COLLECTIVE SECURITY AND THE OWNERSHIP OF FIREARMS FOR PROTECTION

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This paper examines the hypothesis that people purchase firearms for protection when confidence in collective institutions of justice and security declines. Analysis of survey data from Detroit indicates that gun ownership for protection is inversely related to confidence in the police and in the courts, and that these relationships are independent of demographic and socioeconomic variables and fear of crime.

The decision of citizens to acquire firearms for protection from crime is not only an important issue in the sociology of social control, but one with implications for general theories of collective action. Some of the theoretical links have been recently developed by McDowall and Loftin (1983), who argue that the threat of violent crime is a powerful incentive for individuals to abandon collective, institutionalized means for providing justice and security. According to their argument, the acquiescence of citizens to the collective provision of these fundamentals of community life (security and justice) does not come naturally or easily. Rather, it is tentative and requires a variety of social control mechanisms to restrain the inclination to resort to self-help. Consequently, when the effectiveness of institutional means are in doubt or when community controls are weakened, individualistic solutions become more prevalent.

The major prediction from the McDowall and Loftin model is that gun ownership for protection will increase as confidence in the strength of collectively provided security declines. This prediction is supported by their time-series data from Detroit showing that, net of other variables, handgun sales vary positively with violent crime and civil disorders, and negatively with the allocation of resources to the police.

Despite these findings, the collective security hypothesis remains controversial for two reasons. First, because the underlying theory is formulated in terms of individual behavior, McDowall and Loftin's city-level estimates may suffer from aggregation bias. Second, although no analysis of individual-level

data has directly examined the predictions of the collective security model, closely related studies of the relationship between gun ownership and crime concerns have produced inconclusive results.[1]

This paper describes an analysis of survey data from Detroit designed to provide a stronger test of the collective security model. The evaluation is more rigorous than that provided by earlier studies because it uses more direct measures of confidence in collective security and because it is based on individual-level data. Before describing the data analysis and findings in detail, it will be useful to review the major features of the collective security model.

THE COLLECTIVE SECURITY MODEL

In industrial societies, the provision of security and justice is accomplished primarily through collective mechanisms, such as publicly supported police departments and courts. Although the development of this pattern has been explained in various ways, it is generally agreed that the potential for interpersonal violence is reduced when security is provided by the community rather than by individuals or families (Maine, 1954; Sahlins, 1968). Thus, the collective provision of security is generally associated with the maintenance of social order.

Despite collective advantages, the provision of security by the community implies that individuals will be vulnerable to exploitation if the community effort fails. In fact, because collective security requires limiting the ability of individuals to provide for their own protection, failure of such efforts leaves individuals more vulnerable to victimization than might otherwise have been the case. The potential individual risk associated with collective security means that confidence in it is always tenuous and there are always incentives for individuals to arm themselves for protection.

The decision either to rely on collective security or arm oneself poses a quandry similar to that posed by the prisoner's dilemma game (Luce and Raiffa, 1957; Rapoport and Chammah, 1965; Schelling, 1982), which was originally described by Luce and Raiffa (1957: 95) as follows:

> Two subjects are taken into custody and separated. The district attorney is certain they are guilty of a specific crime, but he does not have adequate evidence to convict them at a trial. He points out to each prisoner that each has two alternatives: to confess to the crime the police are sure they have done or not to confess. If they both do not confess then the district attorney states that he will book them on some very minor, trumped-up charge . . . ; if they both confess, they will be prosecuted,

1. After a thorough review of the literature, Wright, Rossi, Daly, and Weber-Burdin conclude (1983: 101) "that there is *no* credible study *anywhere* in the literature that shows, clearly and unmistakably, [this type of an] effect . . . ."

> (and) he will recommend (a rather severe) sentence; but if one confesses and the other does not, then the confessor will receive rather lenient treatment for turning state's evidence whereas the latter will get the "book" slapped at him.

In the case of private citizens concerned about crime control, the cooperative response (relying on collectively supplied protection) may subject one to criminal exploitation if community institutions prove ineffective. In contrast, the "defecting choice" (arming oneself) may appear to reduce the risk of personal victimization, although it may also increase the collective risk of violence in the community.[2]

The version of the game that most closely resembles the protection dilemma outlined above produces what has been called the "isolation paradox" (Sen, 1967; Roemer, 1985). The isolation paradox exists to the extent that individuals are unable to trust others to cooperate. Where cooperation cannot be assumed, defection is the rational choice. An alternative strategy is derived from the assurance game (Sen, 1967; Roemer, 1985). To the extent that individuals can be assured that others will cooperate, through either internal or external sources of social control, cooperation becomes the optimal individual strategy.

With regard to gun ownership, however, the assurance of cooperation does not exist, for even if law-abiding citizens agreed to eschew self-protection in favor of collective security, who would be willing to trust criminals to do the same? Thus, in order to prevent mass arming on the part of the citizenry, assurance of cooperation from individuals must be replaced by a functional equivalent. Trust in the effectiveness of criminal justice institutions to exercise effective external social control would appear to represent such a functional equivalent. Individual armament is rendered less rational to the extent that confidence in the strength of collective security is maintained. If criminal justice institutions can be trusted to provide adequate protection, it is unnecessary to own private weapons for protection. In fact, because of the possibility of weapons thefts and accidental shootings, many of those who have confidence in criminal justice institutions may actually view ownership of private firearms as an unnecessary danger.

However, in the case of crime control and justice, where ultimate values are at risk, maintenance of confidence in community institutions is often analogous to preserving orderly egress from a building that is perceived to be burning. Crime is a major concern of many citizens who are exposed to a constant stream of news about criminal activities. Thus, institutional means of achieving cooperative behavior are subject to considerable stress and are

2. It is not necessary for either of these propositions to be true empirically. The argument rests only on the assumption that many people believe them to be true.

constantly in danger of failing to restrain the self-interests that motivate reliance on personally provided security. Nevertheless, the incentive to provide self-help should be minimized to the extent that citizens have confidence in the ability of the community to prevent crime and punish offenders.

The collective security model is generally consistent with the results of studies using aggregate data from city, state, and national levels. With a few exceptions, these studies find that gun sales and ownership rise with increases in violent crime and riots and fall with increased allocations to crime control institutions (Bordua and Lizotte, 1979; Clotfelter, 1981; Kleck, 1979; McDowall and Loftin, 1983; Seidman, 1975).

In contrast, studies using individual-level data, which have generally focused on the relationship between gun ownership and fear of crime, have produced highly variable estimates. In particular, analyses using the same survey instrument, the NORC General Social Survey, have produced estimates of the relationship between fear and gun ownership that cover the range from weak positive to strong negative (DeFronzo, 1979; Stinchcombe, Adams, Heimer, Scheppele, Smith, and Taylor, 1980; Williams and McGrath, 1978; Wright and Marston, 1975). More recently, General Social Survey data have been used to demonstrate that fear of crime influences ownership primarily through its interaction with other variables (Hill, Howell, and Driver, 1985; Young, 1986).[3] Further, in an analysis of survey data from Illinois, Lizotte and Bordua (1980) and Lizotte, Bordua, and White (1981) found that gun ownership for protection had a strong positive relationship with fear of crime, but that it was unrelated to perceptions of the crime rate.

Thus, although existing surveys do not provide consistent support for the collective security model, neither do they contain direct measures of the key concepts in the model (that is, confidence in institutional means of security). As measured in surveys, fear of crime is, at best, an indirect indicator of confidence in crime control institutions and is known to confound several quite different dimensions including anxiety about criminal assault and general concerns about moral and social standards (Garofalo and Laub, 1978). An adequate test of the collective security hypothesis requires more direct measures of confidence in crime control institutions. Such a model is specified and estimated in the following sections of the paper.

3. Although it is not completely clear why the effects are so elusive in the General Social Survey, the variability of the results is explained to some extent by the fact that different authors have used very different theoretical models. Bivariate analysis produced the negative relationships (Wright and Marston, 1975; Williams and McGrath, 1978); and a model which allowed for simultaneous determination of fear and gun ownership produced the weak positive effect (DeFronzo, 1979).

