DETERRENCE: SOME THEORETICAL CONSIDERATIONS*

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During the first half of this century, most research on deterrence suggested that punishment had little effect on behavior. These findings tended to confirm the ideological position of most sociologists, who generally assumed that criminal behavior was not and probably could not be controlled by legal sanctions. However, recent developments indicate that this assumption is in error. First, laboratory research (e.g., Banduara, 1969:292-353; Bandua and Walters, 1963) has demonstrated that under certain conditions, punishment can effectively and efficiently control behavior, and that such control can be obtained through vicarious reinforcement. Second, and more important, research since 1960 by both economists and sociologists, generally more sophisticated than earlier work, suggests that legal sanctions often play a significant role in preventing criminal behavior. (See, for example, Chambliss, 1966; Gibbs, 1968; Tittle, 1969; Logan, 1972; Chiricos and Waldo, 1970; Tittle and Rowe, 1974; 1973; Jensen, 1969; Waldo and Chiricos, 1972; Phillips and Votey, 1972; Phillips, 1973). Thus the issue for future research is no longer whether legal sanctions ever deter criminal behavior, but the specification of the conditions under which they have such an effect. This paper seeks to develop some hypotheses to guide future research on these conditions.

Deterrence theorists usually begin with a model of man as profit maximizer, that is, as a calculator of profit from estimates of gain and cost resulting from the projected act. Theories of deterrence attempt to spell out those conditions under which the perceived risk of punishment (cost) counterbalances the estimated gains from an act sufficiently to prevent commission of that act.

Tests of deterrence theory usually take the form of correlations at the aggregate or ecological level. The total rate (crimes/population) for some crime category within some population unit

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(national over time, state or county, for example) is correlated with a punishment rate for that same unit (number of individuals jailed/number of crimes, for example). A large number of personal risk assessments and the resultant criminal behavior are thus totalled and the total is correlated with the overall punishment rate. Unfortunately, results obtained by such methods are subject to many interpretations of what actually happens at the individual level. We will discuss some of these interpretations and suggest some ways of assessing their predictive power both with individual and with aggregate data.

It is already well recognized that the same risk of punishment does not have the same effect on each individual in a population. Leaving aside the question of variation by social power and prestige (in the actual risk of punishment, for example) for different individuals, we would expect some variation of "risk-effect" within a population even if the actual risk were accurately and similarly calculated by each member. That is, the same actual risk (probability of capture, for instance) will produce a different behavioral result for different individuals. Just one reason for this variation is that estimates of gain and, therefore, profit will vary. For example, gain from a comparable criminal act will be incrementally lower for the rich than for the poor. (Theft of $100 yields a greater "gain" for a poor man than for a rich one.)

Another reason to expect variation in risk-effect is that estimation of actual risk will not necessarily be accurate for each individual in the population. Most deterrence theorists have recognized that the immediate determinant of criminal behavior (from the deterrence standpoint) is the perceived risk and severity of punishment rather than the actual risk and severity. Data, however, are very limited on (1) how actual risk relates to perceived risk and (2) how perceived risk relates to behavior. Except for a few cases (e.g., Jensen, 1969; Waldo and Chiricos, 1972; Tittle and Rowe, 1973) only the somewhat unreliable data on certainty and severity of punishment derived from official statistics have so far been available. Nevertheless, we believe that it is time to begin speaking of deterrence as a mechanism of information transmission rather than simply as a sanctioning system. Only analysis of all the sources of information about risk and severity of punishment and how they are related to social environment, crime rate, and the actual risk and severity of punishment will enable us to understand how punishment relates to crime in a real society. In the paragraphs that follow we at-

tempt to present a detailed statement of how the deterrence process works as an information mechanism. We then demonstrate the usefulness of the conception by proposing several hypotheses which specify the mechanism's operation.

We define a system of deterrence[1] as a communication mechanism which attempts to inform a potential offender that:

1) If he commits a criminal act, the probability that the act will be detected by the authorities is high;

2) Once detected there is high probability that he will be caught, convicted and punished; and

3) The severity of punishment is great enough to more than offset any gain that might be achieved through the criminal act.

In other words, a system of deterrence is a system of communication that attempts to convey the message that, for persons who have committed a criminal act, "justice" is certain and terrible. The success of any deterrence process will be determined by the degree to which this message is successfully transmitted to the population of potential offenders.

