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CONVENTIONAL AND SPECIAL CRIME AND DELINQUENCY RATES*

MAYNARD L. ERICKSON,** JACK P. GIBBS† AND GARY F. JENSEN‡

Sociological theories of crime and delinquency originally emerged in an attempt to explain the ecological and social distribution of officially recorded offenses. Why is the rate of crime or delinquency higher in some parts of the city than others? Why is the rate higher for males? Why is it higher for the urban populace, minorities and the poor? Of course, even the early researchers questioned whether such data measured real criminal behavior or the official response to such behavior or both. However, while the validity and reliability of official statistics has been widely challenged, there has been very little attention paid to the components of the conventional crime rate formulae and the adequacy of such rates for scientific tests of criminological theory.

CONVENTIONAL RATES

The form of the conventional offense rate, [hereinafter COR], is O/P , where O is the number of offenses including crimes or delinquencies that occurred within a given social or territorial unit during a stipulated period, and P is the *estimated* number of members of the population of that unit during that period. Some versions of the conventional rate are more defensible than others, but there has been little work on the relative advantages of different versions. The reliance on census data limits alternatives in the way of estimating P (especially the inclusion of non-residents when computing crime rates for territorial units), and criminologists have been justifiably preoccupied with the reliability of official incidence

figures (*i.e.*, the numerator of the rate).¹ Even census data can be used to realize better approximations of P than is realized by simply taking the total resident populations as the denominator of the rate. Thus, in computing rates for rape, the sex ratio of each population might be taken into account, and in the case of auto theft rates, the number of vehicles is relevant in reckoning opportunities and/or units at risk.²

The nature of all such refined or adjusted rates depends on the type of crime in question, and the best refinement is commonly debatable. Nonetheless, the conventional rate and *all* refined versions of it are generally uninformative, whatever the reliability of the incidence figures.

To illustrate, given a city of 50,000 inhabitants and a robbery rate of 40 per 100,000 population for 1977, the rate does not reveal the *proportion* of residents who committed the act during the year (conceivably, all twenty instances could have been committed by the same individual, who may or may not have been a resident). The conventional rate would not reveal that possibility even if the numerator were absolutely reliable and all robberies were committed by city residents. In brief, it is the *form* of the conventional rate and not the reliability of data that makes the rate uninformative. Of course, no rate can be completely informative and as demonstrated below, what is relevant depends on the theory in question. The assessment of theories about crime will require *special types of offense rates*.

THREE TYPES OF SPECIAL RATES

Official figures on the incidence of crimes are tabulated primarily by time and place of

* This study is part of a much larger study on "Measures of Delinquency and Community Tolerance" funded by the Center for the Study of Crime and Delinquency (NIMH). We wish to express our gratitude to the entire research staff over the years of the project and especially to Mark Stafford and James Galliher who bore the direct responsibility for the analyses reported here.

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¹ See, e.g., Cressey, *The State of Criminal Statistics*, 3 NAT'L PROBATION & PAROLE A.J. 230 (1957); Wolfgang, *Uniform Crime Reports: A Critical Appraisal*, 111 U. PA. L. REV. 708 (1963).

² See, e.g., J. CONKLIN, ROBBERY AND THE CRIMINAL JUSTICE SYSTEM, at 10-18 (1972); Boggs, *Urban Crime Patterns*, 30 AM. SOC. REV. 899 (1965); Cressey, *supra* note 1; Wellford, *Age Compositions and the Increase in Recorded Crime*, 11 CRIMINOLOGY 61 (1973).

occurrence. Those figures cannot be used to compute any of the subsequent special rates, all of which require information on perpetrators, including previous offenses and history of apprehensions.³ Victimization data does not provide that information, nor do offenses known to the police, nor do official arrest records; hence, data on self-reported crimes and self-reported apprehensions are the only alternative. The reliability of such data is subject to question,⁴ and surveys of self-reported crime and delinquency are difficult (especially securing cooperation of prospective respondents), costly, and time-consuming. However, current judgments as to the reliability of self-reported data are indecisive, largely because of the scarcity of research on relations among offense rates based on different kinds of incidence figures (official, victimization, and self-reports) for the same populations.

The categorical rate. Although no well-known theory of crime is purely "normative," the attribution of social order to normative consensus suggests such a theory that centers on this proposition: The incidence of an act in a population is an inverse function of the moral condemnation of that act in the population. However, the proposition does not presume normative consensus; rather, it presumes that for any type of act there are two divisions of each population: (1) those who condemn the act and therefore refrain from it, and (2) those who do not condemn the act and therefore commit it. However, the relative size of those two divisions is not revealed by the conventional offense rate, because one member of the population (or a very small minority) could account for all of the offenses.⁵

To test a theory that treats criminality as a qualitative distinction, in that there are those who do not commit the act at all and those who

do, a special type of rate is needed. The formula is: $CL = N_1/(N_1 + N_0)$, where CL denotes the categorical offense rate, N_1 is the number of members of the population (e.g., residents of a city) who have committed the type of offense in question at least once, and N_0 is the number who have never committed the offense.⁶

There are numerous possible versions of the categorical rate. Thus, the count of offenses may be restricted to a definite period, or the period may be relative, such as offenses ever committed. In either case offenses committed outside a particular territorial context may or may not be ignored.

The repetitive rate. Whereas the categorical offense rate is strategic in contemplating tests of normative theories, still another special type of rate is needed to assess various social control theories, the deterrence doctrine in particular. Parties to the debate over the deterrence doctrine tend to think of punishment as either deterring or not deterring, but in responding to a perceived threat of punishment individuals may restrict their illegal behavior rather than refrain entirely. Offenses can be restricted in numerous ways, but the net effect of most such restrictions is to reduce the incidence of offenses. If the *primary* deterrent effect is re-

⁶ Obviously we are speaking in theoretical or ideal terms in explicating the special rates. There would, of course, be estimating procedures involved because no self-report survey even if limited to juveniles is likely to get more than a *good* representative sample of the population of a given territorial unit (e.g., residents of a city).