EMPIRICAL SPECIFICATION

The data for the analysis were drawn from the 1979 Detroit Area Study. Households within the three-county Detroit Metropolitan area were selected through the use of a stratified cluster sample; respondents were chosen randomly within households. The analysis was limited to adult white males, because race and sex have been shown to interact with other variables related to gun ownership (Hill et al., 1985; Lizotte and Bordua, 1980; McClain, 1983; Young, 1982), and because adult males are most likely to make the decision to acquire a gun. Moreover, there were too few black respondents in the sample to perform separate analyses for racial subgroups, and there was no way to determine whether the household respondent was in fact responsible for the decision to acquire firearms. In limiting the sample to adult white males, there is a tradeoff of external validity for internal validity. Although the results cannot be generalized to females or blacks, one can be more confident that the model is appropriate for the population studied. The overall sample generated 644 respondents, of whom 219 were adult white males.

A description of all the variables appearing in the analysis is presented in the Appendix. The dependent variable was derived from a question asking respondents whether anyone in the household owned a gun and, if so, whether it was intended for protection. Responses to this question were dichotomized on the basis of whether or not the respondents reported owning guns for protection.

There are three indicators of the respondents' opinions about community institutions of security and justice: (1) confidence in the police, (2) confidence in the courts, and (3) support for increasing police powers. All three indicators are composites derived from preliminary cluster and principal components analysis of variables measuring attitudes toward the crime control system. Both techniques identified three distinct groups of variables, which appeared to measure confidence that the police were providing adequate protection from crime, confidence that the courts were providing appropriately severe punishment for criminals, and support for increasing police discretionary powers. Indices for each group of variables were constructed by summing the scores of items which had a loading of .5 or more on a given principal component.

The two confidence indices consist of items reflecting the extent to which respondents are satisfied with the performance of the police and courts. Collective security implies that the community can provide justice and protection for its members, and the bulk of responsibility for these tasks rests with courts and police departments. Measures of confidence in the police and courts are therefore very direct indicators of the perceived level of security. It is expected that as confidence in the police or courts increases, the probability of owning a gun for protection decreases.

The third index, measuring support for increasing the powers of police in the pursuit of criminals, should have little direct bearing on perceptions of collective security. This index taps attitudes about civil liberties, and there is no reason to believe that perceptions of the strength of collective security will be related to such attitudes. Nevertheless, the police power index was included in the analysis as a check on the construct validity of the two confidence measures. To the extent that the confidence indices represent perceptions of collective security, rather than more general attitudes about the crime control system, they, rather than the police power index, should be related to gun ownership. The police power index therefore provides a way of assessing whether the other two indices actually measure what they are intended to measure.[4]

Finally, the analysis includes a number of social and demographic variables that may be related to gun ownership. For example, Lizotte et al. (1981) found that ownership for protection increased with age, while other studies found relationships between income and gun ownership (Hill et al., 1985; DeFronzo, 1979; Wright and Marston, 1975) and between education and gun ownership (Burr, 1977; Lizotte et al., 1981; Wright and Marston, 1975). Most of these relationships were quite weak, and the findings were not consistent from study to study. However, to take any influence of the demographic variables into account the respondents' ages, their years of education, and the natural logarithms of their incomes were also included in the model.

ESTIMATION AND FINDINGS

Estimates of the model are presented in Table 1. Because gun ownership is a binary variable, the model was estimated as a logistic equation, using maximum likelihood techniques. The logistic coefficients reported in the first column of the table may be interpreted as the effects of unit increases in the independent variables on the logarithm of the odds of owning a gun for protection.

Since the log odds metric lacks a comfortable substantive interpretation, the fourth column of Table 1 presents the effects of the independent variables on the probability of owning a gun for protection. The probabilities are a nonlinear function of the log odds. These effects, therefore, must be evaluated for a specific probability level. Effects are evaluated for respondents whose predicted probability of gun ownership is .50. Thus, the coefficients in the fourth column of the table represent the effects of a unit change in an independent variable in increasing or decreasing this probability.[5] The .50 probability was chosen because it estimates the effects of changes in perceived

4. For a general discussion of the use of this sort of strategy in the construction validation of composite scales, see Zeller and Carmines (1980).

5. These effects were calculated using a formula derived by Petersen (1985), who

Table 1. Logistic Estimates of Gun Ownership for Protection

Variable	Logistic Coefficient (B)	Standard Error (se)	Ratio B/se	Δ p (for p=.50)	Chi Square
Intercept	2.662	2.383	1.117		
Education	−0.028	−0.065	−0.423	−0.007	2.43
Income	0.210	0.350	0.600	0.053	.30
Age	0.000	0.014	0.233	0.001	.60
Police Confidence	−0.244	0.118	−2.074	−0.061	9.58
Courts Confidence	−0.400	0.141	−2.845	−0.100	4.29
Police Power	−0.065	0.083	−0.777	−0.016	.05
Perceived Crime	0.241	0.435	0.553	0.060	.36
Fear of Crime	0.066	0.043	1.553	0.017	.17

security among respondents who are expected to be least firmly committed to gun ownership one way or the other. That is, the .50 probability point represents a kind of "tipping point" in the decision to acquire a gun, and thus appears to be the most theoretically interesting point on the curve.[6]

The results presented in the table are highly consistent with the collective security model. In particular, both confidence in the police and confidence in the courts have large effects in the expected direction. Among respondents with a 50% chance of owning a gun for protection, each unit increase in the court index is expected to decrease the probability of gun ownership by about .10. The minimum value on this index was 0, and few scores were larger than 6.0. Individuals with the highest level of confidence in the courts would thus be about 60% less likely than those with the lowest levels of confidence to own a gun for protection.[7] Similarly, each unit increase in the police confidence index is expected to reduce the probability of protective gun ownership by about .06. The minimum and maximum scores on this index were 0 and 6.2, so those who were most confident in the police would be about 38% less likely to own a gun for protection than those who were the least confident.

As expected, the police power index is not related to protective gun ownership at conventional levels of statistical significance. This is evidence that the two confidence indices are not merely proxies for general authoritarian attitudes about crime control.

None of the demographic characteristics in the model have more than trivial effects on owning a gun for protection. The signs for income and age are both positive, and that for education is negative, in accordance with several past studies. But also in accordance with previous studies, the effects of these variables are extremely small, and none is statistically significant. This leads to the conclusion that, independent of confidence in collective security, the demographic characteristics of the respondents are of little importance in the decision to own a gun for protection.

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provides a more general discussion on the relationship between log odds and probabilities in logit models.

6. Evaluating the effects at .50 also takes advantage of the fact that the logistic curve is essentially linear in the range of .30 to .70. Because of this linearity, statements based on a probability of .50 also apply approximately to other probabilities in the .30 to .70 range. Further, any statement of effects is an approximation, since changes in any of the other independent variables will also affect the probability. However, because of the local linearity about the .50 level, such statements are least likely to be misleading for this value. Moreover, although the effects at the .50 probability are the largest possible, the relative influence of the independent variables remains the same regardless of the probability level chosen.

7. Given the starting point of .50, the highest level of court confidence could not truly have effects this large. But it should be remembered that the logistic curve is nonlinear, and that the effects of the independent variables are smaller in the tails of the curve. Therefore, in this case, a linear extrapolation would be misleading.

Earlier it was argued that perceptions and fear of crime may have little direct influence on the decision to own a gun for protection. People may perceive a substantial amount of crime around them and be fearful of it, yet still have confidence in the police and courts to provide a reasonable level of protection. The relatively small and statistically insignificant effects of the crime measures support this idea. Within the context of the current model, neither the perceived crime rate nor fear of crime influences the likelihood of gun ownership.[8] Thus, controlling for direct measures of collective security, perceptions and fear of crime do not have a clear influence on gun ownership for protection.[9]

DISCUSSION AND CONCLUSIONS

At least two major conclusions should be drawn from the analysis. First, the estimates derived from individual-level data are consistent with McDowall and Loftin's city-level time series. Perceptions of the effectiveness of collectively provided justice and security have a direct impact on the tendency of white male Detroiters to own guns for protection. It is reasonable, therefore, to conclude that the preponderance of evidence suggests that the perceived threat of victimization increases the probability of owning a gun for protection.