The elements of a deterrence system may be recognized by their contribution to the deterrent function; namely, the communication to a target population that a criminal act is not worth the cost. The "system" to which we refer is a collection of elements organized around this specific deterrence function. Such formal organizations as the police, the various news media, and the judiciary, contribute elements to the system but are not the system itself.

We may distinguish between two types of deterrence systems, formal and informal. Formal deterrence systems operate by communicating a message of the risk of application by legally recognized enforcement agents of predefined negative sanctions for violation of explicitly codified rules (laws). Informal deterrence systems operate largely through interpersonal communication and typically involve sanctions at the interpersonal level.[2] Though analytically separable, the two systems are closely interconnected and each may affect the operation of the other. The informal system may (and often does) increase the cost of violating legal norms beyond those specified by the formal system. However, there are some cases, for example, when an individual

1. By "system," we mean only a complex of interacting elements, not necessarily *consciously* organized around some function and not necessarily "closed."
2. We believe that, to a large extent, the effects of values concerning law-breaking which are acquired through socialization can be treated as a consequence of such interpersonal processes.

is immersed in a deviant subculture, where the formal and informal systems may work against each other, tending to balance each other out. In general, the importance (power) of the informal system and its degree of compatibility or incompatibility with the formal system should be taken into account when assessing the effects of the formal system.

A system of deterrence will fail to the degree there is any condition in the society which undermines the "successful" transmission of the deterrence message. In order to be maximally effective or successful, a system of deterrence must transmit its message to all potential offenders.[3] The communication network, whether of the formal or informal system, must present the image that the sanctioning system is effective. In an open society, there will usually be at least some correspondence between the message transmitted and the actual effectiveness of the sanctioning system. In a completely closed society (such as a small groups laboratory) where the authorities have complete control over the communication about the actual consequences of criminal behavior, the effectiveness of the sanctioning system (i.e., the actual chance of criminals being punished for a crime) would be irrelevant to the success of the deterrence system.

We can identify three hypotheses which represent the core of recent deterrence theory. These are:

Hypothesis #1: *The greater the speed with which punishment occurs (the brevity of the reaction time), the greater the effectiveness of the deterrence system.*

Hypothesis #2: *The greater the severity of punishment the greater the effectiveness of the deterrence system.*

Hypothesis #3: *The greater the actual certainty of punishment the greater the effectiveness of the deterrence system.*

We shall discuss these three core hypotheses using the informational (perceived risk) approach, while reserving the bulk of this discussion for the issue of certainty (hypothesis #3). From this discussion we will draw additional hypotheses dealing with specifications of the deterrence effect.

Hypothesis #1 has undergone almost no empirical testing. Part of the problem comes from the identification of the point at which "punishment" begins. Arrest itself may be considered

3. If there is such a thing as a "spontaneous crime of passion" (and it is not clear that such a phenomenon exists), then we should understand that systems of deterrence are not designed or intended to prevent such crimes for the simple reason that the condition of a person contemplating (consciously or semiconsciously) such a criminal act is not met.

punishment (at least for most people in most circumstances). However, the formal initiation of punishment, for example incarceration, may occur months or even years after the individual is charged. More basically, we may ask through what process does celerity of punishment (even if the point of "punishment" can be identified) affect individual decision making. It is a basic tenet of operant theory and there is considerable evidence that the operant act and the reinforcer must be closely paired in time if the actor is to make the association between the two (Lawrence and Festinger, 1962:5). In the United States there typically is a considerable time lag between the commission of a criminal act and the formal initiation of punishment, and it may be plausibly argued that the time lag is great enough to eliminate the deterrence effect (e.g., see Gibbs, 1972).[4]

Furthermore, the issue is not the actual time lag but the perception of the closeness of the linkage. There is as yet no evidence whatsoever on the nature of this perception or its connection to the actual time lag. We suspect, however, that the crime and the punishment are sufficiently paired in the informal and formal communication networks so that the conceptual link is at least frequently made.