For many social control perspectives the "conformity rate" may be the best choice of a rate. It is defined very simply as [1.0-CL] and is simply the proportion (or percent) of the population that does *not* contribute to the crime or delinquency rate [NO] in the formula for CL. We anticipate many readers will feel that categorizing individuals as delinquent (non-zero) and non-delinquent (zero self-reported violations) is a return to the kind of thinking that hindered delinquency research for many years; namely, the view that delinquency is an attribute (like TB) rather than a variable (rate or frequency of behavioral events). This is not our intention. Quite the contrary we only argue that for many social control perspectives knowing the characteristics of those that *do not* contribute to the rate of deviance (however defined) is useful and justifies the use of the dichotomy. Furthermore, other rates, the repetitive rate in particular, are directly aimed at treating delinquency as a variable—without the confounding effects of permitting conformists to enter into the calculation of those rates.

³ J. GIBBS, CRIME, PUNISHMENT, AND DETERRENCE (1975). All three of the special rates considered here were originally formulated in Gibbs' work, but the author did not apply them or illustrate their use with actual research data.

⁴ See, e.g., R. HARDT & G. BODINE, DEVELOPMENT OF SELF-REPORT INSTRUMENTS IN DELINQUENCY RESEARCH: A CONFERENCE REPORT 15-25 (1965); Doleschal, *Hidden Crime*, 2 CRIME & DELINQUENCY LITERATURE 546 (1970); Reiss, *Surveys of Self-Reported Delicts* (1973) (unpublished paper).

⁵ But see J. SCOTT, INTERNALIZATION OF NORMS: A SOCIOLOGICAL THEORY OF MORAL COMMITMENT (1971).

strictive, then properties of punishment may have no relation to categorical rates. Nor could the restrictive effect be inferred from conventional offense rates, since a small proportion may commit the offense frequently.

To examine the restrictive effect of a threatened punishment, a special type of rate is needed. The formula is: $RE = \Sigma F/N_1$, where RE denotes the repetitive rate, N_1 is again the members of the population who have committed the offense in question at least once, and F is the number of times a N_1 individual has committed the offense. As in the case of the categorical rate, there can be several distinct versions of RE , with the distinctions having to do largely with the place and time of offenses.

The recidival rate. Virtually all recent deterrence investigations have been described as concerned with general deterrence because conventional crime rates were the dependent variable. However, those rates may reflect three distinct types of deterrence: (1) *absolute*, where individuals refrain entirely from crime as a response to the perceived threat of punishment; (2) *restrictive*, where an individual curtails his or her criminal acts with the intention of reducing the risk of punishment; and (3) *specific*, where an individual refrains from or curtails his or her criminality in response to a perceived threat of punishment that has been heightened as a consequence of the individual actually being punished previously.⁷ The appropriate rate for investigations of absolute deterrence is the categorical rate, while the repetitive rate is the most appropriate in investigations of restrictive deterrence.

When it comes to research on specific deterrence, a third type of special rate is needed. The formula is: $RL = F_p/N_p$, where RL denotes the recidival rate, N_p is the number of members of a population who have been punished on suspicion of a particular type of crime(s), and

F_p is the number of such crimes committed by an N_p individual *after* his or her punishment.

There are even more possible versions of RL than of CL or RE . In addition to the spacial-temporal considerations, N_p may not be limited to individuals who have been punished for the type of offense in question; rather, N_p could be all individuals who have been punished for any kind of offense, even though F_p is limited to subsequent offenses of a particular type. For that matter, punishment could be defined such that each step in the legal reaction process (*e.g.*, arrest, trial) is punitive, and hence each version of RL would be relative not only to a particular type of crime but also to a particular type of punishment.⁸

The "best" type of crime rate thus depends on the theory that is being tested. However, it could be that there is a close, direct relation between any two types of rates (including the conventional) *both* (1) among kinds of offenses in the same population or jurisdictional unit, and (2) among populations for the same kind of offense. Such a relation would obviously justify the use of convenience and data availability as criteria for a choice among types of rates for a given study, whatever the theory might be. In light of the foregoing possibility, there is a real need for purely descriptive investigation(s) of the relation between conventional rates and special rates. If close, direct relations do not hold, then further use of conventional rates would surely be questionable.

A RELATED LINE OF RESEARCH

Whereas surveys of self-reported offenses are typically limited to questions about frequency, much more detailed questions are necessary to gather the requisite data for special rates. Respondents would be asked not only about the time and place of each reported act but also about the time and place of legal reactions, if any, (*e.g.*, arrest, incarceration) to each act.⁹ Given such a range of necessary

⁷ J. GIBBS, *supra* note 3. One could presumably go a step further by making a distinction between two types of recidivists, both of whom have previously been exposed to punishment for a *particular* criminal act. One type of person refrains from further illegal acts of all types (generalized specific deterrence) because of his or her past punishment. The other merely restricts further violations of the particular act for which he or she was previously punished (restrictive specific deterrence). These distinctions and many others can be reflected through calculating special recidival rates.

⁸ See L. EMPEY & M. ERICKSON, *THE PROVO EXPERIMENT: EVALUATING COMMUNITY CONTROL OF DELINQUENCY* (1972). In this experiment, a wide range of recidivism rates are illustrated in actual research.

⁹ Again we speak here in terms of an ideal for the sake of making the strategy explicit. To gather data in this much detail would require the development of new methods of collecting self-reports while resolving recall and telescoping problems.

questions, the survey would have to be designed *solely* with a view of computing special rates, and such an enterprise would be dubious without preliminary evidence that special delict rates and conventional rates do diverge. One strategy is to consider *approximations* of special rates, with those approximations based on responses to questions posed in a survey that was not exclusively focused on gathering data for use in calculating special rates. Such a survey was conducted in six Arizona high schools. The survey questionnaire encompassed questions about various subjects including the perceived certainty of legal reactions and evaluations of the seriousness of offenses. Since the questionnaire included questions as to the commission of several kinds of offenses and related legal reactions, some of the data are relevant for present purposes. Prior to considering those questions, brief comments on the survey itself are in order.

