Lemons

I begin with a brief description of the negative effects of asymmetric information on markets and potential responses to those effects. In a landmark paper in economics, George Akerlof (1970) describes the role of asymmetric information (over uncertainty about quality of goods) in the market for “lemons.” Employing the example of the used car market, Akerlof begins with the assumption that there are good cars and lemons. Buyers in this market, lacking information on specific cars, cannot distinguish good cars from lemons. Owners of cars, however, after a period of time, gain information about the quality of their cars, and update their subjective probability that a car is a lemon through Bayesian learning. At this point, there is an asymmetry of information: the owner (potential seller) has more relevant information than the buyer. Because buyers cannot distinguish good cars from bad, they will rationally make the “best guess” that the car is of average quality and make a corresponding average offer. Therefore, an owner of a good car cannot get the true value of his car, and, being a rational actor, takes the car off the market. Buyers revise their estimates of average quality downward and make lower offers, which drives out sellers of moderate cars, until the market collapses. Akerlof (1970:490-492) derives supply and demand based on utility theory and shows that, under these conditions of asymmetric information, no cars will be sold.

Akerlof (1970) identifies several “counteracting institutions” that can reduce quality uncertainty, including the use of seller guarantees, in which the seller shares the burden of risk, and the use of brand names, which signal the quality of the good to buyers. The latter point is further developed by Spence (1973) in his theory of job market signaling as a solution to information asymmetries in the labor market. Here the problem is that employers are willing to pay higher wages for good workers, but cannot distinguish good workers from bad. This is not a problem for bad workers, who can free ride on the productivity of good workers. But good

workers want to be paid for their higher productivity. They therefore invest in educational credentials to signal to employees that they are good workers. For this signal to succeed, credentialing must be positively correlated with productivity, which is precisely the case: the costs of obtaining a credential is lower for high ability individuals because their skills will make them more productive workers, as well as allow them to succeed scholastically with less time and effort. Employers, then, use education credentials as a signal of future productivity over and above the role of education in increasing human capital.

Asymmetric Information and Signaling in Protection Rackets

Gambetta (1993) shows that both asymmetric information and signaling are crucial mechanisms in markets for Mafia protection. Broadly speaking, the key contextual element is trust. In free markets, the state protects individual rights, including rights of property and market exchange. The protection of those rights is public and universal, which, in conjunction with the institutional arrangements of markets, creates an environment of trust among actors. In perfectly-competitive markets, equilibrium price, a macro-level outcome, exists when prices have been adjusted so that demand equals supply of goods. In an environment of distrust, this model breaks down. Distrust inevitably arises when the state outlaws a certain commodity or exchange of goods, forcing exchange to occur outside the purview of a conventional market and its institutionalized arrangements of trust. The result is a demand for privatized protection by third-parties. Buyers pay the Mafia to protect themselves against being cheated or sold lemons; sellers pay for protection against buyers failing to pay on time or at all. Sellers may also be purchasing protection against themselves—to ensure that they not yield to the temptation of cheating the

seller and thereby soiling their own reputations. Thus, the seller's payment to the Mafia "would reflect the price he is prepared to pay to be trusted by the customer" (Gambetta 1993:21).

Members of the Mafia are frequently observed doing favors for local residents—helping to solve local disputes, returning a stolen good, redressing a wrong—without compensation. Such activity is a way of creating social capital, inducing an unpaid obligation to be fulfilled at a later time, and disseminating information about the Mafia's ability to deliver (a form of free advertising). In this way, the Mafiosi help create demand for their services (Gambetta 1993). This is also found in housing projects among drug dealers seeking to corporatize: they do residents uncompensated favors, showing that they can deliver services that housing authorities cannot, which helps create a demand for their services and protect their illicit activities, as residents gain an incentive to look the other way (Venkatesh 2000).

Transactions involving protection have both positive and negative externalities, which each tend to increase the rate of protection in the system. Protection has a public goods aspect produced through a positive externality. Mafia protection of one business on a street will protect other businesses on that street, which each have an incentive to free ride. Similarly, Mafia protection of a few sellers in a market will deter buyers from cheating because, lacking perfect information, they cannot fully distinguish the protected from the unprotected. In each case, the Mafia has an incentive to tax free riders using the threat of violence to collect (Gambetta 1993), and perhaps an incentive to provide signals of invulnerability for the protected. Protection transactions also create negative externalities for those who lack protection, as predators will target the unprotected, increasing demand for protection, until everyone is protected.

