Psychological Studies of Punishment†

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The human biological sciences, through experimentation involving a variety of organisms, have amassed considerable data on the psychological aspects of punishment. Professor Singer, an experimental psychologist, analyzes the results of these studies in light of their potential applicability in the field of criminal justice administration. After examining the theories, techniques, and effects, both desirable and undesirable, of punishment, and the variables that determine its effectiveness, the author concludes that punishment, if properly administered, can effectively suppress criminal behavior and suggests some novel forms and uses of punishment to achieve that end.

Lawyers, criminologists, and penologists have recognized for some time the relevance of scientific studies of human behavior to their concerns. They have turned first to the *social* sciences—sociology, clinical and social psychology—for useful information and ideas. Those in the social sciences have responded eagerly, and this mutual enthusiasm has resulted in such innovations as consideration by the courts of sociological evidence in deciding whether segregated schools can be truly "equal," consideration by legislatures of similar evidence in framing poverty and welfare laws, the introduction into criminal trials of clinical testimony on legal sanity, and the use of social and psychological predictive indices in sentencing and correctional procedures. In some instances the contributions of the social sciences have been substantial, while in others their additions have been of mixed value. In particular, professionals in the fields of law and criminology have often been confused by contradictory testimony from experts in the social sciences and irritated by their inability to state concrete relationships with complete confidence.

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In contrast to the relationship between law and the social sciences, there has been very little interchange between law and criminology and the human *biological* sciences—zoology, physiology, ethology, experimental psychology, and behavioral genetics—which study man as one biological entity among many. Their circumscribed subject matter diminishes their surface relevance for social questions. That same limitation of subject matter, however, allows them to state basic relationships more easily than is possible in the social sciences. Insofar as it is wise and expedient for our social planners to treat man as a biological creature, the human biological sciences should have much to contribute.

The relative neglect of the biological sciences is understandable. Biological scientists have shown little interest in social applications. They have not only failed to interpret their often esoterically stated findings to social institutions that might be interested in them, but have not even made a serious attempt to convince such institutions of their science's usefulness, confining their rare statements on the social implications of biological findings to technical scientific journals. This Article, therefore, will have the following features: It will consider at length the relevance of experimental psychology for social issues, detail the facts and ideas of one of the topics of experimental psychology—punishment—in non-technical terms, and discuss concrete applications of these findings in the field of criminal justice administration. Finally, the Article is written by an experimental psychologist for the professional readership of a law review.

I

THE FRAMEWORK AND ETHICS OF EXPERIMENTAL PSYCHOLOGY

"Experimental" or "biological" psychology, as opposed to the social or clinical branches, is characterized by a concern with relatively simple and basic phenomena. Experimental psychologists study humans as well as animals, usually focusing on those characteristics which humans share with a large number of other organisms, but alloting no special distinction to the human as subject matter. They state their observations in terms of observable behaviors and, like other scientists, attempt to formulate deterministic laws, that is, laws of invariable association between events. Their hypotheses and theories either refer directly to physiological structures and physical events or have a physical-physiological tinge (as in "stimulus" and "response"). Where they mention an organism's perceptions or thoughts about a situation, it is only in abstract and mechanical terms.

There are three questions regarding experimental psychology, important to this Article, which the nonpsychologist often asks but sel-

dom receives satisfactory answers to: Is a deterministic science of behavior plausible? Can animals really tell us anything about human beings? Do explanations of human behavior in terms of stimulus and response really have any validity?

The nonpsychologist often takes exception to the deterministic statement of behavioral laws—for example, the law that punishment effectiveness decreases increasingly rapidly as punishment for an act is delayed. He argues that humans have free will and do not behave automatically as the law would imply and that the law ignores the factors which really count: human attitudes, beliefs, feelings, perceptions, morals, and the human conscience. Both exceptions are well taken in some senses, but for the purposes of this Article they miss the point. In the first place, although scientists enjoy couching their findings in deterministic form, we are not necessarily required to view their positions as ontological. Apart from philosophical disputes about free will, the above law is true as a simple matter of observable fact, and such laws are being used widely and successfully to control human behavior.[1] Second, if we do involve psychological data in philosophical disputes about free will, we find that the free will arguments are losing ground fast.[2]

The second exception—that the law ignores too much—is more important. The law does indeed ignore a great deal, everything, in fact, except the specific, isolated conditions under which it was formulated. Like any scientific law, it is implicitly prefaced by "All else being equal . . . ." While there are no doubt situations where the law does not hold true, or even where it is reversed, in general it is valid. If we want to hone our control, we can either try to make the conditions of application of our law more like the original laboratory conditions or try to find laws about attitudes and morals so that we can regulate them concurrently.