RESEARCH DESIGN

Populations and procedures. Questionnaires were administered to a total of 3,268 high school students in six high schools. Three of the high schools were located in small towns of between 1,200 and 8,000 population in southern Arizona and three were located in the City of Tucson. Tucson is a metropolitan area of about 400,000 people and has ranked in the top ten among cities in terms of Federal Bureau of Investigation Uniform Crime Reports for the last two years.

The questionnaires were administered in classroom or cafeteria settings with steps taken to convince the students of the anonymity of responses (*e.g.*, requesting no names, allowing them to exchange questionnaires at the beginning of the session if they wished, and having them put their own questionnaire in the collection box).

The students receiving the questionnaire represented approximately eighty-seven percent of the small-town student body and sixty-four percent of the students attending the three Tucson schools. Overall, the sample encompassed nearly three-fourths of the available high school students. The only major limitation on the sample occurred at the three urban schools where data were collected from students in English and/or Social Studies classes.

Computation of the conventional rate. Two of

the questions asked took this form: "During the last twelve months how many times did you (*one of the offenses described in Table 1*)? How many times were you caught and taken to court?" Responses to the first question were used to compute a conventional delinquency rate and a categorical rate for each of eighteen kinds of offenses for each school population. The conventional rate was computed by the formula $[\sum F/(N_0 + N_1)]100,000$ where F is the "number of times response" by a student, N_0 is the number of students for which $F = 0$, and N_1 is the number for which $F > 0$.

Conventional rates of eighteen types of offenses for one of the Arizona high schools are shown in column 1 of Table 1 as illustrations. Readers who are accustomed to conventional crime rates based on *official* incidence figures may be struck by the high rates. However, those rates are based on self-reported offenses, and all findings in previous research indicate that the self-reported incidence of delinquencies or crimes is much greater than the official incidence.¹⁰ Yet, again, the concern is not with the reliability or validity of conventional crime rates; rather, it is with their *form*.

Conventional measures in research on self-reported offenses. Virtually all previous research on self-reported offenses has used the mean or median number of acts as measures of relative incidence. The mean number is of course a version of the conventional rate, the only difference being that the quotient in the formula is not multiplied by a constant value, usually 100,000. Accordingly, all previous and subsequent observations on the conventional rate apply to the mean number of offenses.

The other measure of incidence, median number of self-reported offenses, does differ from the conventional rate, and hence illustrative values are shown in column 2 of Table 1. Observe that the median for several acts is zero, and the significance of those zero values is emphasized in a subsequent section. For the moment, it suffices to point out that a zero value reflects the fact that the typical student reported *no commission* of the act in question.

¹⁰ See, *e.g.*, M. GOLD, *DELINQUENT BEHAVIOR IN AN AMERICAN CITY* (1970); T. HIRSCHI, *CAUSES OF DELINQUENCY* (1969); Erickson & Empey, *Court Records, Undetected Delinquency and Decision-Making*, 54 J. CRIM. L.C. & P.S. 456 (1963); Short & Nye, *Extent of Unrecorded Juvenile Delinquency: Tentative Conclusions*, 49 J. CRIM. L.C. & P.S. 296 (1958).

TABLE 1

STATISTICS PERTAINING TO RESPONSES OF STUDENTS IN AN ARIZONA HIGH SCHOOL TO QUESTIONS ABOUT 18 KINDS OF OFFENSES, 1975*

Delict Label and Descriptive Question	Conventional Rate Col. 1	Median Number Reported Col. 2	Categorical Rate Col. 3	Repetitive Rate Col. 4	Recidival Rate Col. 5	Mean Per- ceived Cer- tainty of Arrest Col. 6	Median Se- riousness Value Col. 7
Burglary: "Break into a place to do something illegal?"	136,000	0	.110	12.42	35.33	40.16	109.80
Shoplifting: "Take something from a store on purpose without paying for it?"	315,000	0	.321	9.82	10.38	33.61	99.59
Grand theft: "Steal something worth more than \$100 (not counting shoplifting)?"	15,000	0	.059	2.48	2.11	49.07	150.38
Petty theft: "Steal something worth less than \$100 (not counting shoplifting)?"	113,000	0	.167	6.77	1.00	38.39	100.00
Aggravated assault: "Beat up or hurt someone on purpose?"	134,000	0	.145	9.27	8.00	29.26	120.50
Simple assault: "Get into any fist fights or brawls (not counting the time you beat up or hurt someone on purpose)?"	247,000	0	.273	9.04	3.20	18.67	75.23
Vandalism: "Ruin, break or damage someone else's property on purpose?"	126,000	0	.215	5.86	.50	28.32	104.58
Using tobacco: "Smoke or chew tobacco?"	6,235,000	0	.412	151.50	183.00	8.16	25.48
Runaway: "Run away from home?"	22,000	0	.088	2.51	1.69	34.63	79.84
Truancy: "Skip school without an excuse?"	1,366,000	3	.623	21.91	20.64	9.07	29.56
Auto theft: "Take someone's car without their permission?"	42,000	0	.097	4.29	.50	43.76	149.96
Armed robbery: "Take money or something by threatening someone with a weapon (gun, knife, etc.)?"	12,000	0	.020	5.61	9.50	49.05	200.20
Unarmed robbery: "Take money or something from someone by just threatening them (without a weapon)?"	86,000	0	.059	14.65	0.00	31.35	140.30
Parental defiance: "Disobey or defy your parents?"	2,774,000	2	.616	45.02	114.40	11.98	50.03
Drinking: "Drink any beer, wine or liquor (not counting sips your parents let you have)?"	3,575,000	5	.707	50.55	109.00	22.76	49.78
Drunkenness: "Get drunk on beer, wine, or liquor?"	2,001,000	1	.567	35.27	84.28	29.24	60.38
Marijuana use: "Use any marijuana?"	3,263,000	0	.415	78.53	256.50	34.01	80.45
Other drugs: "Use any other illegal drugs?"	392,000	0	.164	23.96	364.00	39.32	149.57

* See text for a more elaborate identification of the variables. The name of the school is not shown at the request of school officials.

Of course, when the mode is zero the median could be computed such that it takes on some value between zero and 1.00 but such interpretation is debatable when the values are discrete.