But not everyone is protected. The Mafia has strong disincentives to protect all sellers, because, while it would maximize their cut from sellers, it would simultaneously transform

protection into a public good, creating a conventional market in which buyers purchase goods based on price, quality, and taste. Gambetta (1993) identifies two problems facing the Mafia that would arise from universal protection. The first is the problem of scale. If protection were a public good, sellers would have an incentive to evade taxes. If all sellers were protected, the sheer size of the protected business would prevent the Mafia from enforcing collection of their cut (allowing tax evasion). The problem of scale would also make it difficult to monitor and sanction all transactions against lemons, and each undetected lemon sold would degrade the Mafia's reputation. The second is the problem of information. If the Mafia guaranteed all transactions, a given instance of protection would not be linked to a specific transaction and a buyer might think he got a good deal not because of the Mafia's protection, but rather because of "the independent honesty of the seller, which might foster the development of trust directly between the buyer and seller and put the mafioso out of business" (Gambetta 1993:23). Therefore, despite the unlimited demand for protection, the Mafia will only selectively protect a finite number of sellers.

Mafia Resources: Information, Violence, and Reputation

In providing protection, the Mafia rely on three key resources—information, violence, and reputation. Information, a basic form of social capital, is a key resource for the Mafia. To make protection work, the Mafia must know how reliable a seller is, know whether other Mafia are involved, and have information useful for blackmailing a seller in case they renege. Moreover, Mafia reputations are largely built on their ability to gather pertinent information on a client and other parties to guarantee that they can keep all parties in line. For example, by knowing their clients' location and the location of their clients' property, the Mafia is able to inflict punishment

for defaulting—and deliver protection (Gambetta 1993:36). Obtaining such information, in turn, relies on bridging and bonding social ties. Information is easily secured over a relatively small familiar territory—for example, where one grew up—where existing network ties, outstanding obligations, and local knowledge can be relied upon. At times, however, as Granovetter (1973) has famously argued, weak ties between disparate groups may produce information otherwise not known in local groups (see Matsueda 2006). Instrumental manipulation of information can also facilitate the protection racket. For example, the Mafia has an incentive to maintain secrecy over information that increases the vulnerability of Mafia members to retaliation. When a client defaults, the Mafia has an incentive to make public strategic information on clients that is punitive in itself.

The use of violence or the threat of violence is so ubiquitous that some scholars have included violence in its definition of organized crime (e.g., Cressey 1969). Violence is used to enforce sanctions, and therefore, the physical and psychological strength necessary to inflict violence is a critical resource for the Mafia. Why is violence so pervasive in organized crime? Gambetta (1993) is able to answer this question without making it true by definition. There are two parts to this explanation. First, when a state outlaws a good or service, it necessarily threatens violators with the deliberate imposition of state-legitimated pain and suffering. Therefore, the market for the good selects for ruthless, tough, and malevolent dealers who are unafraid of violence. To succeed in the protection racket, organized crime figures must be willing to resort to greater violence and ruthlessness than the dealers they will be policing. If unwilling, they will be inefficient in delivering protection, will lose market share, and will eventually be selected out of the market in favor of more efficient (violent) firms. Second, from the standpoint of an evolutionary model of the protection market, regardless of initial conditions,

the market will select for increasingly violent protectors. Violence is a zero-sum game in which victory not only delivers the goods, but also provides free advertising to non-protected agents. To succeed, any new competitor entering the market must be at least as violent and ruthless as established competitors, since new competitors not only have to resort to established levels of violence to sanction defaulters, but must also be willing to use greater violence against competitors to secure a market niche. As more violent and ruthless protectors enter the market, surviving protectors must ramp up their violence to remain competitive regardless of their personal views toward violence (Gambetta 1993). Thus, there is a long-term structural tendency for violence to increase.

Violence is essential for providing protection services; it is also a key component of a Mafia's reputation. Generally speaking, reputation or honor is earned by delivering promised protection, which implies keeping promises, using information effectively, and resorting to violence when necessary. According to Gambetta (1993), reputation for the Mafia, as in all businesses, is an asset that exempts the firm from having to prove quality and reliability in every transaction, and also helps shelter them from competition from new firms. Unlike other businesses, for the Mafia, reputation also reduces costs of production: the stronger the reputation, the less likely the Mafia will have to use up resources, such as violence, to guarantee protection and maintain the reputation.

Periodic demonstrations of violence reinforce the Mafia's reputation, but even in the absence of such demonstrations, reputations persist because customers are unlikely to challenge them due to the high costs of violence. This creates opportunities and incentives for fraud by outsiders—posing as a Mafia member and reaping the rewards of feigned protection. Consequently, Mafia members and their clients develop complex signals of authenticity that are

difficult to pirate, and posers respond by trying to decipher and mimic the signals (Gambetta 1993:45).

To explore this point, Smith and Varese (2001) develop a game theoretic model of repeated interactions between Mafia and clients or entrepreneurs. They find that entrepreneurs try to filter out fakers by periodically withholding payment, but that means at times the real Mafia occasionally go unpaid, causing the Mafia to inflict punishment to protect their reputation, punish non-payers, and drive out the fakers. Once Mafia reputations are restored, fakers again have an incentive to pose as Mafia. The result is a turbulent world in which filtering and violence persist. Interestingly, when police increase their presence, sporadic violence may rise in the short term—under police scrutiny, the Mafia must reduce demands and increase punishment if they are expected to be paid. In the long term, however, high levels of police presence allow entrepreneurs to refuse payment for protection, ultimately putting the Mafia out of business.