The severity of punishment is assumed to be one of the basic parameters involved in assessing the cost of committing a criminal act. The early work in deterrence dealt almost exclusively with the issue of severity, particularly the deterrence effect of the death penalty. Some studies show that severity of sanction is negatively related to the frequency of criminal acts (Zimring, 1971:69-71; Gibbs, 1968). However, other studies show severity to be either unrelated or related only under specific conditions (Tittle and Logan, 1973). Thus, although we can be fairly certain that severity of punishment at least occasionally plays an important deterrence role, we cannot be at all certain that it consistently does. Theoretically, one would expect the effects of certainty and severity to supplement each other; however, the interaction of certainty and severity appears to be quite complex, at least in our society, in part because high severity is associated with low certainty and vice versa (Logan, 1972; Bailey and Smith, 1972).

4. We are assuming the degree of cost, for example the number of months incarcerated, remains constant over time. It is conceivable that in some cases, for example a fixed fine in an inflationary system, deferring punishment will decrease its cost. We note that from a purely rationalist viewpoint there seems to be no reason to expect the time between an act and its consequent cost to make any difference: cost is cost no matter how long it takes.

The lack of consistent support for the deterrent effect of severity of punishment may be due to the way punishment is implemented in American society. Evidence from the Connecticut crackdown on speeders indicates that if enforcers feel the severity of the legally prescribed punishment is excessive they will often avoid enforcing the law (Campbell and Ross, 1968. See also Andenaes, 1966). Thus, the use of "severe" sanctions to control "minor" crimes may possibly be counter-productive.

It would seem that if criminal acts were ordered by seriousness and this ordering was the basis for determining the severity of sanction, this would increase the effectiveness of the deterrence system. First, officials charged with enforcing formal proscriptions would feel that the level of sanction was appropriate, and they would be less likely to circumvent the legal intent. Second, the ordering of seriousness and severity would facilitate the ease and clarity with which the deterrence message is communicated, a serious problem in large social systems (see hypothesis #10 below). In fact, in a social system with clearly graded "seriousness" categories of crime, if the severity of threat increases geometrically or exponentially (as opposed to arithmetically) with increased seriousness of crime the deterrence message may be most effectively communicated.

Hypothesis #3, which deals with certainty, has consistently been supported by recent deterrence literature (e.g., Gibbs, 1968; Logan, 1972; Chambliss, 1966; Tittle and Rowe, 1974; Phillips and Votey, 1972). In fact, we find the strength and consistency of the evidence somewhat surprising in light of the very low levels of certainty that occur (e.g., see Logan, 1972). It may be that perceived certainty is considerably greater than actual certainty (e.g., Jenson, 1969). In the remainder of the paper we shall focus on the issue of certainty because it empirically shows the strongest effects.

Past statements of deterrence hypotheses derive aggregate predictions from simple assumptions about human psychological processes operating at the individual level. We believe that prediction of aggregate crime rates from aggregate punishment rates through even a simple model of individual psychological proccesses requires a much more complex discussion of individual-social environment interactions. The remainder of this paper elaborates on these interactions.

We start with the key dependent variable in our model, the decision to commit or not to commit some criminal act. Staying with the profit-maximizing image of man, we then classify the

determinants of this decision as (1) assessments of cost and (2) assessments of gain. To the extent that the individual perceives profit or deficit, we can predict the individual's decision.

Traditionally, economists treat cost as if it were a calculable certainty. Elements of risk and elements of error may make cost estimates less reliable, but risk itself is only a small component of cost, the major part of cost being calculable and expected. In deterrence theory, risk (a probability of punishment) is generally treated as the cost for a particular act. Other costs, such as time, material, and legitimate alternatives foregone are included in the actual decision-making process but are rarely included in deterrence hypotheses by sociologists. Some economists, however, have attempted such calculations.[5] Using risk in calculation of costs leads to special problems, however.

From an operant perspective, we predict future behavior from the consequences of past acts. Reward increases the frequency of the behavior, punishment decreases it. The extent of influence of each reward or punishment depends on the strength of the reinforcement as well as its celerity (the sooner and stronger the punishment, the less likely future acts).

Operant theory, however, is not as vital to a development of a deterrence theory as it at first might seem. First, from a rationalist viewpoint, the number of *first* offenders is not given as some random number of actors that happen to commit crimes (much as the Skinner rat "accidentally" pushes the bar for the first time). On the contrary, all acts are the result of decisions made by each member of the population based on their estimate of the rewards and costs connected with the considered act. Furthermore, unlike operant theory, deterrence theory deals largely with decision-making about never committed acts (i.e., acts which have never been rewarded or punished for that individual because they have never before occurred). Therefore, we are dealing with estimates of reward and cost not connected with direct personal experience and the classical economists' rational model of a man would seem to be more appropriate.