Computation of categorical rates. The categorical offense rates in column 3 of Table 1 were computed in accordance with the previous formula and notational system, that is: $N_1/(N_0+N_1)$. Both variables, N_1 and N_0 , pertain to a period of twelve months, and that limit is particularly relevant in contemplating the fact that the categorical rate exceeds .50 for only four kinds of offenses.

Had the scope of the survey questions not been so limited, categorical rates could have been computed several different ways, such as by expanding the period to "time since entering the school" or excluding students who have attended other high schools. However, there is no one "correct" computational procedure, and the choice among alternatives necessarily depends on the availability of data.

Computation of repetitive rates. The repetitive rates in column 4 of Table 1 were computed by the Formula $\Sigma F/N_1$ where N_1 is the number of students who reported committing the offense at least once during the preceding twelve months, and ΣF is the total frequency reported by such a student. With a view to making repetitive and recidival rates logically distinct, the numerator (ΣF) should *exclude* offenses allegedly committed after a legal reaction to a previous delict; but that distinction could be recognized only in a survey designed exclusively for computing special rates.

Since one of the express purposes of the present article is to illustrate the rates, the inability to make this distinction is not fatal to the enterprise. In the present case, there is no defensible way to estimate the number of offenses committed by students prior to being "caught and taken to court." The alternative is to exclude all such students from the repetitive rate, but *exploratory work* along that line indicated that the correlation between such a "refined" repetitive rate and the present "unrefined" repetitive rates approaches unity. For that matter, in some lines of criminological research, there may be a need for a *comprehensive* repetitive rate, one that ignores distinctions as to acts before and after legal reactions.

Computations of the recidival rate. The recidival rates in column 5 of Table 1 were computed by the formula $(\Sigma Fc - Nc)/Nc$, where Nc is the

number of students who reported "being caught and taken to court" for the offense in question, and Fc is the number of such delicts reported by a Nc student during the preceding twelve months.¹¹ The temporal limits make the rates extremely relative but recall earlier we admitted to using present data only as approximates to illustrate the logical and possible empirical differences in rates. If a student was apprehended only a few weeks before the survey, he or she had little time to repeat the offense. It is virtually certain that some students were apprehended more than twelve months prior to the survey, but such a student would appear as a repeater and enter into a repetitive rate rather than the recidival rate. Finally, students were not asked to report offenses committed *before* and *after* apprehension, and it would be unjustifiable to assume that one-half of the self-reported delicts occurred after apprehension.

As the foregoing commentary indicates, the present recidival rates are subject to all manner of questions. However, a more defensible procedure would require a survey in which numerous questions would have to be asked about each type of offense, including such phrases as "during the past twelve months," "during the past two years," "have you ever." Questions that include those phrases would be asked to ascertain how temporal limits influence the rates, and still other questions would have to be asked about the place and timing of each self-reported offense and the residence of the respondent at the time. All of those questions should be asked regardless of the type of special rate under consideration, but additional questions would have to be asked about recidivism, such as the number of offenses before and after apprehension, the kind of punishment on apprehension and where each delict and apprehension occurred.

In short, attempts would have to be made to obtain the entire chronological pattern of offenses and reaction for a specified period of time. Moreover, whereas each of the present recidival rates is "offense specific," a "general" recidival rate could be computed for each kind of offense by counting the number of commissions reported by respondents as occurring

¹¹ Nc is subtracted from Fc on the assumption that at least one offense reported by each student took place before the student was caught and taken to court.

after apprehension for *any* kind of offense. Yet such a general rate would make the "before-and-after" distinction extremely relative and hence complicated. Finally, whereas "being caught and taken to court" is a very general legal reaction, separate recidival rates could be computed for each specific step in the legal reaction process (*e.g.*, a rate for individuals arrested with no further action, one for individuals incarcerated in a reformatory).

The point is not that a truly defensible measure of recidival rates can never be computed, but that it would be a costly, complicated enterprise. To justify such an undertaking, there should be evidence that at least one kind of recidival rate is not highly correlated with the conventional rate. The present recidival rates can be described as representing a particular kind and in that sense they may be meaningful. The rate for each kind of offense is specific, and each rate represents the *logical* maximum for the twelve months, as though all but one of the self-reported offenses took place after apprehension.

Other variables. Given a proposition in the form *Z* varies directly with *X*, it often happens that there are alternative indicators of the constituent variables. Assume that in this case there are two alternatives for *X*, designated as *X*₁ and *X*₂. If the correlation between *X*₁ and *X*₂ is positive and approaches unity, the choice between them in testing the proposition would be inconsequential. Otherwise, there is a problem. Simply using both alternatives in a test of the proposition is not an ideal solution, especially if the two test outcomes are divergent.

The problem is particularly relevant in contemplating the validity of the deterrence doctrine, for it could be that the threat of punishment has an impact only on the repetitive offense rate. That possibility cannot be examined as long as deterrence investigators continue to use only conventional crime rates. However, given evidence that the correlation between repetitive rates and conventional rates is positive and approaches unity, then the latter could be read as a proxy for the former. But suppose the correlation between conventional and repetitive rates is only .70. If so, some property of legal punishments (*e.g.*, their perceived certainty) could be inversely related with the repetitive rate to a moderate degree but unrelated to the conventional rate.

The foregoing is the basis for considering

variables other than offense rates in the present research. One such variable pertains to the perceived certainty of punishment, which is currently regarded as the central consideration in the deterrence doctrine.¹² The perceived certainty of punishment and related data were gathered in the present survey by posing this question: "Out of the last 100 times a juvenile (*offense described in Table 1*), how many would you guess resulted in an arrest?"¹³ Each response to that question can be expressed as a percentage (*i.e.*, the base is 100), and the average of those percentage figures for each kind of delict is shown in column 6 of Table 1.