In sum, demand for a market of protection by organized crime is created in an environment of distrust between buyers and sellers, such as when illegal goods and services are being exchanged. Thus, a simple three-party exchange between buyers, sellers, and protectors, involving the strategic use of resources such as information, reputation, and the capacity for violence produces Mafia protection, which overcomes the context of distrust and facilitates the exchange of illicit goods. Moreover, these micro-level exchanges produce macro-level outcomes, such as a market for protection with an equilibrium rate of protective transactions, a high level of turbulence, a high level of violence by the Mafia, and stable levels of lemons sold.

Finally, a remarkable feature of the protection market is that the demand for protection—resulting from the production of distrust—is created endogenously as a by-product of the market. In other words, the total number of lemons will increase as the Mafia's effective protection

increases. In conventional markets, sellers seek to attract repeat customers by behaving honestly and maintaining a good reputation. But when protected by the Mafia, the seller's disincentive to sell a lemon to an unprotected outside buyer is diminished: (1) the seller, protected by the Mafia, is immune from punishment by the buyer; and (2) if the seller loses the unprotected customer (and perhaps others who hear about the lemon) he still retains his protected customers. The greater the number of protected buyers, the lower the cost of selling lemons to outsiders and consequently, the more lemons sold to outsiders. The result is more lemons sold and, therefore, an increased demand for protection. This implies that, in this context, "norms of good behavior will not evolve from an economic interest in keeping promises and acquiring an honest reputation" as Hume (1874:290) suggested, because the incentives for maintaining an honest reputation have been weakened by protection (Gambetta 1993:28). Indeed, according to Gambetta (1993), an oppositional norm may develop which praises and encourages the ability to cheat.

SUMMARY AND CONCLUSIONS

In this chapter, I have tried to show the utility of rational choice theory, not only as a theory of individual criminal behavior consistent with the behavioral assumptions underlying Anglo-Saxon legal systems, but also as a micro-foundation for macro-structural theories of crime rates. I began by reviewing empirical research on the deterrence question using statistical models, which generally shows consistent but modest effects of deterrence as well as rewards to crime. I then argued that rational choice can provide a micro-foundation for macro-level theories of organization against crime and organization in favor of crime. I showed that explanations of macro-level phenomena, such as neighborhood collective efficacy and organized crimes of the Mafia, which are often explained by purely structural or cultural theories, can be enriched by recognizing that they are rooted in individual purposive action. Grounding macro-processes in rational action overcomes the teleological problem of purely macro-level theories, provides an explanation compatible with the utilitarian underpinnings of the legal system, and may furnish efficient points of intervention by targeting individuals' agency, their embeddedness in social context, and the complex ways they produce social structure.

The examples used to illustrate these points are rooted in empirical research using both qualitative and quantitative methods. Each is essential for future research on multi-level research on crime. Qualitative research is necessary to identify the perceived opportunities and costs and returns to crime, which may be local to communication groups and subcultures. Quantitative research is necessary to identify structural patterns across individuals, identify network structure, and, after identifying pertinent perceived incentives, subject rational choice models to empirical test. Another useful tool for analyzing rational decisions—mentioned above with reference to

organized crime—is game theory, the application of mathematical models to strategic situations in which individual decision-making is dependent on the decisions of others.

In framing examples of social organization implicated in criminal processes, I used the concept of differential social organization as a framework that treats organization in favor of crime and organization against crime as analytically separate phenomena. But clearly, the process is more complicated, as anti-criminal organization and criminal organization are typically interwoven into a single fabric of social structure that evolves slowly over time (Matsueda 2006). For example, Anderson (1999) shows how the code of the street—a system of informal norms and sanctions concerning violence operating on inner-city streets—is known and used instrumentally to maintain one’s reputation on the street among street youth and decent youth alike. Moreover, as noted earlier, forms of social structure used for strictly legal purposes can be co-opted and used for illegal objectives, and vice versa. Research is needed to identify the dynamic interrelationships between conventional and illicit organization, how they mutually unfold over time, how they conflict and compete for resources, and how one may be co-opted by the other. For example, above I noted that the Mafia and some corporatist gangs use their social networks, threats of violence, and other resources to control predatory victimization of local residents, when such victimizations impede the gang’s illicit pecuniary activity. Criminal organizations frequently attempt to nullify the legal system by buying off public officials, a rational response to their illicit businesses, and at times a rational response from the standpoint of the public officials. More subtly, residents will often tolerate illegal activity, such as drug dealing, when it is in their rational interest to do so, because they gain stability and social control against indiscriminate violence by drug dealing gangs (see Patillo-McCoy 1999; Venkatesh 2000). Research into such relationships will likely show that criminal and anti-criminal

organizations often evolve according to a dialectical logic. Identifying the interdependencies that drive such a dialectical relationship is consistent with the thesis of this paper. That is, the interdependencies will be rooted in rational action that creates and recreates social organization and social structure in which that action is embedded.