The second conclusion is that a citizen's confidence in the ability of police and the courts to control crime and punish offenders is conceptually and empirically independent of such things as fear of crime and the belief that the police should be unbridled in their pursuit of criminals. Some of the confusion in the existing literature seems to flow from the fact that relatively emotional reactions, such as fear, and ideological considerations, such as beliefs about civil liberties, have been confounded with the more instrumental dimension that has been identified as confidence in collectively provided security. The dimensions of behavior that Wright et al. (1983) identify as "fear and loathing" are clearly different from relatively instrumental concerns about the ability of the community to protect life and property. The findings reported here are quite compatible with the argument that generalized fear is

8. Although one might suspect that multicollinearity between the crime indices and the other independent variables could be responsible for the relatively small effects, such does not appear to be the case. The R-square between the fear index and the other independent variables is .23, and for the crime rate the R-square is .11, neither of which appears large enough to provide grounds for serious concern about multicollinearity.

9. It is also possible, of course, that these measures of fear and perceptions of crime are simply poor indicators of the underlying concepts. For example, the perceived crime measure asked respondents to compare the crime rate in their neighborhood with that in areas similar to it. A respondent may therefore perceive his neighborhood as less crime-ridden than others, but still consider the crime rate unacceptably high.

not strongly related to the decision to own a gun, but that perceptions of collective security are.

Finally, it is interesting to consider some of the wider implications of the model. One of the paradoxes of public opinion on gun control is that surveys show that large majorities of respondents favor gun control, but when preferences are revealed in referenda on specific restrictive policies, such as the 1976 Massachusetts referendum which would have banned the ownership of handguns (Holmberg and Clancy, 1977) or the somewhat weaker 1983 California proposition (Epstein, 1983), they fail with surprising regularity. A similar opinion-behavior puzzle is Schuman and Presser's (1981a, 1981b) finding that among their survey respondents who were equally concerned about gun permit laws, those who opposed them were more likely to have acted on the issue (written letters, contributed money, or both) than those who favored them.

These perplexities are routinely addressed by references to the overwhelming ability of the gun lobby to mobilize a minority of the population and pour money into advertising campaigns (Holmberg and Clancy, 1977; Schuman and Presser, 1981, 1981b; Epstein, 1983). While there may be some truth in the argument, it begs the question of why opponents of gun control—the gun lobby—are better able to mobilize resources than are supporters.

The collective security model provides a reasonable explanation for both patterns. Each follows from the fact that the expected benefits of gun control are collective in nature, while the expected benefits of gun ownership are individual. The fundamental deduction from the model of rational behavior in the prisoner's dilemma is that even when there is unanimous agreement about the benefits of a common good, self-interested individuals will not act to advance those interests except under special circumstances (Olson, 1971: 2).

The gun control issue is in fact structured as the multi-person prisoner's dilemma (Schelling, 1982: 114) where the benefits of one's own efforts depend on the number of other people who cooperate. If one gives up the right to arm oneself and others go along (voluntarily or due to coercion), then the benefits are clear. At the same time, however, there appears to be widespread belief that "if owning guns is made a crime, only criminals will own guns." If so, support for gun control should be highest among those with the most confidence in the police and courts to enforce prospective gun ordinances and keep criminals under control. Most Americans favor an unarmed society, but are reluctant to vote to disarm themselves without the assurance that others would comply with such a ban. A journalistic comment on California's Proposition Fifteen captures the dilemma (Epstein, 1983: 55):

> This crosspressure group (the undecided), as the pollsters call it, has no emotional attachment to guns—no gut feeling that they contribute to Americanism, manhood or security. The people in this middle group don't want to own a gun and, according to [one observer], "If they could

vote between a society in which everyone had a gun or no one had a gun, they would vote for a society in which no one had a gun." On the other hand, absent a conviction that a particular form of gun control will work, they are unlikely to vote to give up their right to own one.

Similar considerations may help explain why the gun lobby is more successful in mobilizing money and other resources than the control lobby. Focusing only on the crime control benefits of gun control versus gun ownership, it is clear that the two strategies involve qualitatively different collective choices. Gun control is a collective benefit that is realized only if large numbers of people give up their guns. In contrast, gun ownership is a private benefit that does not depend on the cooperation of others.

Thus, although the problems of mobilizing resources for either lobby is complicated by the "free rider" problem, the control lobby is at a distinct disadvantage. Rational self-interest dictates only that the individual costs of supporting the gun lobby do not exceed the perceived individual benefits, benefits that are assumed if the lobby succeeds. Benefits to gun lobbyists do not require that others buy guns, only that they be allowed to. The control lobby, however, is in a more difficult position. In order to achieve their crime control goals they must not only cover the costs of the campaign, but the ultimate success of the campaign depends upon the cooperation of significant numbers of gun owners and potential owners and upon the efficacy of those institutions charged with providing collective security.

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Appendix. Variable Descriptions*

Age—Age of the respondent in years.

Confidence in Courts—Linear combination of the following items:

A) How good a job do you think the courts are doing in keeping criminals off the streets?

1) Very good
2) Good
3) Not so good
4) Very bad

B) The courts have gone too far in making rulings which protect people who get in trouble with the law.

1) Strongly disagree, disagree, in between, agree
2) Strongly agree

C) Courts are much too lenient when sentencing criminals who have been convicted before.

1) Strongly disagree, disagree, in between, agree
2) Strongly agree

Confidence in Police—Linear combination of the following items:

A) If the police suspect that a serious crime has been committed, they should be allowed to search a home even if they don't have a search warrant.

1) Strongly disagree
2) Disagree
3) In between
4) Agree
5) Strongly agree

B) Police should be allowed to listen in on phone conversations if it is necessary to solve a serious crime.

1) Strongly disagree
2) Disagree
3) In between
4) Agree
5) Strongly agree

* In creating all indices, each item was assigned a weight inversely proportional to the number of responses.

Crime

A) (For residents of Detroit) In terms of crime, how do you think your neighborhood compares with others in Detroit? Would you say it is much more dangerous here, more dangerous here, about average, less dangerous, or much less dangerous?

0) Much less dangerous or less dangerous.
1) About average, more dangerous, much more dangerous.

B) (For residents of metropolitan area outside Detroit) In terms of crime, how do you think your neighborhood compares with others in the three-county area, not counting Detroit itself? Would you say it is much more dangerous here, more dangerous here, above average, less dangerous, or much less dangerous?

0) Much less dangerous or less dangerous.
1) About average, more dangerous, much more dangerous.

Education—Education of respondent in years.

Fear—Linear combination of the following items:

A) How safe would you feel walking alone at night, in this neighborhood?

1) Very safe
2) Reasonably safe
3) Somewhat unsafe
4) Very unsafe

B) How safe do you think it would be for a woman to walk alone?

1) Very safe
2) Reasonably safe
3) Somewhat unsafe
4) Very unsafe

C) Some people worry a great deal about having their house (apartment) broken into, and other people are not as concerned. Are you?

1) Very worried
2) Somewhat worried
3) Not worried

D) In general, have you limited or changed your activities in any way in the past several years because of crime?

1) Yes
2) No

Gun

A) Do you (or does anyone else here) own a gun of any kind?
   1) Yes
   2) No

B) (If yes) Is it for hunting, protection, or what?
   1) No gun for protection present
   2) Gun for protection present

Income—The natural logarithm of the respondent's total family income, for those family members living in the same house.