Experimental psychologists and other biological scientists derive many of their generalizations from animals. The layman often questions the biological psychologist's seemingly blind assumption that because something is true for a rat, it is true for a human. The psychologist or biologist, for his part, is so accustomed to observing phys-

1. R. ULRICH, I. STACHNIK & J. MABRY, CONTROL OF HUMAN BEHAVIOR (1966).

2. Immergluck, *Determinism-Freedom in Contemporary Psychology*, 19 AM. PSYCHOLOGIST 270 (1964); Grunbaum, *Causality and the Science of Behavior*, 40 AM. SCIENTIST 665 (1952); Boring, *When is Human Behavior Predetermined?*, 84 SCIENTIFIC MONTHLY 189 (1957). There is nothing in this approach which need contradict legal notions of "responsibility" or "diminished capacity." These notions may appropriately have the same heuristic value in law as determinism does in psychology, and may be construed as an attempt to specify the causal determinants of behavior more precisely, as when we decide whether an habitual shoplifter's behavior is determined by greed or by a neurotic compulsion.

iological and behavioral continuities along the evolutionary order that the similarities between men and the lower animals seem much more basic and obvious than the differences, and he is amused by man's disinclination to admit his animal tendencies.[3] Fortunately, even if one remains skeptical about the generality of animal results, this Article should still be meaningful. Scientists have found that most of the results to be described are demonstrable with a wide variety of species, including man. In the punishment literature, rats, cats, dogs, goldfish, pigeons, monkeys, human adults, and children have all been subjects of experimental reports. Psychologists have found few occasions to qualify the basic laws of punishment with species discrepancies, although they are attentive to such possibilities.[4]

We often have no choice about trusting the animal data, since we are dealing with questions on which it is practically impossible or unethical to do research with humans. If in tests on female monkeys a new measles vaccine causes miscarriages, researchers reject it without further testing. Monkeys are not humans, and the vaccine may be safe for humans (although this is unlikely), but we are unwilling to use humans as research subjects to find out. We know from controlled experiments that deprivation of maternal care and of sensory stimulation in infancy will cause underdevelopment of the cortex, poor learning capacities, motor impairments, and severe permanent personality maladjustments in monkeys and rats.[5] Although naturalistic observations suggest that the same is true for human infants,[6] we can never know for certain unless we experimentally control the degree of environmental deprivation for randomly selected groups of infants and at some future time assess their personalities and cortical weights. Hopefully, we will do no such thing. This being the case, parents and child care institutions have no alternative but to pay careful attention to the animal results. Some of the laws of punishment are likewise for the most part "animal laws": for instance, the law that the more

3. This topic deserves a more extensive treatment than can be given here. A number of readable current accounts give the flavor of the biologist's view. *See, e.g.*, D. MORRIS, THE NAKED APE (1967); Tinbergen, *On War and Peace in Animals and Man*, 160 SCIENCE 1411 (1968); S. CARRIGHAR, WILD HERITAGE (1965); K. LORENZ, ON AGGRESSION (1966).

4. Karsh & Williams, *Punishment and Reward in Children's Instrumental Learning*, 1 PSYCHONOMIC SCIENCE 359 (1964). *See also* B. CAMPBELL & R. CHURCH, PUNISHMENT AND AVERSIVE BEHAVIOR App. I (1969); Aronfreed, *Aversive Control of Socialization*, 16 NEB. SYMPOSIUM ON MOTIVATION 271, 308-09 (1968).

5. Krech, *The Chemistry of Learning*, 51 SATURDAY REVIEW, Jan. 20, 1968, at 48; Harlow, *The Heterosexual Affectional System in Monkeys*, 17 AM. PSYCHOLOGIST 1 (1962); Harlow & Harlow, *Social Deprivation in Monkeys*, 207 Scientific American 137 (1962).

6. Spitz, *Anaclitic Depression*, in 2 THE PSYCHOANALYTIC STUDY OF THE CHILD (1946).

severe the punishment, the more effective it is or the law that punishment will elicit aggressive behavior. We cannot experimentally verify these laws with humans to any great extent without performing unethical research. In lieu of such research, we are obliged to take the animal data into account when assigning prison sentences or planning prison plants.