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REFERENCES

- Akerlof, George A. 1970. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics* 84: 488-500.
- Alexander Jeffrey C., Bernhard Giesen, Richard Münch, and Neal J. Smelser. 1987. *The Micro-Macro Link*. Berkeley, CA: University of California Press.
- Anderson, Elijah. 1999. *Code of the Street: Decency, Violence and the Moral Life of the Inner City*. New York: W. W. Norton.
- Anwar, Shamena, and Thomas A. Loughran. 2011. "Testing a Bayesian Learning Theory of Deterrence among Serious Juvenile Offenders." *Criminology* 49:667-698.
- Bachman, Ronet, Raymond Paternoster, and Sally Ward. 1992. "Rationality of Sexual Offending: Testing a Deterrence/Rational Choice Conception of Sexual Assault." *Law and Society Review* 26: 343-372.
- Bandura, Albert. 1986. *Social Foundations of Thought & Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.
- _____. 1997. *Self Efficacy: The Exercise of Control*. New York: W. H. Freeman.
- Beccaria, Cesare. [1764] 1963. *On Crimes and Punishments*. Indianapolis: Bobbs-Merrill.
- Becker, Gary S. 1968. "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76:169-217.
- _____. 1996. *Accounting for Tastes*. Cambridge, MA: Harvard University Press.
- Becker, Gary S., and K.M. Murphy. 1988. "A Theory of Rational Addiction." *The Journal of Political Economy* 96: 675.
- Becker, Gary S., Grossman, Michael and Murphy, Kevin M. 1994. "An Empirical Analysis of Cigarette Addiction." *The American Economic Review* 84:396-418

- Bentham, Jeremy. [1789] 1948. *An Introduction to the Principle of Morals and Legislations*.
Oxford, UK: Blackwell.
- Blau, Peter M. 1964. *Exchange and Power in Social Life*. New York: Wiley.
- Bourdieu, Pierre. 1986. "The Forms of Social Capital." In *Handbook of Theory and Research for the Sociology of Education*. Greenwood Press.
- Brock, William A., and Steven N. Durlauf. 2001. "Interactions-Based Models." Pp. 3297-3380 in *Handbook of Econometrics*, edited by J. J. Heckman and E. Leamer, New York: Elsevier Science.
- Buchanon, James M. 1965. "An Economic Theory of Clubs." *Economica* 32:1-14.
- Bueno De Mesquita, Bruce, and Lawrence E. Cohen. 1995. "Self-Interest, Equity, and Crime Control: A Game-Theoretic Analysis of Criminal Decision Making." *Criminology* 33:483-518.
- Bursik, Robert J. 1988. "Social Disorganization and Theories of Crime and Delinquency: Problems and Prospects." *Criminology* 26:519-552.
- Chaloupka, Frank J., Rosalie Liccardo Pacula, Matthew C. Farrelly, Lloyd D. Johnston, and Patrick M. O'Malley. 1999. "Do Higher Cigarette Prices Encourage Youth to Use Marijuana?" NBER Working Paper, No. W6939. Cambridge, MA.
- Clarke, Ronald V. and Derek B. Cornish. 1985. "Modeling Offenders' Decisions: A Framework for Research and Policy." Pp. 147-185 in *Crime and Justice: An Annual Review of Research, Volume 6*, edited by N. Morris and M. Tonry. Chicago: University of Chicago Press.
- Clear, Todd R. 2007. *Imprisoning Communities: How Mass Incarceration Makes Disadvantaged Neighborhoods Worse*. New York, NY: Oxford University Press.

- Coleman, James S. 1983. "Microfoundations and Macrosocial Behavior." Pp. 153-173 in *The Microfoundations of Macrosociology*. Edited by M. Hechter. Philadelphia, PA: Temple University Press.
- _____. 1986. "Social Theory, Social Research, and a Theory of Action." *American Journal of Sociology* 6:1309-1335.
- _____. 1988a. "Free Riders and Zealots: The Role of Social Networks." *Sociological Theory* 6:52-57.
- _____. 1988b. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94: S95-S120.
- _____. 1990. *Foundations of Social Theory*. Cambridge, MA: Harvard.
- Cornish, Derek B., and Ronald V. Clarke (Eds). 1986. *The Reasoning Criminal: Rational Choice Perspectives on Offending*. New York, NY: Springer-Verlag.
- Cressey, Donald R. 1969. *Theft of the Nation*. New York: Harper and Row.
- DiMaggio, Paul J, and Walter W. Powell. 1983. "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields." *American Sociological Review* 48:147-160.
- Dominitz, Jeff, and Charles F. Manski. 1997. "Using Expectations Data to Study Subjective Income Expectations." *Journal of the American Statistical Association* 92:855-867.
- Durlauf, Steven N., and Marcel Fafchamps. 2005. "Social Capital. Pp. 1640-1699 in *Handbook of Economic Growth*, Volume 1B. Edited by P. Aghion and S. N. Durlauf. Amsterdam: Elsevier.
- Durlaf, Steven N., and Daniel S. Nagin. 2011. "Imprisonment and Crime: Can both be reduced?" *Criminology and Public Policy* 10:13-54.