An additional variable cannot be identified with a particular theory, but it is relevant in contemplating any and all "normative explanations" of variation in crime rates, one that attributes a low rate to intense moral condemnation of the type of crime in question. Such evaluations of offenses by students were elicited by posing this question: "In the following list (*offenses as described in Table 1*) the number 100 is used to indicate how serious stealing something worth less than \$100 is. What number would you give to each of the other acts in the list?" The medians of the numbers given by students for each offense are shown in column 7 of Table 1.¹⁴

¹² See, *e.g.*, J. GIBBS, *supra* note 3; F. ZIMRING & G. HAWKINS, *DETERRENCE: THE LEGAL THREAT IN CRIME CONTROL* (1973); Tittle & Logan, *Sanctions and Deviance: Evidence and Remaining Questions*, 7 *LAW & SOC'Y REV.* 371 (1973).

¹³ Of course, such a question could be phrased in various ways, one of which more nearly corresponds to "personal perception," that is, the individual's perception of his or her own chances of being apprehended. The present question elicits judgments of "aggregate certainty," but no claim is made that such perceptions are the most strategic in testing the deterrence doctrine. For that matter in comparing kinds of offenses in populations (as in the present case), the average values for the two kinds of perceived certainty (personal and aggregate) may be very closely correlated. In any case, there is no *a priori* basis for dismissing one kind of perception as irrelevant, which is to say that their relative importance can be assessed only through exploratory research and reference to type of research: macro-sociological or psychological.

¹⁴ Data obtained in this manner are commonly referred to as "magnitude estimates." The use of medians as values for such variables is conventional. See Hamblin, *Magnitude Measurement Methods*, in *MEASUREMENT IN THE SOCIAL SCIENCES: THEORIES AND STRATEGIES* 61 (H. Blalock, Jr. ed. 1974), for details of magnitude measurement techniques and conventions.

FINDINGS: RELATIONS AMONG TYPES OF OFFENSES

Table 1 is only *illustrative*; the complete set of data comprises six such tables, one for each high school. Given those tables and designating any two of the seven variables found in columns 1-7 as X and Y , there are two central questions. First, what is the X - Y relation among *kinds of offenses* in each school? Second, for each kind of offense, what is the X - Y relation *among schools*? The correlation coefficients in Table 2 answer the first question.

Median number of self-reported offenses. None of the correlation coefficients in the table per-

tains to the median number of self-reported offenses. This is because in all schools there are several kinds of offenses for which the median number of self-reported instances is zero, and hence the correlation (among kinds of acts) between median numbers and any other incidence figures is not substantial. The lowest correlations are: with conventional rate, $r = .685$ and $\rho = .546$; with repetitive rate, $r = .166$ and $\rho = .475$; with recidival rate, $r = .075$ and $\rho = .327$. The lowest correlations tend to be characteristic of two schools, but in no school does the correlation between median number of self-reported offenses and another type of incidence figure remotely approach

TABLE 2

CORRELATIONS AMONG KINDS OF OFFENSES, FIFTEEN PAIRS OF VARIABLES, WITH SEPARATE CORRELATIONS FOR EACH OF SIX ARIZONA HIGH SCHOOLS, 1975*

Panel Variables Correlated		Measure of Association	Bivariate Correlations Among Eighteen Kinds of Offenses					
			SMSA Schools			Small-town Schools		
			SI	SII	SIII	SIV	SV	SVI
I	Conventional rate and categorical rate	r	.694	.780	.875	.762	.696	.763
		ρ	.894	.902	.902	.914	.870	.921
II	Conventional rate and repetitive rate	r	.959	.957	.932	.958	.949	.948
		ρ	.928	.965	.819	.860	.874	.919
III	Conventional rate and recidival rate	r	.528	.841	.792	.697	.372	.557
		ρ	.793	.805	.545	.624	.268	.654
IV	Categorical rate and repetitive rate	r	.504	.613	.718	.611	.499	.593
		ρ	.734	.839	.641	.657	.668	.756
V	Categorical rate and recidival rate	r	.307	.580	.566	.456	.592	.841
		ρ	.588	.777	.584	.410	.306	.727
VI	Repetitive rate and recidival rate	r	.586	.875	.833	.764	.179	.337
		ρ	.784	.754	.593	.792	.225	.532
VII	Perceived certainty of arrest and conventional rate	r	-.636	-.641	-.617	-.624	-.638	-.599
		ρ	-.705	-.691	-.667	-.749	-.600	-.682
VIII	Perceived certainty of arrest and categorical rate	r	-.742	-.753	-.718	-.759	-.744	-.733
		ρ	-.762	-.771	-.730	-.822	-.802	-.792
IX	Perceived certainty of arrest and repetitive rate	r	-.566	-.570	-.515	-.538	-.540	-.491
		ρ	-.606	-.653	-.554	-.457	-.331	-.474
X	Perceived certainty of arrest and recidival rate	r	-.138	-.420	-.458	-.155	-.127	-.378
		ρ	-.274	-.573	-.447	-.216	.064	-.337
XI	Median seriousness and conventional rate	r	-.687	-.700	-.684	-.624	-.732	-.587
		ρ	-.777	-.797	-.766	-.753	-.789	-.754
XII	Median seriousness and categorical rate	r	-.823	-.824	-.782	-.792	-.817	-.759
		ρ	-.851	-.880	-.837	-.878	-.913	-.884
XIII	Median seriousness and repetitive rate	r	-.573	-.608	-.606	-.534	-.612	-.485
		ρ	-.633	-.728	-.686	-.484	-.556	-.509
XIV	Median seriousness and recidival rate	r	-.160	-.569	-.576	-.279	-.439	-.428
		ρ	-.440	-.699	-.561	-.216	-.308	-.508
XV	Median evaluation and perceived certainty of arrest	r	.862	.874	.885	.888	.869	.902
		ρ	.851	.829	.891	.862	.845	.934

* All rates are for crimes or delinquencies, and "median seriousness" refers to the seriousness values assigned by students to kinds of acts. The N for each correlation coefficient is 18. School names are not given at the request of officials.

unity. In light of these findings, the use of median values as a measure of the rate of self-reported offenses should be used with caution and only for studies where one of the other rates would not be better *theoretically*. The median numbers are scarcely more informative than the conventional rate; additionally, they are likely to be zero for each of several kinds of offenses unless investigators resort to an interpolation procedure.