Some of this Article's explanations for punishment phenomena, even though they are translations of a technical language, may yet seem strange and mechanical. The purposes and volitions we associate with our actions and those of our fellow humans are conspicuously missing. Some illustrations may demonstrate why this is appropriate for our purposes and may remove the nonpsychologist's hesitation as to the validity of explanations of human behavior in terms of "stimulus" and "response." Imagine that being from an isolated southern clime, you are unfamiliar with furnaces or with central heating, and you visit a friend in a northern climate who has both. You observe that at irregular intervals, varying with the room temperature, the furnace and the radiator begin to make clanking noises as steam flows through the pipes, and you ask your friend, "Why is the furnace doing that?" He replies, "Because it wants to keep the house warm. It's doing just what you would do if you were a good furnace." Only a few centuries ago you would have found such an answer quite acceptable and thought no more about it. Today you are not so easily satisfied. Having a scientific bent, you might begin taking careful observations of the conditions under which the furnace went on and off, and might vary the room temperature experimentally until you could formulate the precise rules of its operation. You would then consider what type of mechanism could make the furnace behave in precisely this way as a function of the observed conditions. It would not be surprising if you conceived of a thermostat. You would test this hypothesis by doing things which you thought ought to affect thermostats, and thus indirectly furnaces, and observe whether they did in fact produce the effects; or you might begin probing around inside the system, dissecting the house wiring, with the hope that you would discover the thermostat itself. With much ingenuity, patience, and luck, you would verify your theoretical thermostat explanation. You would then have a vastly increased ability to predict and control the operation of the furnace.

Now assume that you visit a laboratory where experimental psychologists are engaged in punishment studies. There you observe the following: An organism is confined in a small space which has an electric grid for a floor and which contains only a light bulb and a lever. At irregular intervals the light goes on, and soon afterwards the organism receives an electric shock. It leaps about frantically and

accidentally depresses the lever: the light and shock turn off. Very soon the organism depresses the lever as soon as the light goes on, and it no longer receives a shock. You ask the laboratory technician, "Why is the organism doing that?" He replies, "That's obvious! It doesn't like being shocked, so it presses the lever in order to avoid it. You'd do the same thing if you were in that box." Such a reply might satisfy you, as it would most people—especially if the organism in the box were a fellow human—and you might wonder why you asked such a question. However, excited by your successful experience with the furnace, you might start looking for "thermostats." After many observations, experiments, and false hypotheses, you might hypothesize the following explanatory mechanism: The light, being initially contiguous with shock, comes by a process of Pavlovian conditioning to evoke strong and unpleasant autonomic emotional responses—fear and anxiety—in the organism. When the organism presses the lever and the light disappears, the unpleasant emotional responses also disappear, strengthening the lever pressing response through reinforcement. Thus the organism comes to press the lever more and more frequently when the light comes on. If you test this explanation experimentally and it continues to fit the data, your ability to predict and control the organism's behavior is now far superior to the lab technician's.

In addition to the foregoing remarks addressed to the nonpsychologist's reservations about experimental psychology, a word about science and ethics is here appropriate. Science provides knowledge, which society can then use for good or for ill. A scientist is no more qualified than any other man to place a value judgment on particular applications of his knowledge. He can inform society about the most expedient means to given ends; but he is not particularly qualified to judge whether these expedient means are ethical or whether the ends themselves are good. This Article considers how punishment can be used *effectively* to suppress criminal behavior, which it assumes to be a desirable end. It does not assume that the use of punishment in itself is ethical or unethical. It represents data according to its relevance and importance, with ethical frameworks playing no intentional role in selection or interpretation. The Article recognizes ethical issues only in a few cases where it seems essential and discusses means of eliminating criminal behavior other than by punishment only where the desirability of other means arises naturally from the laboratory evidence. Specific recommendations fall at various points along the political spectrum. This Article does not consider whether it is good or necessary to punish wrongdoers in order to act out a social ethic. There are thorough discussions of all these issues elsewhere;[7] value

7. K. MENNINGER, THE CRIME OF PUNISHMENT (1968).

decisions are therefore left to others.

II.