Police Power—Linear combination of the following items:

A) If the police suspect that a serious crime has been committed, they should be allowed to search a home even if they don't have a search warrant.
   1) Strongly disagree
   2) Disagree
   3) In between
   4) Agree
   5) Strongly agree

B) Police should be allowed to listen in on phone conversations if it is necessary to solve serious crimes.
   1) Strongly disagree
   2) Disagree
   3) In between
   4) Agree
   5) Strongly agree

CITIZEN GUN OWNERSHIP AND CRIMINAL DETERRENCE: THEORY, RESEARCH, AND POLICY*

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Research on the general and specific deterrents emanating from citizen-owned firearms is examined under assumptions about deterrence. Only slight and indirect empirical evidence for deterrence exists in the area of citizen gun ownership. The crime-reducing effects associated with public policies that support civilian gun ownership are balanced in light of other, negative public health factors associated with citizen-owned guns.

One of the more hotly debated topics within and without criminal justice circles is the extent to which citizens (that is, nonmilitary and nonpolice civilians) should have access to firearms. The issue has been approached from many perspectives, including the legal/constitutional one (Do citizens have a right to own guns?) (Halbrook, 1986, 1984; Kates, 1983, 1986); the safety perspective (Does gun ownership increase injury and fatality through accidents and suicides?) (McDowall and Loftin, 1985; Lester and Murrell, 1980); the prohibition of choice perspective (Should citizens be precluded from owning handguns or long guns?) (Kleck, 1986, 1984a); the criminogenesis approach (Does allowing citizens to own guns increase crime by providing a ready source of firearms for persons to use criminally?) (Newton and Zimring, 1969; Kleck, 1984b); and the anticriminogenesis approach (Does citizen gun ownership reduce crime through specific and general deterrence?) (Kleck and Bordua, 1983).[1] This latter question of criminal deterrence through citizens' guns is the focus of the present discussion.

Persons may own a variety of guns that fulfill a variety of functions. Tonso (1982: 21-40), in his work on the relativistic aspects of guns and gun ownership, has discussed three basic functions that firearms have in individual lives. First, guns can be used symbolically, as in an ornamental adornment over a fireplace or by a collector with an authentic desire to remember the Old West.

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1. Kates (1983: 270-272) has pointed out that citizen-owned guns may act as a general and specific deterrent to governmental encroachment (domestic and foreign), independent of their deterrent effect on criminal encroachment. He cites numerous international cases from recent times in which armed insurgent citizens have successfully fought their own government (and the United States) with guns (see also Marina, 1984; Kessler, 1984).

Second, firearms can be used recreationally, as they are by target shooters and hunters. Third, citizens' guns have a variety of practical functions. In terms of self-defense, firearms can aid in the thwarting of a criminal or animal attack. Regarding the present work, the ownership of firearms by citizens, independent of the function(s) for which they are owned, may be practical in a utilitarian sense as well, if ownership were to act as a basis for criminal deterrence.

The following discourse on criminal deterrence through citizen gun ownership comprises three parts: (1) an application of general theoretical assumptions about deterrence to the specific case of citizen gun ownership; (2) a critical review of the research literature on the topic; and (3) a discussion of other public policy implications of the research findings.

CITIZEN GUN OWNERSHIP AND DETERRENCE THEORY

SELF-DEFENSE VERSUS DETERRENCE

Consider the following anecdote: "two prowlers disappeared when a 67-year-old . . . widow shouted at them, but two hours later, they returned, smashing down her front door and storming into her living room. She picked up a pistol left by her late husband and, firing a gun for the first time in her life, wounded both men; they then fled."

In this story, taken from the monthly feature entitled "The Armed Citizen" in the National Rifle Association's *American Rifleman* (National Rifle Association, 1985: 6), the 67-year-old woman successfully defended herself from an actual criminal attack. She did not "deter" the crime. Because the crime (or at least its attempt) occurred, one could not say that it was deterred; more accurately, it was thwarted (see confusion in Wright, 1984: 323). In the present discussion, deterrence refers to the prevention of crimes from occurring altogether rather than to the altering of crimes already in progress.

There are two varieties of deterrence, specific and general. General deterrence refers to the punishment of criminals for the purpose of threatening (by example) persons in the general public with a similar sanction, thereby discouraging the commission of offenses by the general public. In the case of citizen gun ownership, the sanction to be considered by the potential offender is being shot (or held at bay) by an armed victim. Specific deterrence refers to punishing an individual in order to dissuade him/her from future criminal action. The sanction must be experienced personally to be a specific deterrent. In this case, actually being shot (or shot at) by an armed victim, or possibly even meeting one, could act as a specific deterrent.

The woman's use of the gun in the NRA ancecdote would act as a specific deterrent if it were to prevent some future crime by those two particular

would-be assailants, due to their fear of meeting another victim-wielded gun; however, that is unknown from the facts at hand. And, had the attackers who fled told others that they received gunshot wounds from their victim, those others may refrain from attacking the same victim or others in the future (because of a fear of experiencing a similar episode), in which case the others would be generally deterred; but, again, that is unknown from the facts at hand. Any discussion of deterrence based on the perspective of a self-defending citizen is erroneous; deterrence must be based on the perspective of the potential criminal. It is sometimes difficult, however, to separate the concepts of self-defense and deterrence because deterrence arises from perceptions about others' use of self-defense. (For a discussion of the success of citizens' use of firearms in self-defense, see Wright, 1984; Kleck and Bordua, 1983; Wright, Rossi and Daly, 1983: Chapter 7. For a discussion of the legal doctrines promoting the use of self-defense, see Kates and Engberg, 1982.)

SOCIAL CONTROL THROUGH CITIZEN GUN OWNERSHIP: DISTINGUISHING THREE ANTICRIMINOGENIC EFFECTS

According to Grasmick and Green (1980), three major kinds of inhibitors operate to promote social control of deviant behavior: fear of formal (governmental) sanctions, fear of informal sanctions, and what may be generally termed "morality" (inhibition of a behavior because it is contrary to one's values). First, regarding the fear of formal sanctions, citizen gun ownership may increase a potential criminal's perceived probability of formal punishment because being wounded or held at bay by an armed citizen would increase chances of apprehension by the police and, concomitantly, chances of conviction and legal punishment. Second, injury or death at the hands of an armed citizen could certainly be classified under "informal sanctions," although that category usually refers to "social" sanctions (for example, loss of significant others' respect) rather than "physical" ones such as a gunshot wound.

Third, regarding morality, there is a large group of individuals (call it Group A) who need not be deterred by any sanction threat, for they refrain from crime primarily because they are morally against such behavior (independent of any threat of receiving gunshot wounds from citizens or the police or being apprehended for the criminal justice system by citizens or the police). On the opposite end are those individuals (Group B) who cannot be deterred because they would, without regard for any possible gun-inflicted injury to themselves or a possible prison term, recklessly commit a crime. It is persons constituting a deterrable, Hobbesian-like third group (Group C)—those who will or will not commit a crime, depending upon their perceptions of the certainty of receiving gunshot wounds inflicted by citizens (or the police) or being held at bay for the criminal justice system by a citizen armed

with a gun (or the police—who are relevant to a discussion on criminal deterrence (see general descriptions of these groups in van den Haag, 1985: 190-191). The relative sizes of these three groups vary at any given time.[2] Although these groups' exact relative sizes can never be known, the extent to which the size of Group C exceeds the sizes of Groups A and B is the extent to which citizens' guns are important from a deterrent-based criminal control policy standpoint. Thus, if Group C is small relative to the sizes of Groups A and B, then the pool of potential offenders to be deterred by citizens' guns is also relatively small.

From the point of view of the persons in Group C, then, citizen ownership of firearms can offer the threats of both formal legal sanctions and the possible infliction of gunshot wounds, both of which (individually or collectively) could act as effective deterrents in addition to the deterrent factors presented by the possibilities of being shot and/or captured by the police without citizen intervention. It would be difficult to determine whether potential offenders in Group C are more likely to be deterred by the threats offered by armed citizens (gunshot wounds, capture) or the threats offered by the police (gunshot wounds, capture); however, from criminals' opinions, it appears that they are more afraid of being caught and being sent to prison than they are of being shot (either by the police or an armed citizen).[3] These two fears (of the police and of armed citizens) operate simultaneously (and maybe synergistically) to varying degrees in Group C; they should not operate at all in Groups A and B.