Conventional rates and special rates. In panels I and III of Table 2 the correlation (r or ρ) between conventional rates and recidival rates does not remotely approach unity, nor does the correlation between conventional rates and the categorical rates. In at least one school the amount of variation in conventional rates that is explained by variation in either of the two special rates is less than fifty percent. However, the situation is complicated in panel I, depicting the relation between conventional rates and categorical rates, by the consistently higher values for ρ than for r . That difference suggests that the relation between the two types of rates is not linear, but inspection of scatter diagrams did not confirm that suggestion. Rather, the higher ρ values reflect the fact that in each school one or two kinds of offenses with extremely high conventional and categorical rates diverge considerably from the regression line. Hence, since ρ is less influenced by extreme cases, the r values are lower.

By contrast, in panel II the correlations between the conventional rate and the repetitive rate do approach unity. Note, for example, that for no school is r less than .900. *Those correlations take on substantive significance*, because they indicate that variation in the conventional offense rate is largely a function of the activities of repeaters, at least in the case of juvenile offenders. The findings also seem to imply clear policy implications.

Relations among special types of rates. The statistics in panels IV-VI clearly indicate that the incidence of a given offense is not a unitary phenomenon. Specifically, for some schools variation in one type of special rate (categorical, repetitive, or recidival) accounts for less than thirty percent of variation in either of the other two types. Putting the matter in more theoretical terms, whatever the cause, determinant, or reason for variation in one type of special rate, it is not the same for the other two types.

Needless to say, one set of findings is a thin reed for an argument, but in this situation the argument is akin to the falsification of a generalization. In principle at least, one case is sufficient for falsification, and several of the correlation coefficients in each panel (IV-VI) contradict the generalization of a near unity relation between any two special types of rates.

Perceived certainty of punishment and types of rates. Consistent with the deterrence doctrine, all of the correlation coefficients in panels VII-X indicate an inverse relation between the perceived certainty of arrest for an offense and *any type* of rate for that offense. However, some types of rates provide more support for the deterrence doctrine than do other types. *Without exception*, regardless of the school or the measure of association (r or ρ), *the magnitude of the coefficient of correlation between perceived certainty of arrest and offense rates is in the following order*: greater for the categorical rate, less for the conventional rate, still less for the repetitive rate, and least for the recidival rate. The difference between certain types of rates is not substantial, but it is remarkably consistent among all six schools.

While the present findings appear consistent with the deterrence doctrine, no version of the doctrine anticipates or explains the contrasts among types of rates as shown in panels VIII-X of Table 2. Specifically, why does the closest inverse relation hold between the perceived certainty of arrest and the categorical rate? Whatever the answer, the findings indicate that in testing deterrence propositions the choice among different types of rates is crucial.¹⁵

¹⁵ One possible answer is that values for both perceptions of certainty and the categorical rate pertain to the total student population, while the recidival rate is limited to students who reported being apprehended. That consideration could be important in further work on the deterrence doctrine (specifically, in examining the relation between the recidival rate and the perceived certainty of punishment, only perceptions of those who have been punished should be considered). However, the present research does not purport to be a definitive test of the deterrence doctrine, and for present purposes there is only one central question: To what extent is each special offense rate correlated with a particular independent variable? The independent variable must be the same, which would not be the case if the measure of perceived certainty were made relative to students who reported no commissions, those who reported one or more but no apprehension, and those who reported at least one apprehension.

Seriousness of offenses. Even though the relation between the perceived certainty of arrest and the offense rate is clearly contingent on the type of rate, it could be that all of the types of rates are more or less related the same way to the social-moral condemnation of offenses. The statistics in panels XI-XIV of Table 2 refute that possibility.

In no school does the correlation (r or ρ) between the median seriousness of act and the offense rate range less than from $-.699$ to $-.880$ depending on the type of rate. In the case of one school the range in r values is from $-.160$ (median seriousness and recidival rate) to $-.823$ (median seriousness and categorical rate). In all such comparisons the correlation between median seriousness and the recidival rate is the lowest, but even excluding that rate there is substantial variation in the correlation coefficients.

The findings in panels XI-XIV of Table 2 are thus additional evidence, along with those in panels VII-X, in support of a general principle—that the outcome of a test of a theory or proposition about offense rates is likely to be markedly determined by the choice of the type of rate. One may or may not be surprised by the findings that support the principle, but there is no logical or mathematical necessity for the divergent correlations.

FINDINGS: RELATIONS AMONG SCHOOLS

In the best of all possible worlds for criminological research, the choice between any two types of offense rates would be inconsequential with a view to testing propositions. Such would be the case if there were evidence that the correlation between any two rates is positive and approaches unity regardless of kinds of offense or populations. However, the statistics in Table 3 are indicative of the worst of all possible worlds, because the relation between any two types of rates among schools is anything but uniform from one kind of offense to the next.

Specific instances. Since the general conclusion has been stated, it is only necessary to consider a few specific instances.¹⁶ For any two of the

four types of rates, the coefficient correlation (r) between the two rates is negative for at least one kind of offense. Some of the substantial negative coefficients may be theoretically important, but the more immediate consideration is that one type of rate cannot be used as a proxy for another type. The correlation between the conventional rate and the categorical rate approaches unity ($+.90$ or greater) only for burglary and shoplifting (see column 1 of Table 3). A close relation between conventional rates and repetitive rates holds only for seven offenses: burglary, shoplifting, grand theft, simple assault, truancy, auto theft, and parental defiance. Finally, only in the case of grand theft does the correlation between conventional rates and recidival rates approach unity (see column 3).

What has been said of the correlation between conventional rates and special rates applies all the more to the correlations between any two types of special rates. In only one of fifty-four instances (see columns 4-6, Table 3), does the correlation approach unity—the correlation between the conventional rates and the recidival rates for burglary.