EXPERIMENTAL STUDIES OF PUNISHMENT

A. Applicability

Experimental models of punishment situations are very simple and hence both basic and general. Typically an experimenter uses rewards, usually food, to induce an organism to perform a simple act, such as pressing a bar or running down an alley. When this behavior is well-learned, he punishes the organism by administering some aversive condition during or after the act, and he measures the effects of the punishment by the future frequency or strength of the behavior. Sometimes he withdraws the reward when the punishment is administered. This is termed punishment under "extinction." Information derived from such studies is potentially applicable wherever punishment is used or phenomena resulting from the use of punishment are dealt with. Thus, the information should have applications in such diverse areas as animal training, criminal behavior and penology, child rearing, and clinical psychology. In some respects the laboratory models resemble animal training—since animals are usually used for experimental subjects—and child rearing—since common types of punishing stimuli are used in both situations. With respect to the focus of concern, however, the experimental models are most similar to criminal behavior and penology in that in both instances the focus is on the suppression of behavior, whereas punishment is likely to be used for other purposes in child rearing and animal training. Perhaps the most serious difference between the punishment of criminals and laboratory models of punishment lies in the punishing stimuli used. We punish criminals by fines or by incarceration, whereas laboratory organisms usually receive short, intense stimuli, such as electric shock, slaps, or loud noises. It is difficult to assess the importance of this difference. We do know that different types of punishment generally do not alter the laboratory laws of punishment: Punishing stimuli such as slaps, buzzers, confinement in a box, shocks of different durations and intensities, and removal from the vicinity of reward, which include some fair analogues of incarceration, all produce about the same experimental results even when more than one punishment is used for the same organism in the same experiment.[8] We can

8. Church, *Response Suppression*, in B. CAMPBELL & R. CHURCH, *supra* note 4; Wagner, *Frustrative Nonreward*, in *id.*; McMillan, *A Comparison of the Punishing Effects of Response-Produced Shock and Response Produced Time Out*, 10 J. EXPERIMENTAL ANALYSIS OF BEHAVIOR 439 (1967); Leitenberg, *Is Time-Out from Posi-*

probably assume that our present experimental laboratory laws will prove valid for incarceration, although we know little about the dimensions of incarceration itself. Incarceration for six months may be much more potent in its effects than a one-month sentence, but variations in duration of confinement after six months may represent only small changes on a scale of severity; or the reverse may be true. We have no pertinent knowledge.

Experimental studies of punishment are obviously most applicable to criminal behaviors that, like the laboratory behaviors, are acquired through a simple reinforcement process, are repetitive, and are maintained because they are the most accessible routes to material rewards. We need not be directly concerned here with theories of the genesis of criminal behavior. Some theories explain criminal behavior in terms of simple learning-reinforcement models.[9] No doubt some criminal behavior develops in precisely this way; no doubt much of it does not. It seems likely that property crimes, which comprise the bulk of offenses, are more susceptible to learning theory explanations and to applications of information derived from punishment studies than are "crimes of passion," such as assault. What is perhaps more important for our purposes is to recognize that punishments are similarly administered for crimes of passion and property crimes, so that general principles of punishment ought somehow to be relevant to the former as well as to the latter. In some cases the motivation for criminal behavior may interact with the punishment administered.[10]

This Article does not consider the problem of deterrence of crimes. There are experimental analogues to deterrents, in which a child's behavior is affected by witnessing the punishment of another person for a given act,[11] but such research is done in a context different from that presently under consideration. The results discussed here will tell us how to punish a criminal after he has committed the crime so that he will not repeat it, not how to prevent him from committing it in the first place. Of course, insofar as the known conditions of punishment in fact affect deterrence, the principles discussed here will be relevant. This Article also omits, for the sake of argument, the possibility of punishment by life imprisonment for all crimes. This is obviously a completely effective suppressor of recidivism, but it is more interest-

tive Reinforcement an Aversive Event? A Review of the Experimental Evidence, 64 PSYCHOLOGICAL BULL. 428 (1965).

9. H. EYSENCK, CRIME AND PERSONALITY (1964); H. EYSENCK, *Crime, Conscience and Conditioning*, in FACT AND FICTION IN PSYCHOLOGY (1965); Jeffrey, *Criminal Behavior and Learning Theory*, 56 J. CRIM. L.C. & P.S. 294 (1965).