In a matter related to the anticriminogenic effects of morality, Gibbs (1975: Chapter 3) has emphasized the importance of "normative validation" in the study of the nondeterrent deviance-reducing effects of sanction threat (see also Andenaes, 1974, Chapter 2). This is a process by which an individual's moral condemnation of a deviant act is encouraged by a formal or informal sanction (or threatened one) for the commission of that act. Along the same

2. The relative sizes of these groups vary because it is possible for an individual to move from group to group. For example, a person in Group A or C may move to Group B in the heat of passion or for a political cause. And one could conceivably move from Group C to Group A or vice versa. Further, it is unknown which group the infants of today will eventually enter.

3. Wright and Rossi (1985) have conducted an extensive survey of convicts about their attitudes toward armed victims and the police; that survey will be discussed in more detail later. Their data reveal that offenders do not take more seriously the threat of being shot by a victim ("just over a third") than they do of being caught (54%) (50% thought "regularly" or "often" about going to prison before committing a crime) (Wright and Rossi, 1985: 28). Although the Wright and Rossi (1985: 27) data indicate that over half (57%) of those surveyed believed others were more afraid of armed victims than the police, respondents indicated they are *personally* more afraid of the latter than the former. However, the Wright and Rossi respondents' fears of being *shot* by the police are equal (34%) to their fears of being shot by a victim.

lines in the present case, it is conceivable that citizen gun ownership could be perceived by at least some potential criminals to represent a negative attitude toward predatory crime, which could act as a type of normative validator against predatory criminal behavior (those for whom this is true would be in Group A). The extent to which normative validation exists here is the extent to which crime reductions from citizen gun ownership are not due to Group C individuals' fears of being injured/killed or captured by an armed citizen. Isolating empirically the differential anticriminogenic effects of these three deviance inhibitors emanating from citizen gun ownership (fear of formal sanctions, fear of informal sanctions, normative validation) is problematic for researchers.

THE PROPER FRAMING OF THE DETERRENCE QUESTION

The proper framing of the question seems to be: to what extent is crime reduced because persons (in Group C) perceive citizens generally to have immediately accessible firearms that will be used to thwart an attack? The question is not whether citizen gun possession postpones crime under certain circumstances or in specific cases but, rather, whether citizen firearm accessibility *reduces* crime through deterrence. These are two very different questions, because preventing a crime in one area or at one time while concomitantly displacing it to another area or time does not reduce crime. In order to reduce crime overall, criminals (and potential criminals) would have to diminish the amount of their criminal activity.

The framing of the above question also emphasizes a potential offender's perceived certainty of randomly meeting a citizen in the course of criminal activity who is armed and willing to shoot in self-defense or to protect others. In Group C, persons' perceptions of the certainty of being shot or captured (rather than the true certainty of being shot or captured) is the relevant independent variable in the study of the general and specific deterrent effects of an armed citizenry (see discussion on perceived certainty in Gibbs, 1975: 7). Hence, analyses are of no value if they employ criminals' true probability of being shot/captured (rather than their perceived probabilities of these events) (for example, Kleck and Bordua, 1983: 281-284).

The other two perception variables in deterrence are of the celerity and severity of a sanction. Because one can assume that the potential criminal in Group C perceives both a quick (it is immediate) and a severe (it can cause death) informal sanction from being shot by an armed citizen (in addition to his/her perceptions of the celerity and severity of a formal sanction from the criminal justice system that would be encouraged by being wounded or held at bay by a citizen-wielded firearm), the only perception question remaining to be examined is whether that person believes the certainty of being shot by a citizen is sufficient to cause him/her to curtail or desist criminal activity.

The study of the gun ownership and criminal deterrence question is particularly problematic, because, as Wright (1984: 309) has noted, "crimes that are never . . . attempted because of advance knowledge that the potential victim is armed would never appear in any data source." Benson (1984: 339), too, has pointed out that "the deterrent effect cannot be accurately measured since we cannot count the number of crimes not committed for fear of confronting an armed victim." Isolating the net effects of the three anticriminogenic forces emanating from citizens' guns (threat of injury/death, threat of being captured, and normative validation) is difficult, particularly if one were to consider any criminogenic effects that their guns may produce and any independent anticriminogenic effects produced by the police (injury/death, capture) and the criminal justice system (imprisonment and normative validation).

Despite these inherent conceptual difficulties, several individuals have attempted to determine, through a variety of empirical approaches, whether citizens' guns deter crime. The discussion that follows critically reviews their work in terms of the deterrence question offered above, and their efforts are divided into three basic approaches: (1) research examining the effects of gun laws and gun ownership rates on crime rates; (2) research on perceptions of known criminals; and (3) the natural quasi-experiment.

CITIZEN GUN OWNERSHIP AND DETERRENCE RESEARCH

RESEARCH EXAMINING THE EFFECTS OF GUN LAWS AND GUN OWNERSHIP RATES ON GUN CRIME RATES

In what appears to be the most popular approach to the evaluation of civilian gun policies, researchers have applied techniques of varying sophistication (usually regression analysis) to examine how gun laws and gun ownership rates as independent variables affect gun crime rates. However, depending upon the direction of one's gun politics and the observed direction of the relationship, there are several conflicting gun policy interpretations one can infer from these types of analyses. For example, if gun crime rates are shown to be higher in states with lenient gun controls and/or high firearm ownership, one inference is that easier and widespread gun possession is criminogenic because more citizens' weapons are used in crime (for example, Newton and Zimring, 1969; Geisel, Roll, and Wettick, 1969; Seitz, 1972). However, an opposite causal ordering may be equally as plausible because, as Kleck (1984b) tries to demonstrate, such a relationship may indicate that citizens are arming themselves for self-defense in response to rising crime rates (that is, crime causes citizens to own guns rather than vice versa). And, if the opposite occurs (that is, lenient control/high ownership jurisdictions have

lower crime rates), the inference is that easy and widespread citizen gun possession is anticriminogenic because of its general and specific deterrent value (Blackman, 1985a). But here, again, there is a question about causal ordering, because as Polsby (1986: 97) notes, "it is reasonable to assume that many jurisdictions have adopted stringent gun control laws to combat existing high rates of violence [and] jurisdictions with low violence rates will have felt much less pressure to ban guns." His point is that gun laws may be a function of gun crime rates rather than vice versa. As Wright et al. (1983: 124) caution in their discussion of the alternative interpretations that one can derive from these kinds of analyses, "private weaponry [could] *respond* to some crimes [by citizens obtaining them for use in self-defense], *deter* others, and *cause* still others, all at the same time" (emphasis original). Thus, even if there are no differences found in crime rates according to gun laws and gun ownership (Lester and Murrell, 1981; Magaddino and Medoff, 1984; DeZee, 1983; Murray, 1975), anticontrol advocates could still argue that the rates would be higher with more controls while procontrollers could still argue that the rates would be lower with more controls. It is impossible to isolate accurately the net deterrent effects from these gun law/crime rate analyses.

These approaches have other inherent interpretational difficulties. For instance, the amount of gun availability may be unrelated to the incidence of gun crime (Magaddino, 1972), gun ownership in a given area may not be linked geographically to places where most crimes occur, and the type of weapon owned may not be linked to the kinds of weapons used in crime (Wright et al., 1983: 13). In additional, differences in gun violence may be a function of geographically specific cultural peculiarities rather than differences in gun laws or gun prevalence. A case in point is in the South, where higher gun crime rates may be caused by that area's greater subculture of violence rather than by its higher rate of gun possession (Gastil, 1971; Hackney, 1969; for a thorough critique of this work, see Loftin and Hill, 1974; Wright et al., Chapter 6). And, because the dependent variable usually employed in this kind of analysis is crime rates recorded by the police (which, except for criminal homicide, are subject to gross error and manipulation), the validity of the studies' results can be questioned even further. The adage that correlation does not imply causation seems especially apropos in this type of research. There is an even more fundamental problem with this kind of research as it relates to deterrence particularly—it does not raise the deterrence question from the viewpoint of the persons that are supposed to be affected (those in Group C). That is, before one uses these independent variables (gun laws and gun ownership) that assume a deterrent impact on potential criminals, one must first ascertain whether possible offenders (Group C) perceive citizens as being immediately armed under conditions of lenient gun laws and widespread gun ownership, and whether they perceive citizens in strict control/low ownership states as being immediately unarmed. As yet,

this has not been demonstrated.[4] Considering the numerous methodological and interpretational difficulties associated with this rate comparison approach, the works have no value for examining directly the question of net criminal deterrence based on civilians' guns.