Perceived certainty of arrest. Given the rarity of near-unity correlations between different types of rates (columns 1-6, Table 3), it is not surprising that the correlation among schools between the perceived certainty of arrest and delict rates is contingent on the type of rate (columns 7-10, Table 3). That was also the case in comparing kinds of delicts in each school population (Table 2), but the correlation coefficients in Table 3 reveal another horrendous problem in attempting to assess evidence pertaining to the deterrence doctrine and other social control perspectives. The correlation between the perceived certainty of punishment and offense rates depends not only on the type of rate, but also on the kind of offense. In the case of conventional rates, the coefficient of correlation varies from $-.892$ (shoplifting) to $+.515$ (simple assault); the extremes for categorical rates are $-.934$ (aggravated assault) and $-.163$ (armed robbery); the extremes for repetitive rates are $-.902$ (armed robbery) and $+.684$ (aggravated assault), and the extremes for re-

¹⁶ One type of rate, median number of offenses, is excluded in Table 3 because it is zero for several kinds of offenses in each school population. Thus, just as there is very little variance in the median number among kinds of delicts in the same school

population, as in column 2, Table 1, for each of several kinds of delicts there is very little variance in the median number among schools.

TABLE 3
PRODUCT-MOMENT COEFFICIENTS OF CORRELATION AMONG SIX ARIZONA HIGH SCHOOLS, FIFTEEN PAIRS OF VARIABLES FOR EACH OF 18 KINDS OF OFFENSES*

Delict Label	Conventional Rate and			Categorical Rate &			Repetitive Rate &		Perceived Certainty of Arrest and						Median Seriousness and					
	Rate			Rate			Rate		Rate						Rate					
	Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14	Col. 15	Col. 16	Col. 17	Col. 18	Col. 19	Col. 20
Burglary	.485	.931	-.168	.144	-.204	-.031	-.405	-.747	-.206	.001	.563	-.759	-.770	-.511	.630					
Shoplifting	.957	.971	.160	.871	.234	.035	-.892	-.933	-.768	-.467	.739	-.537	-.683	-.398	-.754					
Grand Theft	.663	.991	.901	.560	.458	.910	-.816	-.690	-.768	-.875	.232	-.387	-.648	-.346	-.264					
Petty Theft	.827	.832	.219	.384	.188	.231	-.934	-.926	-.627	-.250	**	**	**	**	**					
Aggravated Assault	.332	.710	.339	-.404	-.062	.204	.010	-.934	.684	.194	.530	-.796	-.778	-.218	.004					
Simple Assault	-.100	.944	.527	-.418	-.038	.449	.515	-.511	.676	-.245	.201	-.475	-.681	-.205	-.155					
Vandalism	.552	.746	.849	-.138	.230	.806	-.106	-.731	.452	-.088	.215	-.362	-.161	-.379	-.296					
Using Tobacco	.132	.822	-.634	-.452	.520	-.856	-.458	-.367	-.207	-.160	.890	.493	.734	-.030	-.267					
Runaway	.718	-.177	.754	-.301	.809	-.270	.003	-.356	-.424	-.479	.514	.200	-.484	-.110	.067					
Truancy	.912	.932	.660	.716	.541	.593	-.556	-.275	-.768	-.043	.381	.912	-.980	-.761	.493					
Auto Theft	-.287	.978	.293	-.465	.605	.100	-.042	-.660	.140	-.837	.718	.008	-.304	.088	-.365					
Armed Robbery	.835	.479	.607	-.078	.680	-.023	.642	-.163	-.902	-.367	.578	.165	.661	-.765	.450					
Unarmed Robbery	.724	.726	.749	.104	.588	.319	-.645	-.874	-.225	-.390	.150	-.051	-.511	.560	-.313					
Parental Defiance	.720	.942	-.705	.445	-.775	-.542	-.246	-.497	-.068	.400	.547	-.354	-.873	-.028	.649					
Drinking	.785	.886	.289	.415	-.169	.502	-.270	-.590	.029	.737	.366	-.497	-.535	-.254	-.251					
Drunkenness	.855	.796	.425	.366	.458	.236	.729	-.788	-.402	-.848	.806	-.546	-.743	-.126	-.613					
Marijuana Use	.665	.206	.186	-.593	.817	-.855	-.719	-.678	.147	-.198	.483	-.438	-.565	.285	-.508					
Other Drugs	.400	.584	.264	-.504	.351	-.081	-.612	-.892	.185	-.062	.808	-.184	-.616	.316	.427					

* Each r is based on a N of 6 (i.e., among six high schools).

** The seriousness value is 100 for all schools, i.e., petty theft is the standard of comparison in each school.

cidival rates are $-.875$ (grand theft) and $+.737$ (drinking).

It should be observed that the extremes are never for the same offense. Indeed, of the eighteen kinds of offenses, repetitive armed robbery rates are the most consistent with the deterrence doctrine, but conventional armed robbery rates are the least consistent with the doctrine. The only simplification lies in this finding: with only three minor exceptions (petty theft, using tobacco, and marijuana use), the least support for the deterrence doctrine obtains when the conventional rate is the dependent variable. In some instances the differences are truly substantial. For example, whereas the correlation between the perceived certainty of arrest and the conventional rate for aggravated assault is $.010$, the corresponding correlation for the categorical rate is $-.934$. Given such findings, it is dubious to continue using the conventional rates to test deterrence propositions.

Although the present research was not designed primarily to test deterrence propositions, a further brief commentary is in order. Investigators may be surprised by the finding that the outcome of tests of deterrence propositions depends on the type of rate employed, but they will not be surprised by the difference among kinds of offenses. Even advocates of the deterrence doctrine grant the possibility that the threat of punishment deters individuals from some kinds of offenses more than others. However, when it comes to identifying those kinds that are "more deterrable," no conventional distinctions appear to be consistent with the present findings. In particular, Chambliss has argued that "low commitment and instrumental" acts are more deterrable than "high commitment and expressive" acts.¹⁷ Insofar as acts can be so classified, there does not appear to be any support for Chambliss' argument in the present findings. To illustrate, it is difficult to see how the degree of commitment or instrumentality differs sharply for burglary, shoplifting, armed robbery, and unarmed robbery. Yet, regardless of the type of rate considered, the findings are much more consistent with the deterrence doctrine for some of those acts than for others. The findings do not refute the idea of "differential deterra-

bility." Rather, if that idea is to be incorporated into a sophisticated theory of deterrence, then conventional analytical distinctions as to kinds of offenses appear irrelevant.