However, unlike classical economists' assumptions that men accurately perceive rewards and costs and then proceed to act, we may expect a range of accuracy in prediction of actual rewards and costs among the individuals in a population. We can predict that for individuals who have already committed a given

5. Some preliminary attempts have been made to estimate the rate of return for burglary (with its probabilities of incarceration) vs. legitimate employment for the types of individuals who commit burglary (Sesnowitz, 1972; Krohm, 1973; Sesnowitz, 1973; Gunning, 1973).

crime, the parameters of the range of perceptions are more likely to be affected by the actual certainty of punishment. For this subset of the population, the actual certainty of punishment will be more closely related to criminal activity than for the population of non-offenders because their source of information about risk is first hand and therefore more accurate.[6] *Therefore, if we assume that direct experiential evidence is more accurate than information from indirect sources* we can expect that actual certainty of punishment will be more closely related to (be better correlated with) crime rate among the "already criminal." (Evidence from the California prison survey—Social Psychiatry Associates, 1968—shows just this relationship for estimates of severity of punishment. Also see Zimring and Hawkins, 1973: 142-149).

There are many reasons for believing that experiential evidence is more accurate. We believe that alternative sources of information about the risk of punishment, such as the mass media, give less accurate data about actual risk by vastly overestimating it. This is the case for a number of reasons. The mass media, both in its entertainment sector and in its news coverage, presents the legal system as more effective than it really is. That is obvious in the entertainment media, where the criminal rarely escapes capture and punishment. It also seems to us to be true of the news coverage in part, because the news tends to focus on those types of crimes (e.g., murder) which are more likely to be solved, and to underreport those crimes such as burglaries and muggings, which are rarely solved. Furthermore, the mass media devote a great deal of space to police investigations, arrests, trials and sentencing and the disproportionate coverage and emphasis convey an impression that law enforcement is fairly effective. Indeed, the more publicity given a crime by the media, the more police resources are focused on that crime, and the more likely it is to be solved.

In contrast, we believe the knowledge derived from personal experience and interpersonal communication gives a much more accurate picture of the relative effectiveness of the legal process. Perhaps the most obvious reason for this belief is that the value of the denominator in the certainty ratio

6. This prediction, incidentally, is derivable from both operant and rational images of man. From the operant standpoint, letting "X" represent the number of first offenders and "C" the certainty rate, number of "C" times "X" first offenders will be punished and therefore negatively reinforced for that criminal act. Thus, the larger the certainty of punishment rate, the larger proportion of offenders will be punished and therefore, if deterrence theory is corrct, deterred.

$\frac{\text{(Number of crimes punished)}}{\text{(Number of crimes known)}}$ is considerably smaller in the information obtained from the mass media than that obtained from the police. Furthermore, the police information itself is a considerable underestimate of the actual number of crimes. (This is clearly demonstrated in data obtained from surveys of victimization (for example, President's Commission, 1967a:27-28). We believe that the low accuracy of secondary sources of information about the actual risk of punishment usually takes the form of over-estimation of that risk: the more indirect the source, the greater the overestimation and, therefore, the error. We therefore propose the following hypothesis.

Hypothesis #4: *The more members of the social system rely on the mass media for their information about criminal behavior, the greater the effectiveness of the deterrence system.*

Hypothesis #4 is actually a two-way causal proposition. The first offender commits a crime, receives a more accurate (and *lower*, we predict) estimate of the risk of punishment for that crime and proceeds to make a new assessment of his chances—an assessment more likely to lead to increased criminal activity. In this way, the crime rate will feed on itself to the extent that the actual certainty rate is low and is overestimated by indirect sources of information.

Deterrence theorists have concentrated largely on simple one-way models of the deterrence effect, discussing only one type of feedback model at any length. This model will be referred to here as the "overload" hypothesis. This hypothesis states that as the crime rate grows, the capability of the law enforcement apparatus diminishes with regard to the solution of a given crime (and, therefore, the punishment of that crime). This hypothesis posits the same negative relationship between crime rate and punishment rate, but the usually predicted causal direction is reversed. The overload hypothesis, if mentioned at all, is usually only mentioned briefly by most researchers (e.g., Logan, 1972) and only Tittle and Rowe (1974: 460) have offered any evidence on it (nonsupportive, they feel).