RESEARCH ON PERCEPTIONS OF CONVICTED CRIMINALS

An approach that hits the deterrence nail more squarely on its head examines known criminals' opinions about armed citizens. Before turning to the most extensive of these convict surveys, it must be noted that deterrence inquiries that employ known criminals as respondents are based on what Zimring and Hawkins (1973: 30-32) have referred to as the "warden's survey fallacy." Such approaches are fallacious because this type of a sample is of no help in determining the number of persons in the general population (in this case, Group C) who are deterred from crime because of a threatened sanction (in this case, gunshot wounds and/or capture by an armed citizen). Further, one could argue that the fact that they are convicted criminals severely questions the validity of any of their responses that support the deterrent effectiveness of citizen gun ownership, because it is obvious in their cases that citizens' guns did not deter them from crime, at least entirely. And, as Polsby notes about the sample (1986: 97), "as a group, [they] are remarkable neither for honesty nor acute introspection."

The convict survey by Wright and Rossi (1985), cited previously, seems to be the most comprehensive of its kind, for it included some 1,800 incarcerated felons in 10 states. Selected portions of the Wright and Rossi piece have recently been cited, rather incorrectly it seems, by advocates of the deterrent value of citizens' guns (for example Kleck and Bordua, 1983: 283; Blackman, 1985b; Kleck, 1986: 46), although Wright and Rossi may not have intended the cited portions to be direct measures of deterrence.

For example, consider the following statements: (1) "A criminal is not going to mess around with a victim he knows is armed with a gun"; (2) "A smart criminal always tries to find out if his potential victim is armed"; and (3) "A store owner who is known to keep a gun on the premises is not going to get robbed very often." These are statements with which 56%, 81%, and 58% (respectively) of the respondents agreed (Wright and Rossi, 1985: 27). Blackman (1985b: 35) and Kleck (1986: 46) cite these findings as supporting general deterrence. However, the only inference one can take from these

4. This information may be obtainable from an analysis of state-specific convict survey data (regarding their beliefs about meeting armed citizens in the course of criminal activity), in which the states would represent gun laws varying from easy legal access for concealed weapon permits to more restrictive firearms controls. However, even the most extensive of these convict surveys (Wright and Rossi, 1985), which included prisons from ten states, only included one state (Georgia) that at the time of the survey allowed easy access to carrying-a-concealed-weapon permit.

results, it seems, is that potential criminals will avoid crimes against victims perceived to be armed and attack those perceived as unarmed, which would indicate crime displacement rather than crime deterrence. Moreover, as Wright and Rossi point out in a footnote (1985: 29), "Unless a victim were a policeman, a security guard, or carrying his weapon in a very obvious way, it would normally be rather difficult to make the determination [of whether the victim had immediate access to a firearm], most of all in committing a conventional crime (robbery, burglary, assault) against a conventional victim." Thus, even if a citizen *is* armed, there is no guarantee that the criminal will be aware of that fact prior to the commencement of an attack. One could even argue a counterproductive escalation effect associated with citizen-owned guns because, as Wright and Rossi found (1985: 23), among those who had used a firearm in criminal activity, one half saw the "chance victim would be armed" as a *very* important reason to carry a gun (although the respondents may have been referring here more to commercial victims than noncommercial ones), and a quarter (most of whom were predatory gun criminals) saw armed victims as an "exciting challenge" (Wright and Rossi, 1985: 27).

Blackman (1985b: 34) and Kleck (1986: 46) also seem to cite erroneously the following statement [to which 74% of surveyed convicts agreed (Wright and Rossi, 1985: 27)] as support for crime reduction through general deterrence: "One reason burglars avoid houses when people are at home is that they fear being shot." The implication of agreement to this statement is similar to that from an affirmative response to the above three items. It seems to imply only that the criminal will look for unoccupied premises or wait until the targeted premises are unoccupied, in which case burglary would not be reduced overall.[5] However, importantly, although the incidence of burglary would not be reduced overall, agreement with this statement by convicts would still imply that victim-offender confrontation in burglary would be reduced overall, which should reduce overall the injury and death inflicted on victims by burglary offenders (Kates, 1983: 268-269).

Blackman (1985b) and Kleck (1986) also cite the only Wright and Rossi (1985: 28) item that in any way directly addresses the crime reduction/general deterrence issue: "Was there ever a time in your life when you decided not to do a crime because you knew or believed that the victim was carrying a gun?" Three-fifths (61%) said that such an experience had not occurred, while one in ten said it occurred once, one in five (22%) said that it occurred "a few times," and 8% claimed that it happened "many times." Maximally, this could mean that for about 40% of criminals, the total amounts of their

5. In a related claim, Kleck and Bordua (1983: 282) cite one of Conklin's (1972: 85) professional robbers, who states he substituted robbery for burglary because of his perception that homeowners are often armed with a gun. This represents a displacement to a more serious crime type as opposed to displacement of time and/or place of victimization; there is no indication of deterrence, however.

criminal acts have been reduced to varying extents through citizen gun ownership. Minimally, however, it could mean only that in cases in which the offender chose not to do the crime because he thought a potential victim was armed, he found a replacement victim who was perceived as unarmed. If respondents' actions fall somewhere within this maximum and minimum, there would be at least some reduction in crime through deterrence. Inferences about absolute net crime reductions through general deterrence from responses to this question, however, are unwarranted without further qualification.

Convicts' responses might also be used to examine the specific deterrent effects of civilian gun ownership, but it would involve different assumptions than when measuring general deterrent effects. In specific deterrence, one must show that after having an actual experience with an armed victim, offenders reduced or resisted their criminal activity. However, again, although the Wright and Rossi convict survey items flirt with the (specific) deterrence question, they do not come to grips with it directly.

Over a third of all convicts surveyed (37%) admitted to having ever encountered a victim who was armed with a gun and about the same proportion (34%) stated that they had been scared off, shot at, wounded, or captured by an armed victim at some previous point in their careers. A fear of being shot by a victim was associated with those who had personally encountered an armed victim. Among those who had never encountered an armed victim, about half (48%) said they "never" thought about being shot by their victim; among those who had encountered an armed victim, 23% never thought about it. Further, among those who had at some time confronted an armed victim, 45% thought about being shot by their victim "regularly" or "often"; among the remainder, the comparable figure was 28% (Wright and Rossi, 1985: 28). It appears that personal experiences with armed victims make criminals evaluate more critically the potential gun-inflicted danger in future criminal attacks. However, there is no direct indication that any experiences with armed victims has caused them to curtail their criminal activity as a whole. Perhaps a more cogent general and specific deterrence-based question (unpiloted) that might be posed to known criminals is: "Have your thoughts about meeting armed victims ever caused you to reduce the overall amount of your criminal activity?"

RESEARCH USING THE NATURAL QUASI-EXPERIMENT

To assess accurately whether any sanction (threatened or actual) acts as a general or specific deterrent, the optimal design is an experiment. This method takes a measurement of the deviance rate (pretest), then introduces a sanction (specific deterrence) or threatens a sanction (general deterrence), and, finally, remeasures the deviance rate (posttest) to ascertain whether the intervention of the sanction or threat had any effect on the rate (a follow-up

rate measurement may also be utilized to assess the duration of the deterrent). A control group can be employed to insure that any changes found in the posttest measurement were attributable to the sanction or threat (rather than some other confounding variable). Although many approaches to the measurement of deterrence have been attempted, experimentation is the methodology that draws the fewest criticisms (for critical reviews of experimental and nonexperimental deterrence methodologies, see Zimring and Hawkins, 1973; Pontell, 1978; Green, 1985).