Seriousness of offenses. Most of what has been said of the perceived certainty of arrest also applies to student perceptions of the seriousness of acts and types of rates. Specifically, the relation between seriousness values and offense rates is also markedly contingent on both the type of rate and the kind of offense. However, the relativity as to type of rate is more surprising than in the case of the perceived certainty of arrest. Whereas the deterrence doctrine is so vague that it implies nothing about which type of rate is the most highly correlated with properties of punishment, that is not the case for a normative explanation of variation in rates.

Insofar as perceptions of seriousness reflect normative evaluations of acts, numerous individuals would be expected to refrain entirely from offenses that are judged as very serious. Stating the matter another way, whether or not individuals commit a particular kind of offense at all is primarily a function of the normative evaluation of the act, but the frequency of commission is a function not only of normative evaluation but also of opportunities for commission and restrictive deterrence. Accordingly, the prediction is that seriousness values should be more negatively associated with categorical rates than with other types of rates. The argument underlying that prediction may or may not appear plausible, but in any case the prediction is incorrect for six of the eighteen acts.

ANOTHER MODE OF ANALYSIS

Up to this point only bivariate relations (Tables 2 and 3) have been considered, with schools or kinds of offenses taken as the units of comparison. Table 4 reports a more comprehensive analysis, with all of the variables considered simultaneously, including schools and kinds of acts.

All four of the regression models suggest the same conclusion—that variation in the conventional rate is predominantly a function of variation in the repetitive rate, and, to a lesser extent, variation in the categorical rate. That conclusion is consistent with previous observations in the bivariate analysis about the conspicuous contribution of repeaters to the conven-

¹⁷ Chambliss, *Types of Deviance and the Effectiveness of Legal Sanctions*, 1967 Wis. L. Rev. 703.

TABLE 4

BETA COEFFICIENTS IN FOUR REGRESSION MODELS, WITH THE CONVENTIONAL OFFENSE RATE AS THE DEPENDENT VARIABLE AND VARIOUS COMBINATIONS OF INDEPENDENT VARIABLES: 18 KINDS OF OFFENSES IN SIX ARIZONA HIGH SCHOOLS*

Model	Variables Excluded	Independent Variables**					
		Perceived Certainty of Arrest	Median Se- riousness Values	Categori- cal Rate	Repeti- tive Rate	Recidival Rate	R ²
I	(1) schools and (2) kinds of acts	.03	.03	.37	.77	.00	.956
II	(1) perceived certainty of arrest, (2) median seriousness values, and (3) kinds of acts	—	—	.32	.75	.01	.978
III	Schools	.12	-.07	.43	.75	.02	.983
IV	None	.18	-.06	.41	.76	.03	.984

* Each beta coefficient is based on a *N* of 108 (i.e., a rate for each of 18 kinds of offenses in each of six school populations).

** Individual schools and kinds of delicts (dummy variables) are not listed because for no school is the beta coefficient greater than .02 and for no kind of acts is the beta coefficient greater than .11.

tional offense rate. However, the beta (β) coefficients in Table 4 for the categorical rate indicate that an adequate theory of offense rates must account for conformists, who never commit the deviant act(s) in question, as well as repeaters. Moreover, the substantial beta coefficients for the repetitive rate may mean only that *overall* it accounts for a substantial amount of variance in the conventional rate. As shown in Column 2 of Table 3, the relation between the repetitive rate and the conventional rate among schools is not close for some kinds of offenses.

The negligible beta coefficients for the perceived certainty of arrest, median seriousness of offenses, schools, and kinds of offenses becomes understandable once it is recognized that such variables can be related to the conventional offense rate only through one or more of the special offense rates. Obviously, the conventional rate is a mathematical function of the three special rates, but that point is likely to be misunderstood. The strictly mathematical relation does not insure a close and direct empirical relation between *each* of the three special rates and the conventional rate. This is crucial in contemplating the use of the conventional rate as a proxy for one of the special rates. The point takes on special significance in the case of the recidival rate. For virtually all kinds of offenses in all schools, the absolute number of recidivists is very small. That alone suggests that the recidivists do not make a major contribution to the total conventional

rate. Yet the small number of recidivists in itself does not preclude a close correlation between the recidival rate and the conventional rate. However, most of the correlations between the two rates are negligible; hence the findings indicate that the conventional rate cannot be used as a proxy for the recidival rate.¹⁸

SUMMARY AND CONCLUSIONS

Of the four types of offense rates (conventional, categorical, repetitive and recidival) considered, not one can be safely taken as substitute or proxy for another. This is because the correlation between any two types of rates is not positive and substantial both among offenses in the same population and for the same kind of offense among populations. Moreover, the results obtained in testing propositions about rates are clearly contingent on the type of rate.

Since the findings are limited to six Arizona high schools, no generalization is implied about offense rates in all populations, especially adult populations. However, it could be that the types of rates diverge even more for adult crimes. If criminal maturation extends beyond high school and specialization in particular crimes is a facet of maturation, then the repet-

¹⁸ This finding is not really surprising and probably is the least defensible in the paper. It is due to the fact that our measure of recidival rate is the weakest measure in the study.

itive rate and the conventional rate are likely to be more divergent for adult crimes than for juvenile offenses. Moreover, if professional criminals are likely to be apprehended sooner or later but continue their careers after punishment, then the recidival rate could be made a major component of conventional adult crime rates. There may also be certain kinds of crimes, such as petty theft, that virtually everyone commits sooner or later, making the categorical rate more or less constant (1.00) among adult populations but not among juvenile populations.

Given the present evidence of divergence among the four types of offense rates, criminologists who formulate theories about crime should cease speaking of *the* crime rate. That term is now understood as the conventional

crime rate, but it could well be that tests of some theories would be much more consistent with the theory if based on special rates. However, special rates can be computed only by gathering data on self-reported offenses. Such data have been gathered in the past evidently on the assumption that they are more reliable than official statistics. The present research in no way substantiates that assumption. The findings reported here do however make research on self-reported offenses all the more important, because it is only through such research that criminologists can employ special rates. Viewed that way, data on self-reported offenses are not just alternatives to official statistics; they are indispensable if criminologists are to use anything other than conventional rates in their research.