This is a model of feedback at the aggregate level. That is, an increase in crime rate causes a decrease in the enforcement ratio $\frac{\text{law enforcement resources}}{\text{crime}}$ which in turn, decreases the risk of punishment and subsequently increases the crime rate. We wish here, however, to pursue an individual feedback proces-

sual model for potential crime committers which will be seen to have ramifications for the aggregate crime rate not obvious in such statements of deterrence relationships at the aggregate level.

We have discussed only the mass media as an indirect source of information. A more direct source is by visual or word-of-mouth communication about the consequences of crime. This can result from oneself or a social acquaintance being the victim of crime, knowing someone who commits crimes, or observing criminal activity first-hand among strangers. This more direct information is likely, we predict, to yield a more accurate—and lower—estimate of the risk of punishment for criminal activity than that obtained from the mass media. Shifting for a moment to analysis at the level of ecological units, it is clear that as the frequency of crime rises in a neighborhood, the saliency of such direct second-hand data rises, for we expect this more direct experience to take precedence over the less direct media experience. When the individual has the choice, he will usually place more reliance on personal experience than on the mass media (Hinnelweit, Oppenheim and Vince, 1958). This means that persons will rely on the media only when they have little personal contact with criminal activity, which will be characteristic only of persons who neither live nor work in high crime areas. As the importance of this more direct form of experience in making risk assessments increases, risk assessments will decrease (assuming once again that the mass media overestimate the risks involved in criminal activity).[7] Thus, assumptions at the individual level allow us to make predictions at the neighborhood level of analysis, to wit, that in an area with a low certainty of punishment the crime rate will tend to feed on itself, be self-generating and, *ceteris paribus*, rise exponentially.

This same prediction can be reached from a different angle. At the individual level, we might differentiate offenders along different lines. We hypothesize that events will often result in

7. We must state that such "direct" forms of knowledge may not always be more accurate. Due to the usually long time lag between a crime and its punishment (when it is punished), it is possible that direct knowledge actually *underestimates* the actual certainty of punishment because observations of victimization of strangers are rarely connected with final apprehension of the criminal. The news media may be more likely to present such a connection. Even in this case, though direct experience does not give a more accurate estimate of the risk of punishment, it nevertheless gives a much lower estimate. It is impossible to evaluate this hypothesis without empirical data.

We would also note that miscarriages of justice are observable chiefly through experience at the personal and interpersonal level. Knowledge of miscarriages of justice makes it appear that punishment is less a result of criminal behavior than a matter of luck, race, or class, and the deterrence message is thereby weakened.

different messages (estimates of risk) for different people. Let us assume, for example, that an armed robber has just been convicted for his crime. A child might receive the message that crime does not pay, a businessman who cheats on his income tax might receive the message that violent or "lower-class" crime does not pay, a burgler might receive a message that armed robbery is too dangerous and an armed robber might receive the message that armed robbery under particular circumstances—a bank for instance—is too risky. In general, the degree of specificity of a message will be affected by the person's ability to make relevant distinctions and to put the message into a refined context. Thus, it should be the case that the more one knows about crime, the more a deterrence message will be specific to particular types of crime. This in turn, will result in a less efficient deterrence system since a high risk of punishment for one type of crime will be less likely to be generalized to other types. Therefore, at the level of ecological units the message would tend to be more specific in high crime rate areas than in low, offering further reason for expecting the crime rate to feed on itself, even holding law enforcement activity constant. We therefore propose the following hypothesis.

Hypothesis #5: *The more members of a social system have detailed knowledge about crime the more specific the deterrence message and the less efficient the deterrence system.*

Notice that the last two ideas—direct experience with crime and message specificity—seem to make predictions similar to those of differential association theories of crime such as Sutherland's (1970). As a member of a crime-prone group, an individual is likely both to observe the risks of crime first-hand and to know enough about it to avoid naive conclusions about risks from crimes of a type different from his contemplated act.