However, a deterrence experiment is only as valid as its measurements, and if an experimenter pretests and posttests representative samples of the universe of deviance, there are very few ways to criticize the validity of a deterrence experiment's results. The controlled field experiment (in which the researcher manipulates the introduction of the deterrent intervention) is more desirable than the naturally occurring quasi-experiment (in which the researcher is limited to measurements before and after some naturally occurring phenomenon) (Campbell and Stanley, 1963), but only the natural quasi-experiment is practical in the study of the general deterrent effect of citizen gun ownership (a natural quasi-experiment might also be used to investigate the specific crime-deterrent effects of civilian gun ownership).[6]

Kleck and Bordua (1983) have conducted a natural quasi-experiment that, with its attempt to utilize the equivalent of "control" groups, constitutes a viable design to study the general deterrent impact of citizen gun ownership in a single jurisdiction. These researchers took the forcible rape rate (which includes attempts) recorded in the *Uniform Crime Reports* for the periods before, during, and after a program that trained some 6,000 women in the safe use of firearms in Orlando, Florida (the program, which was highly publicized, took place between October, 1966, and March, 1967, and the major comparison rates were 1966 and 1967). As controls, Kleck and Bordua compared the before/after City of Orlando rates (where the program was undertaken) with rates in unincorporated Orlando areas and in Florida (excluding the entire Orlando area). If the recorded rape rate in Orlando city was noticeably lower than that for the remainder of Florida after the program went into effect, then Kleck and Bordua would conclude that the firearms

6. Such a natural quasi-experiment would conduct a pretest measure of the "velocity" (Green, 1978), or speed and force, of a criminal's career which existed *before* any encounters with an armed victim (such encounters would become known to the researcher *post facto* through surveys of known criminals). Subsequent velocity measurements (postest) would then be taken for the period *after* the encounter to ascertain whether the actual confrontation with an armed victim had any specific deterrent effect. Naturally, one would have to control for variables such as the "burnout" that is naturally associated with advances in age, any rehabilitative or specific deterrent effects that are a result of a prison term, and several other factors associated with individual desistance from crime. This particular quasi-experiment has several difficulties and may be impractical.

program had a general deterrent effect above and beyond any general deterrent effects already produced by the criminal justice system.

According to the authors, the rate differences were obvious—the City of Orlando experienced a dramatic drop (88%) in the recorded rape rate from 1966 (35.9/100,000) to 1967 (4.18/100,000), while the outlying Orlando area and the rest of Florida did not experience such dramatic recorded rape decreases for the same time period (11.05:10.02 and 14.2:15.01, respectively). The authors contend the following to buttress their conclusion of the excellent general deterrent effect of the women/firearms program: (1) the Orlando rape rate decrease was considerably larger than would be expected on the basis of variation in that rate during the recent past; (2) Orlando city, the surrounding area, and the rest of the State of Florida experienced increased or steady rates in virtually all nonrape crimes after the program was carried out; and (3) where there was a nonrape decrease, it was in the City of Orlando's burglary rate, which further emphasizes the deterrent benefits of the program because "burglaries would seem to be the next most likely crime target to be effected [sic] by a program that trained women in firearms use. . . ." (Kleck and Bordua, 1983: 287).

However, as mentioned above, an experiment's results are only as valid as its measurements, and there are considerable questions about the reliability of the dependent variable here (police-generated crime rates recorded in the *Uniform Crime Reports*). The crime rates presented by Kleck and Bordua may not necessarily reflect actual differences in the incidence of crime; rather, they may merely reflect differences caused by variations in citizen reporting of crime to the police and/or by police recording of crime for inclusion in the *UCR*.

Regarding the authors' first contention (that the reduction is too great to be considered random), the City of Orlando seems to have experienced a rather jagged yearly rate history for recorded forcible rape (including attempts) in the years prior to the firearms campaign. For example, one infers from any recorded rape/attempted rape rate of 0.0 (in 1963) for a city as large as Orlando that the recording procedures there are questionable. The recorded decrease in the City of Orlando from 1959-1960 was 58%, the decrease from 1961 to 1962 was 88%, and, of course, the decrease from 1962-1963 was 100%. Recorded fluctuations in rape in Orlando from 1964-1966 are similarly extreme. Hence, the authors' assertion (1983: 287)—that Orlando had not experienced a similarly large decrease prior to 1967 than in 1967—is misleading, given the changes in the rate recorded in, say, 1962-1964.

The second contention by Kleck and Bordua to buttress their conclusion of a strong general deterrent in the Orlando program involves their control groups. They assert that, because rates other than Orlando's rape (and burglary) rate were on the increase or stable directly after the program's implementation, the decrease in the City of Orlando's recorded rape rate

immediately after the program cannot be attributable to an overall decrease in crime; instead, it must be attributable to the program's general deterrent effect. However, a somewhat different interpretation emerges if one examines the recorded rape rates for aggregated periods before the program (1964-1966) and after it (1967-1969). The aggregated differences for the two time periods indicate that the rate decreased by 60.7% in the City of Orlando, yet the rate *increased* by 60.5% in the outlying (noncity) areas of Orlando. Assuming the statistics are valid, there seems to be a strong possibility that the women/firearms program has displaced at least some rapes to the outlying areas rather than having reduced rape absolutely. In favor of Kleck and Bordua, however, given that Floridians living entirely outside the Orlando area experienced a 41% increase in recorded rape over the two aggregated periods, one could say that at least some of the 60.5% increase in outlying Orlando is due to an overall rise in Florida rapes generally (excluding the City of Orlando). However, there is still room for some "spillover" or displacement of rape from the City to the suburbs of the City, in which case the strong deterrence conclusion of Kleck and Bordua needs more qualification.

Their third assertion—that the drop in the City's burglary rate is not unexpected, given the nature of the firearms awareness program—makes sense, but the burglary rate in the City of Orlando dropped only about 22% from 1966-1967, and, given fluctuations in crime rates recorded by the police in Orlando, the difference might seem relatively insignificant. In addition, the rate differences for the periods 1964-1966 and 1967-1969 show that the burglary rate *increased* by 20% in the City. From these figures, it is hard to draw any firm inferences on the effect (especially a lasting one) of the firearms/women program on Orlando's burglary rate.

In sum, the allegedly clear general deterrent effect of Orlando's program seems to be more suspect if one considers the City's recording practices and jagged rate variation, comparative rates for aggregated periods, and displacement. However, in support of deterrence, the recorded rape rate in Orlando did not reach its preprogram level until 1972, a half decade after the program was implemented, while the rest of Florida had steadily increased its recorded rape rate during that period to almost twofold. Ignoring the problems associated with the dependent variable, of all the works reviewed here thus far, the design and the findings of the Orlando quasi-experiment are the most convincing in terms of isolating a general deterrent effect of civilian gun ownership.

Other jurisdictions have also implemented, apparently successfully, media campaigns about their heavily armed citizens. For example, in Kennesaw, Georgia, persons were required to own guns through a city ordinance passed in 1982. Within a year, the recorded burglary rate dropped by 89% (cited by Kleck, 1986). Firearms training programs such as that in Orlando seem to have produced similar decreases in armed robbery of retail merchants (from

80 to zero in 2 successive 4-month periods in Highland Park, Michigan), drug store robbery (from 3 per week to 3 in 6 months in New Orleans, Louisiana), and grocery store robbery (90% in Detroit, Michigan) (cited by Silver and Kates, 1979: 167). As presented by Kleck and by Silver and Kates, however, these instances are essentially anecdotal in nature and, without data for analysis, no conclusions can be drawn about their validity.