- Ehrlich, Isaac. 1973. "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation." *Journal of Political Economy* 81:521-565.
- Elster, Jon. 1997. "'More than Enough': A Review of Becker's *Accounting for Taste*." *University of Chicago Law Review* 64:749-64.
- _____. 2003. "Coleman on Social Norms." *Revue française de sociologie* 44:297-304.
- Epstein, Larry G. 1999. *Review of Economic Studies* 66:579-608.
- Farrelly, Matthew C., Jeremy W. Bray, Gary A. Zarkin, and Brett W. Wendling. 2001. "The Joint Demand for Cigarettes and Marijuana: Evidence from the National Household Surveys On Drug Abuse." *Journal of Health Economics* 20: 51-68
- Friedman, Milton. 1953. "Choice, Chance, and the Personal Distribution of Income." *The Journal of Political Economy* 61:277-290.
- Gambetta, Diego. 1993. *The Sicilian Mafia: The Business of Private Protection*. Cambridge, MA: Harvard University Press.
- Giordano, Peggy C., Stephen A. Cernkovich, and Jennifer L. Rudolph. 2002. "Gender, Crime, and Desistance: Toward a Theory of Cognitive Transformation." *American Journal of Sociology* 107:990-1064.
- Glaeser, Edward L., David Laibson, Bruce Sacerdote. 2002. "An Economic Approach to Social Capital." *The Economic Journal* 112: F437-F458.
- Gottfredson, Michael R., and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford University Press.
- Granovetter, Mark. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78:1360-1380.

- _____. 1985. "Economic Action and Social Structure: The Problem of Embeddedness."
American Journal of Sociology 91:481-510.
- Grossman, Michael, and Frank J. Chaloupka. 1998. "The Demand For Cocaine by Young Adults: A Rational Addiction Approach." *Journal of Health Economics* 17: 427-474.
- Gruber, Jonathan, and Botond Köszegi. 2001. "Is Addiction Rational? Theory and Evidence."
Quarterly Journal of Economics 116:1261-1303.
- Hagan, John and Bill McCarthy. 1998. *Mean Streets: Youth Crime and Homelessness*.
Cambridge, UK: Cambridge University Press.
- Hagan, John, and Wenona Rymond-Richmond. 2008. "The Collective Dynamics of Race and Genocide Victimization in Darfur." *American Sociological Review* 73:875-902.
- Hagan, John, and Wenona Rymond-Richmond (2009) *Darfur and the Crime of Genocide*.
Cambridge, UK: Cambridge University Press.
- Hagan, John, Hans Merckens, and Klaus Boehnke. 1995. "Delinquency and Disdain: Social Capital and the Control of Right-Wing Extremism among East and West Berlin Youth."
American Journal of Sociology 100:1028-1052.
- Hechter, Michael. 1987. *Principles of Group Solidarity*. Berkeley, CA: University of California Press.
- _____, Ed. 1983. *The Microfoundations of Macrosociology*. Philadelphia, PA: Temple University Press.
- Hechter, Michael, and Karl-Dieter Opp, Eds. 2001. *Social Norms*. New York, NY: Russell Sage.
- Hechter, Michael, and Satoshi Kanazawa. 1997. "Sociological Rational Choice Theory."
Annual Review of Sociology 23:191-214.

- Heckathorn, Douglas D. 1988. "Collective Sanctions and the Creation of Prisoner's Dilemma Norms." *American Journal of Sociology* 94:535.
- Huber Joan, ed. 1991 *Macro-Micro Linkages in Sociology*. Newbury Park, CA: Sage
- Hume, David. 1874. *Treatise on Human Nature*. Vol. 2. Edited by T. H. Green and T. H. Grose. London: Longmans, Green, and Co.
- Ianni, Francis A. J. and Elizabeth Reuss Ianni. 1972. *A Family Business: Kinship and Social Control in Organized Crime*. New York, NY: Russell Sage
- Kahneman, Daniel, Peter P. Wakker, and Rakesh Sarin. 1997. "Back to Bentham? Explorations of Experienced Utility." *The Quarterly Journal of Economics* 112:375-405.
- Kelling, George L., and Catherine M. Coles. 1997. *Fixing Broken Windows: Restoring Order and Reducing Crime in Our Communities*. New York: Simon and Schuster.
- Kitts, James A. 2006. "Collective Action, Rival Incentives, and the Emergence of Antisocial Norms." *American Sociological Review*, 71:235-259.
- Klepper, Steven and Daniel S. Nagin. 1989. "The Deterrent Effect of Perceived Certainty and Severity of Punishment Revisited." *Criminology* 27:721-746.
- Kollock, Peter. 1998. "Social Dilemmas: The Anatomy of Cooperation." *Annual Review of Sociology* 24:183-214.
- Kornhauser, Ruth Rosner. 1978. *Social Sources of Delinquency: An Appraisal of Analytic Models*. University of Chicago Press.
- Lederman, Daniel, Norman Loayza, and Ana María Menéndez. 2002. "Violent Crime: Does Social Capital Matter?" *Economic Development and Cultural Change* 50:509-539.
- Levitt, Steven. 1997. "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime." *American Economic Review* 87:270-90.