In general, then, a high crime rate creates a very poor environment for an effective deterrence system. This follows directly from hypotheses 4 and 5, which suggest that the more personal contact one has with crime and the more one knows about crime, the less the effectiveness of the deterrence system. Similarly, if we assume that the certainty of punishment is lower in high crime rate areas than in low crime rate areas, then this idea also follows from hypothesis #3. Among other things, this indicates that a deterrence system will be more expensive and less efficient in just those areas that have the greatest need for an effective system. To put it more explicitly;

Hypothesis #6: The higher the crime rate in an area, the smaller the ratio $\frac{\text{crime deterred}}{\text{law enforcement resources}}$ in that area.

The hypotheses developed above suggest strongly that we should expect increased crime rate to result in decreased effectiveness of the deterrence system. As the crime rate increases, the difficulty (and, practically, the failure) of the deterrence system to fulfill its function increases because:

1) most obviously, the ratio $\frac{\text{police resources}}{\text{crime}}$ tends to decrease,

2) the specificity (narrowness of effect) of the message tends to increase (hypothesis #5), and

3) the conduciveness of the salient channels of communication to a weak deterrence message tends to increase (hypothesis #4).

In short, from a deterrence perspective, crime may react to itself, being both self-generating and self-expanding. This suggests that an expanding crime rate will become increasingly difficult to control. This may be one of the reasons that the crime rate has increased in the United States for the past three decades in spite of an increase in the investment in police resources.[8]

Leaving aside the notion of differential risk perception, it is clear that the perceived consequences of criminal behavior will have different meaning for different individuals. It seems probable to us that persons who receive relatively few rewards from the society, whether economic or social, would tend to place a greater value on the potential rewards for criminal activity. Furthermore, the costs of criminal activity are likely to be greater for those who are well rewarded by the society. This is obvious in terms of alternatives forgone. But it is probably also characteristically the case that those who are well rewarded by the society face greater informal costs, in terms of social stigma, for detected criminal acts. In contrast, for those on the

8. Crime rates for total index crimes both against property and against the person have increased since approximately 1940. Analysis of the data show that this has not been a linear increase, but an exponential one (see President's Commission, 1967b:22). Since 1940, the rate of policemen per 1,000 persons has increased each decade (not exponentially) in the United States (see Federal Bureau of Investigation, 1941:95; 1951:16; 1960:105; 1970:163).

There have been large increases in law enforcement expenditures in the same time period. But such increases are likely due to variables (urbanization, city growth, etc.) other than the crime rate and may even represent a decrease in law enforcement capability. See Bordua and Havrek, 1970.

fringes of the society, there is the possibility that there may even be some status gains for certain types of criminal activity (e.g., Short and Strodbeck, 1965). In general, it would seem that the deterrence system would be more effective in the upper classes than the lower class. It may also be the case that minorities who are discriminated against, such as blacks, will have less psychological commitment to the values of the society and this might diminish the informal costs to members of that group for committing particular criminal acts. We therefore propose the following hypothesis.

Hypothesis #7: *The effectiveness of the deterrence system will increase as the individual's investment in and rewards from* the *social system increase.*

For a wide range of criminal acts, the probability of being discovered and punished for a particular act is very low. Even after many crimes, the odds that the perpetrator will be caught for the next crime is not more than the probability of being caught for the first crime, and may in fact be even less if he has become more skilled in his criminal behavior. However, if the probability is .01 that a particular burglary will be solved, the probability is .63 that the person will be caught at least once if he commits 100 burglaries. This idea of "cumulative probability"[9] is probably a critical one in differentiating between potential offenders. If a potential offender has a long range view and has at least an intuitive understanding of cumulative probability, he is probably less likely to settle into a pattern of criminal behavior than the person who focuses on only one act at a time. Furthermore, persons who tend to have a future orientation and think in terms of a career, family, etc., are probably more concerned with the long-range consequences of being caught. In general, the more affluent members of the society, because of their socialization experiences, their education and possibly intelligence, are probably more likely to understand the principle of cumulative probability and to have a future orientation. This suggests that the deterrence system will be more effective with the middle and upper classes than with the lower class. Stated more formally,

Hypothesis #8: *The more the members of the social system understand and are concerned with the long-range consequences*

9. Building on the idea of cumulative probability, we would note that the severity component of the message must threaten a cost that is not only greater than the reward from a particular act, but that is greater than the reward from all the acts that are likely to be performed before the criminal is apprehended.

of their behavior, the greater the effectiveness of the deterrence system.