COMMENTS ON CIVILIAN GUN POLICY IN RELATION TO DETERRENCE

The review of empirical work presented above has attempted to uncover any evidence of a reduction in crime caused by current levels of citizen gun ownership, in light of theoretical assumptions about deterrence. Only slight and indirect evidence of a crime-reducing deterrent effect (both general and specific) was found from convicts' opinion. In the quasi-experiment, general deterrence seems to have been directly demonstrated for a particular offense in one jurisdiction for a short while. Where evidence has been found to support absolute crime reduction through deterrence, it has been marred by concerns about displacement. However, displacement should be considered a positive finding for crime reduction if the displacement is to a less serious kind of offense. For instance, it was shown that convicted criminals claim to avoid premises they perceive to be occupied because they fear being shot by the dweller; this ought to displace at least some burglaries into situations less likely to result in injury and death to the victim (and offender).

As noted, the importance of civilian gun ownership to crime control policy is a function of the degree to which the size of Group C exceeds the sizes of Groups A and B. If Group C (those deterrable by citizens' firearms) is considerably smaller than Group A (those who do not commit predatory crime for moralistic reasons) and Group B (those who commit crimes without regard for citizens' guns), the policy question of whether gun ownership is a deterrent is a minimal one. However, if Group C is in any way large relative to the sizes of Groups A or B, then citizens' guns become much more important to a crime-control policy. Unfortunately, the previously discussed "warden's survey fallacy" described by Zimring and Hawkins precludes using known criminals as a measure of Group C, and one cannot expect valid responses from persons in the general public about whether they are in Group A, B, or C. One is left, then, with having to guess at the relative size of Group C.

If, for a moment, one were to infer any policy implications strictly from a utilitarian deterrence standpoint without knowing the relative size of Group C, notice must be taken of findings from known criminals indicating that at least some of them seem to view rationally the possibility that potential victim-citizens could be immediately armed (and, therefore, criminals would

seek victims perceived as being immediately unarmed). The crime control implication seems to be that the only way to minimize displacement of criminal victimization to those perceived as unarmed is to make criminals believe that more victims have immediate firearm accessibility. This would mean legal policies that would make constant and immediate gun possession more available to citizens (by relaxing laws against carrying concealed weapons) while at the same time severely penalizing criminal misuse of a gun. To increase normative validation and deterrence, publicity campaigns should emphasize the heavily armed citizenry, any cases of successful gun-inflicted self-defense, and any formal punishments given to gun criminals by the criminal justice system. Additionally, ancilliary legal policies would have to be developed, such as those that relax restrictions against civilian use of deadly force (Polsby, 1986) and those that consider state compensation for "crime intervenors" (for example, as in California), because the potential offender would also have to perceive that civilian victims and bystanders would be willing to shoot in self-defense and in defense of others, not merely that victims have immediate access to a gun. Utilitarian policy decisions cannot be based solely on deterrence, however.

To achieve the "greatest happiness for the greatest number," the lawmaker must balance all of the positive and negative ramifications of civilian gun policy relative to their strengths, as Wright et al. (1983) and Moore (1983) have attempted to do. Thus, while relaxing laws against citizen possession of firearms might, on the positive side, reduce crime through general and specific deterrence (and possibly even normative validation), negatively, citizens' firearms have been shown to have a counterproductive escalation effect on gun crime (Wright and Rossi, 1985: 23, 27), firearm accidents have been shown to increase with neophyte gun ownership (McDowall and Loftin, 1985), and a substantial number of criminals have been shown to steal the guns used in crime from citizens (Wright and Rossi, 1985). Ready access to guns may also aggravate injury and fatality in offenses where guns would not have been used had they been unavailable. Mass carrying of concealed weapons may even affect adversely the overall mental health of the public. However, given that criminals will obtain firearms if they so desire in any case (Wright and Rossi, 1985; Moore, 1983) and that the police have admitted that they are unable to protect citizens from criminal attack (Kates, 1984: 148-149), one could argue that citizens ought to have access to the means necessary to defend themselves during such an attack (Kates and Engberg, 1982), aside from any criminogenic or anticriminogenic effects from citizens' guns. Policy decisions about citizens' guns are particularly difficult when the policy maker is faced with evidence that is "six of one, half-dozen of the other." For instance, as Wright (1984: 323) finds, there is apparently an even tradeoff (1:1) between the incidences of firearm accidents and use of firearms in self-defense.

The policy debate about civilian gun ownership is likely to go on, perhaps

ad infinitum, especially given the numerous methodological difficulties in settling relevant questions and the overall tendency in this area to use science as a political tool. Independent of any positive or negative public policy implications, however, some have argued simply that Americans have the Constitutionally based individual right to keep and bear arms (Kates, 1983; Halbrok 1984, 1986).

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PROBABILISTIC MODELS OF YOUTHFUL CRIMINAL CAREERS

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This paper focuses on the characterization of the criminal careers of youthful offenders. It was found that these criminal careers could be modeled with parameters reflecting constant individual rates of offending and constant probability of career termination; population heterogeneity could be adequately represented by two distinct groups—designated here as "frequents" and "occasionals." These parameters were estimated for the multiple offenders in a London cohort studied from their first convictions until age 25. In that cohort, the frequents were estimated to have an annual conviction rate of 1.14 convictions per year (constant with age) and a probability of career termination of .10 following each conviction; the occasionals had an annual conviction rate of .41 and termination probability of .33 following each conviction; the frequents were estimated to comprise 43% of the population, and the occasionals the others 57%. While this parsimonious model structure was adequate for the London cohort, it must still be tested with other offender populations.

THE CRIMINAL CAREER APPROACH

In recent years, there has been increased interest in specifying the nature of criminal careers in terms of changes in offending over time, duration, and diversity across the population of offenders. This is partly because of the discovery that a small proportion of the population accounts for a large proportion of all offenses (Wolfgang, Figlio, and Sellin, 1972). It has been argued that, if prosecution resources and institutional and other treatment facilities could be used more selectively for these high-rate offenders, this might prevent a significant number of crimes. However, the importance of criminal career information goes far beyond the identification of "career criminals." Detailed information about criminal careers is fundamental to isolating the different facets of the career—initiation, the pattern of offending

during the active period, and termination. It is necessary to separate these different facets in order to test various approaches to the prevention or reduction of crime and to investigate different ways in which possible "causes of crime" affect these different aspects of criminal careers.

A "criminal career" refers to the temporal sequence of crimes committed by an offender.[1] It has an onset, a duration, and a termination. Between onset and termination, offenders commit crimes at some positive rate, and the rate may or may not vary over time. The aim in this paper is to develop and test various mathematical models to explain observed sequences of crimes in criminal careers.

In any such empirical endeavor, it is important to distinguish between an offender's true underlying crime rate and the observed rate based on the crimes he actually commits. Because of unpredictable and chance factors such as varying criminal opportunities, an offender with a true constant rate of 10 crimes per year may commit 5 crimes in some years and 15 crimes in others. Similarly, of two offenders, each with a true rate of 10 crimes per year, in any particular year one may actually commit 5 crimes and the other 15.

Also complicating matters is the difficulty of measuring directly even the actual number of crimes committed. Instead, some other indicator of the rate of criminal activity may have to be used, such as an arrest or conviction rate. Hence, the actual *crime* rate is related to the observed arrest or conviction rate by means of two probabilistic processes: the first relates the true to the observed crime rate and the second reflects the chance that a crime which is committed leads to an arrest or a conviction.

Because of the uncertainties in these processes, making inferences about the true crime rate from some measured crime rate requires assumptions that are expressed in a mathematical model of criminal careers. The adequacy of the model can be assessed according to its consonance with observations of individual crime patterns. The most useful models are often the simplest ones. This is not to deny that criminal careers are influenced by many complex factors. However, in the interests of parsimony, a simple model which predicts observed sequences of criminal events is usually preferable to a more complex one.

In the analyses reported here, the simplest models are tested first and more complex ones are developed when the simple ones fail to accord with the observed data. The approach to explanation is very different from that of delinquency theorists such as Hirschi (1969) and Elliott, Huizinga, and Ageton (1985). Such theorists invoke highly complex models of the causes of

1. There is no suggestion that the offender is necessarily engaged full-time in criminal activity, or that he derives the majority of his income from it.