10. See text accompanying notes 76-77 *infra*.

11. A. BANDURA & R. WALTERS, SOCIAL LEARNING AND PERSONALITY DEVELOPMENT (1964). *See also* Church, *Emotional Reactions of Rats to the Pain of Others*, 52 J. COMPARATIVE AND PHYSIOLOGICAL PSYCHOLOGY 132 (1959).

ing as well as more practical to ask what effects punishments other than permanent incarceration might have on postpunishment behavior.

Two general problems encountered in applying scientific findings remain. First, it is sometimes difficult to set up natural conditions sufficiently similar to the controlled laboratory conditions that the laboratory principles can operate effectively without interference. This is an engineering problem especially troublesome in the behavioral sciences, since it is unethical to put a box around human beings in the same manner as we put vacuum tubes around diodes. Second, laboratory principles are framed in general and abstract terms and are derived from simple, abstract laboratory "operations." It requires considerable imaginative insight and experimentation to produce natural conditions comparable to the laboratory operations. Neither of these problems undermines the validity of the laboratory principles; they merely make the principles more difficult to apply. This Article makes a number of concrete interpretations and suggestions, based on what seem to this author to be sound analogues to laboratory operations and what seem to be practical ways of meeting laboratory conditions. Hopefully, these can at least suggest directions to take. The essential decisions on what is ethical and what is viable, however, reside with the public and the professionals in the criminological disciplines.

B. Studies of Punishment

1. Severity of Punishment

The first experimental investigations of punishment by Skinner[12] and Estes[13] in 1938 and 1944 are still among the most important. Skinner and Estes each established a strong habit of bar pressing in rats for a food reward and then extinguished this habit by withdrawing the reward. At the same time the experimenters punished bar pressing in one group of rats by electric shock or a slap on the paws. They found that after an initial reduction in the level of bar presses the punished animals "recovered" and eventually performed the same total number of unrewarded bar presses as did the unpunished rats. More severe punishments did decrease the total number of unrewarded responses somewhat, but did not decrease the time necessary for complete extinction. Estes and Skinner both concluded that punishment is ineffective in eliminating behavior, and Skinner suggested that it be eliminated as a social instrument.[14]

12. B. SKINNER, THE BEHAVIOR OF ORGANISMS (1938).

13. Estes, *An Experimental Study of Punishment*, 57 PSYCHOLOGICAL MONOGRAPHS 263 (1944).

14. B. SKINNER, SCIENCE AND HUMAN BEHAVIOR (1953).

This conclusion stood unchallenged for 20 years. It is the main, and almost the only, experimental conclusion about punishment that has entered the criminal literature.[15] This is unfortunate, because it is wrong. Recent work has repeatedly shown that both nonrewarded and rewarded behavior can be quickly, completely, and permanently suppressed by punishment, provided it is severe enough.[16] Incrementally increased severity can produce any desired degree of suppression, from negligible to absolute.[17] In fact, an organism can be made to starve to death rather than perform a food-rewarded but punished behavior.[18] In general, the punishment need not be so severe as to traumatize the organism in order to completely suppress behavior.

One wonders how everyone could have been wrong for so long. The answer, as suggested by Solomon[19] and by Holz and Azrin[20] is that psychologists are human; they do not enjoy experimenting with punishment, especially severe punishment, nor is it congenial to them to advocate punishment as a social tool. Therefore psychologists performed very little research on punishment in the two decades following the work of Skinner and Estes, and they accepted their conclusions without too much question. In the early 1960's, however, research on punishment suddenly skyrocketed. The results have already filled three volumes,[21] and research is still accelerating. The new research has modified old beliefs, and new facts are emerging monthly. The reason for this upsurge is not that psychologists have suddenly become hard-boiled; rather, they have become convinced that knowledge about punishment has widespread humanitarian uses.

The brutal fact, then, is that the more severe the punishment, the more effective it is in suppressing behavior. As has already been pointed out, however, this is no reason automatically to assign punishment bad marks. Furthermore, we have a detailed knowledge of what "severe" means in terms of the behavioral effects of electric shock on rats,[22] but we have no knowledge of what "severe" means in terms

15. J. CONRAD, CRIME AND ITS CORRECTION (1965); Appel & Peterson, *What's Wrong with Punishment?*, 56 J. CRIM. L.C. & P.S. 450 (1965); Jeffrey, *supra* note 9. In fairness to these authors it must be pointed out that they were writing for the most part just before the current research boom in the field of punishment.

16. Azrin & Holz, *Punishment*, in OPERANT BEHAVIOR (W. Honig ed. 1966); Solomon, *Punishment*, 19 AM. PSYCHOLOGIST 239 (1964).