- Lochner, Lance. 2007. "Individual Perceptions of the Criminal Justice System." *American Economic Review* 97:444-460.
- Maestro, Marcello T. 1973. *Cesare Beccaria and the Orgins of Penal Reform*. Philadelphia: Temple University.
- Manski, Charles F. 1990. "The Use of Intentions Data to Predict Behavior: A Best Case Analysis." *Journal of the American Statistical Association* 85:934-940.
- Massey, Douglas S. and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.
- Matsueda, Ross L. 2006. "Differential Social Organization, Collective Action, and Crime." *Crime, Law and Social Change* 46:3-33.
- Matsueda, Ross L. 2009. "Toward a Criminology of Genocide: Theory, Method, and Politics." *Theoretical Criminology* 13:495-502.
- Matsueda, Ross L., Derek A. Kreager, and David Huizinga. 2006. "Deterring Delinquents: A Rational Choice Model of Theft and Violence." *American Sociological Review* 71:95-122.
- McAdams, Richard H. 2009. "Beyond the Prisoners' Dilemma: Coordination, Game Theory, and Law." *Southern California Law Review* 82:209-258.
- McCarthy, Bill. 1995. "Not Just 'For the Thrill of it': An Instrumentalist Elaboration of Katz's Explanation of Sneaky Thrill Property Crimes." *Criminology* 33:519-538.
- McCarthy, Bill. 2002. "New Economics of Sociological Criminology." *Annual Review of Sociology* 28:417-42.
- McCrary, Justin. 2002. "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime: Comment." *The American Economic Review* 92 (4): 1236-1243.

- Mead, George Herbert. 1934. *Mind, Self, and Society: From the Standpoint of a Social Behaviorist*. Edited by C. W. Morris. Chicago, IL: University of Chicago .
- Merry, Sally Engel. 1984. "Rethinking Gossip and Scandal." Pp 271-302 in *Toward a General Theory of Social Control*, Vol. II. Edited by D. Black. New York: Academic Press.
- Merton, Robert K. 1936. "The Unanticipated Consequences of Purposive Social Action." *American Sociological Review* 1: 894-904.
- Merton, Robert K. 1957. *Social Theory and Social Structure*. Revised and enlarged edition. New York: Free Press.
- Messner, Steven F., Eric P. Baumer, and Richard Rosenfield. 2004. "Dimensions of Social Capital and Rates of Criminal Homicide." *American Sociological Review* 69:882-903.
- Morenoff, Jeffrey D., Robert J. Sampson, and Stephen W. Raudenbush. 2001. "Neighborhood Inequality, Collective efficacy, and the Spatial Dynamics of Homicide." *Criminology* 39:517-60.
- Nagin, Daniel S. 1978. "General Deterrence: A Review of the Empirical Evidence." in *Deterrence and Incapacitation: Estimating the Effects of Criminal Sanction on Crime Rates*, edited by A. Blumstein, J. Cohen, and D. S. Nagin. Washington, D.C.: National Academy Press.
- Nagin, Daniel S. 1998. "Criminal Deterrence Research at the Outset of the Twenty-First Century." *Crime and Justice: A Review of Research* 23:1-42.
- Nagin, Daniel S., and Raymond Paternoster. 1994. "Personal Capital and Social Control: The Deterrence Implications of Individual Differences in Criminal Offending." *Criminology* 32:581-606.