This, like all our statements, assumes *ceteris paribus* conditions. If persons in the upper classes see themselves as more likely to "beat a rap" because of their status and power, this of course, would diminish the effectiveness of the deterrence system.

The effectiveness of the deterrence system may also be affected by other factors, such as the size and complexity of the social system. From the individual perspective, an important characteristic of the deterrence message is a clear definition of norms and their seriousness. Humans are quite limited in their ability to store and process information (Miller, 1956; Campbell, 1958) at least with respect to the volume of information that flows through a social system. As the size and complexity of a social system increases, the number of legal norms tends to increase, and, as the number of legal norms increases, the ability of individuals clearly to perceive those norms decreases; we believe, therefore, that the larger the social system, the more criminal acts may occur simply through the blurring of societal norms. Furthermore, not only will the ability clearly to perceive the laws diminish as system size and complexity increases, but so will the ability to order offenses in terms of seriousness and to associate the degree of the severity of threat with gradation in seriousness. Thus, in large social systems, the message transmitted by the deterrence system will tend to have blurred referents, and its effectiveness should decline accordingly. Also, as the size and complexity of the system increases, the anonymity of the individual increases. As anonymity of the individual increases, the effectiveness of the detection system will decline, and this in turn will affect the certainty and speed of punishment and, therefore, the effectiveness of the deterrence system will be reduced. In proposition form,

Hypothesis #9: *The larger and more complex the social system, the less effective the deterrence system will be.*

Notice that this effect of system size, particularly in relation to increase in anonymity, leads us to the same conclusions about social disorganization and crime as those reached by classical theorists such as Durkheim.

CONCLUSION

Approaching the deterrence system as an information transmission mechanism and taking a closer look at what happens at

the individual level enables us to formulate more detailed hypotheses. We can begin to hypothesize about the circumstances under which actual rates of punishment will reduce crime. We can reasonably expect a wide variety of variables to specify the deterrence relationship: social class, social system size and past and present crime rate were chosen for discussion here, but many others may be equally important.

Further research must proceed in a number of directions. First and most obviously, we must ascertain what people estimate to be the risks of punishment for each type of crime.[10] We expect this estimate to vary widely not just from individual to individual but among different population units (cities and neighborhoods, for example) as well. This kind of research will be useful in a number of respects. It will allow us to test the central hypothesis of deterrence theory (that actual risk of punishment has a negative effect on the rate of crime). As pointed out earlier, the "overload" hypothesis predicts the same negative correlation as the central deterrence hypothesis and it is difficult to differentiate them empirically. However, if we can demonstrate a positive relationship between actual and perceived risk of punishment, and a relationship between perceived risk and crime rate, we can have much more confidence in the deterrence hypothesis.

Second, treating the deterrence system as a communication system operating through a variety of channels, we must empirically determine the magnitude of influence of each of these channels (word of mouth, criminal experience or victimization, the mass media, etc.) for different types of individuals. Such data may provide explanations for differences in perceptions of risk and may suggest otherwise unexpected processes, such as the feedback effect suggested earlier.

Third, preliminary analysis at the individual level allows us to make use of a wide variety of relevant research in sociology, psychology, economics, and even advertising. As an example, the relevance of Sutherland's differential association theory has already been mentioned. A wide range of cost-benefit analyses both at the individual and aggregate level are available from economists. There has been extensive advertising research into the effects of a variety of media techniques for influencing behavior. This allows for comparison of different types of mass media in terms of their impact on decision-making. Lastly, and

10. There has been very little done in this area so far. Jensen (1969) however, has attempted such measurements for delinquency and Tittle and Rowe (1973) for cheating on tests.

most obviously, psychological research on the effects of punishment and risk of punishment on behavior is vital to an accurate explication of processes at the individual level.

To sum up, we have attempted to improve the formulation and empirical development of deterrence theory by suggesting somewhat different approaches to theory building in this area than have so far appeared in the literature. We have questioned the assumptions of the classical rationalist approach—discussing perception of risk rather than assuming a direct effect of actual risk on crime rate. We have discussed processual in addition to simple static relationships. Such foci enable us to predict and test more specific hypotheses at both the individual and the aggregate level.

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