- Olson, Mancur. 1971. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge, MA: Harvard University Press.
- Pacula, Rosalie Liccardo, Michael Grossman, Frank J. Chaloupka, Patrick M. O'Malley, Lloyd D. Johnston, and Matthew C. Farrelly. 2000. "Marijuana and Youth." NBER Working Paper, No. W7703. Available at SSRN: <http://ssrn.com/abstract=232087>.
- Pager, Devah. 2007. *Marked: Race, Crime, and Finding Work in an Era of Mass Incarceration*. Chicago, IL: University of Chicago Press.
- Paternoster, Raymond. 1987. "The Deterrence Effect of the Perceived Certainty and Severity of Punishment: A Review of the Evidence and Issues." *Justice Quarterly* 4:173-217.
- Paternoster, Raymond, and Sally Simpson. 1996. "Sanction Threats and Appeals to Morality: Testing a Rational Choice Theory of Corporate Crime." *Law and Society Review*. 30:549-583.
- Patillo-McCoy, Mary. 1999. *Black Picket Fences: Privilege and Peril Among the Black Middle Class*. Chicago, IL: University of Chicago Press.
- Piliavin, Irving, Rosemary Gartner, Craig Thornton, and Ross L. Matsueda. 1986. "Crime, Deterrence, and Rational Choice." *American Sociological Review* 51:101-119.
- Pogarsky, Greg, and Alex R. Piquero. 2003. "Can Punishment Encourage Offending? Investigating the "Resetting" Effect." *Journal of Research in Crime and Delinquency*. 40:95-120.
- Pogarsky, Greg, Alex R. Piquero, and Raymond Paternoster. 2004. "Modeling Change in Perceptions about Sanction Threats: The Neglected Linkage in Deterrence Theory." *Journal of Quantitative Criminology*.

- Portes, Alejandro. 1998. "Social Capital: Its Origins and Applications in Modern Sociology." *Annual Reviews in Sociology*, 24:1-24.
- Putnam, Robert D. 1995. "Tuning In, Tuning Out: The Strange Disappearance of Social Capital in America" *Political Science & Politics* 28: 664-683.
- Putnam, Robert D. 2001. *Bowling Alone: The Collapse and Revival of American Community*. New York, NY: Simon & Schuster.
- Quillian, Lincoln. 1999. "Migration Patterns and the Growth of High-Poverty Neighborhoods, 1997-1990." *American Journal of Sociology* 105:1-37
- Reuter, Peter. 1983. *Disorganized Crime: The Economics of the Visible Hand*. Cambridge, MA: MIT Press.
- Rosenfeld, Richard, Steven F. Messner, Eric P. Baumer. 2001. "Social Capital and Homicide" *Social Forces* 80:283-309.
- Rossi, Peter H., and Steven L. Nock. 1982. *Measuring Social Judgments: The Factorial Survey Approach*. Beverly Hills: Sage.
- Sampson, Robert J. and Jacqueline Cohen. 1988. "Deterrent Effects of Police on Crime: A Replication and Theoretical Extension." *Law and Society Review* 22:163-89.
- Sampson, Robert J. and John H. Laub. 1993. *Crime in the Making: Pathways and Turning Points Through Life*. Cambridge, MA: Harvard University Press.
- Sampson, Robert J., Jeffrey D. Morenoff, and Felton Earls. 1999. "Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children." *American Sociological Review* 64: 633-60.

- Sampson, Robert J., Jeffrey D. Morenoff, and Thomas Gannon-Rowley. 2002. "Assessing 'Neighborhood Effects': Social Processes and New Directions in Research." *Annual Review of Sociology* 28:443-478
- Sampson, Robert J. and Stephen W. Raudenbush. 1999. "Systematic Social Observation of Public Spaces: A New Look at Disorder in Urban Neighborhoods." *American Journal of Sociology* 105:603-51.
- Sampson, Robert J., Stephen W. Raudenbush and Felton Earls. 1997. "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." *Science* 277:918-24.
- Sampson, Robert J., and William J. Wilson. 1995. "Race, Crime and Urban Inequality." In *Crime and Inequality*, edited by J. Hagan and R. Peterson. Stanford: Stanford University Press.
- Sandler, Todd, and John Tschirhart. 1994. "Club Theory: Thirty Years Later." *Public Choice* 93:335-355.
- Sawyer, R. Keith. 2001. "Emergence in Sociology: Contemporary Philosophy of Mind and Some Implications for Sociological Theory." *American Journal of Sociology* 107: 551-585.
- Shaw, Clifford R. and Henry D. McKay. 1969 [1942]. *Juvenile Delinquency in Urban Areas*. Revised Edition. Chicago: University of Chicago Press.
- Silver, Eric, and Lisa L. Miller. 2004. "Sources of Informal Social Control in Chicago Neighborhoods." *Criminology* 42:551-583.
- Smith, Alastair, and Federico Varese. 2001. "Payment, Protection, and Punishment: The Role of Information and Reputation in the Mafia." *Rationality and Society* 13:349-393.
- Spence, Michael. 1973. "Job Market Signaling." *The Quarterly Journal of Economics* 87:355-374

- Sutherland, Edwin. 1947. *Principles of Criminology*. Fourth Edition. Philadelphia, PA: Lippincott.
- Swaray, Raymond B., Roger Bowles, and Rimawan Pradiptyo. 2005. "The Application of Economic Analysis to Criminal Justice Interventions: A Review." *Criminal Justice Policy Review* 16:141-163.
- Taylor, Ralph B. 1996. "Neighborhood Responses to Disorder and Local Attachments: The Systemic Model of Attachment, Social Disorganization, and Neighborhood Use Value." *Sociological Forum* 11:41-74.
- Thrasher, Frederic M. 1927. *The Gang*. Chicago: University of Chicago.
- Toch, Hans. 1969. *Violent Men*. Chicago: Aldine.
- Varese, Federico. 1994. "Is Sicily the Future of Russia? Private Protection and the Rise of the Russian Mafia." *European Journal of Sociology* 35:224-58.
- Varese, Federico. 2001. *The Russian Mafia: Private Protection in a New Market Economy*. Oxford, UK: Oxford University Press.
- Venkatesh, Sudhir. 2000. *American Project: The Rise and Fall of a Modern Ghetto*. Cambridge, MA: Harvard University Press.
- Von Neumann, John, and Oskar Morgenstern. 1944. *Theory of Games and Economic Behavior*. Princeton, NJ: Princeton University Press.
- Voss, Thomas. 2001. "Game-Theoretic Perspectives on the Emergence of Social Norms." Pp. 105-136 in *Social Norms*. Edited by M. Hechter and K. Opp. New York, NY: Russell Sage.
- Weber, Max. [1921/1922] 1978. *Economy and Society*. Edited by G. Roth and C. Wittich. Berkeley, CA: University of California Press.
- Western, Bruce. 2007. *Punishment and Inequality in America*. Cambridge, MA: Harvard University Press.

- Williams, Kirk R. and Richard Hawkins. 1986. "Perceptual Research on General Deterrence: A Critical Review." *Law and Society Review* 20:545-572.
- Wilson, James Q. and Barbara Boland. 1978. "The Effect of the Police on Crime." *Law and Society Review* 12:367-90.
- Wilson, William Julius. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.
- Zimring, Franklin, E., and Gordon J. Hawkins. 1973. *Deterrence*. Chicago: University of Chicago.

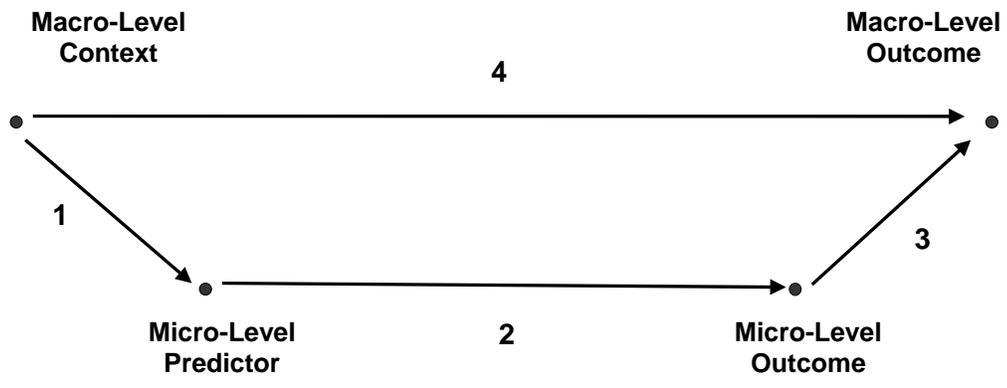


Figure 1. Links Between Micro- and Macro-Level Mechanisms. Source: Coleman (1990).

**Neighborhood
Structure**

4



Collective Efficacy

- **Child-Centered Social Control**
- **Intergenerational Closure**
- **Reciprocated Exchange**

Figure 2. Macro-Level Model of Neighborhood Structure and Collective Efficacy

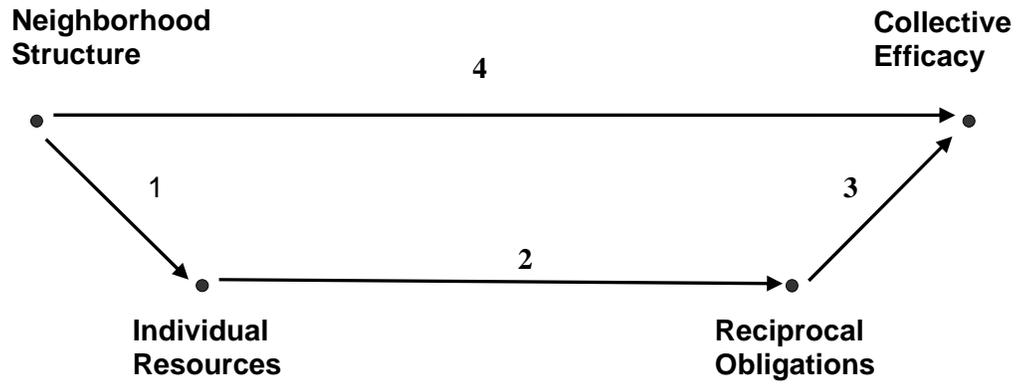


Figure 3. Macro-Level Model of Neighborhood Structure and Collective Efficacy with Links to a Micro-Level Model of Reciprocal Obligations