17. Solomon, *supra* note 16.

18. *Id.*; Appel & Peterson, *supra* note 15.

19. Solomon, *supra* note 16.

20. Azrin & Holz, *supra* note 16.

21. PUNISHMENT: ISSUES AND EXPERIMENTS (E. Boe & R. Church eds. 1968); B. CAMPBELL & R. CHURCH, *supra* note 4; AVERSIVE CONDITIONING AND LEARNING (F. Brush ed.) (in preparation).

22. Campbell & Masterson, *Psychophysics of Punishment*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

of the behavioral effects of incarceration on human beings. Under the proper circumstances, a year's imprisonment might be a severe enough punishment to permanently eliminate any criminal behavior.[23]

A second lesson is that, if we administer a mild punishment, we run the risk that suppression will be only temporary and that the undesirable behavior will return in full strength when the effects of punishment have worn off or when the organism is highly motivated to perform the punished behavior.[24] Again, however, we do not know what constitutes a mild punishment for humans. The fact that a mildly punished behavior will regain its strength has caused some psychologists to think that punishment does not act directly to eliminate behavior in the same sense that extinction may be said to weaken or eliminate behavior, but that it merely suppresses behavior, eliminating it indirectly. In some theoretical sense the behavioral tendency is still there, but inhibited. This is a matter of theoretical debate, with both sides at this point just lining up their ammunition.[25] These debates, at any rate, need not cloud the significance of the empirical facts, which are quite clear: Punishment can effectively suppress behavior, provided it is sufficiently severe.

2. *The Importance of Extinction*

Extinction, or the withdrawal of reward for a behavior, will eventually eliminate that behavior. The behavior will occur with diminishing frequency until it appears only sporadically. Under no circumstances will the behavior regain any substantial strength, unless it is rewarded again. Moreover, a given intensity of punishment will suppress behavior more effectively if the behavior is also under extinction than if it is still being rewarded.[26] Since criminal behavior is almost always rewarded,[27] this suggests that we give some attention to extinguishing criminal behavior as well as punishing it, by withdrawing the rewards or making them inaccessible. Shah[28] was apparently among the first to discuss this in explicit terms:

> To take a more specific aspect of the relationship between social and environmental factors and deviant behavior, it seems evi-

23. Problems of assessing our treatment effects will be discussed later. See text accompanying footnotes 122-37 *infra*.

24. Azrin & Holz, *supra* note 16.

25. Estes, *Outline of a Theory of Punishment*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

26. Azrin & Holz, *supra* note 16.

27. It is seldom that the housebreaker finds nothing to reinforce his efforts.

28. Shah, *Treatment of Offenders: Some Behavorial Concepts, Principles and Approaches*, 30 FED. PROBATION 29 (1966). *See also* the discussion of reducing criminal opportunities in PRESIDENT'S COMM'N ON LAW ENFORCEMENT AND ADMINISTRATION OF JUSTICE, TASK FORCE REPORT: CORRECTIONS 261 (1967).

> dent that the form and frequency of certain criminal acts bears some connection to the environmental structure and opportunities provided. Thus, the relative ease with which checks may be cashed in the United States is undoubtedly related to the frequency of bad check passing and various related offenses. The relative ease with which cars may be broken into and be started without use of ignition keys, clearly affects the frequency of offenses involving 'joy-riding' and automobile theft. . . . It seems obvious that certain changes in community practices, the requirement that the vast technological skills available in the country be utilized more adequately in the manufacturing of automobiles with better door locks and less vulnerable ignition systems . . . could do much to influence the frequency of certain law violations and other undesirable social situations.[29]

Some manufacturers have in fact equipped their cars with buzzers which sound when the ignition is off and the keys are not removed and with steering columns which lock when the keys are removed. Widespread use of these devices may drastically reduce car thefts. The AC Transit Company in the San Francisco Bay Area, in order to prevent bus robberies, has pioneered an exact change fare system, in which the driver carries no cash. This has reduced the incidence of bus robberies to zero.[30] One of the most effective crime fighters of the coming decade may be generalized credit cards. If liquor stores, markets, and gas stations used credit cards exclusively, there would be very few robberies of the same. Uniformly adequate street lights would no doubt reduce muggings. Many other possibilities exist.

If such reforms are, as Shah phrases it, "obvious" and "evident," why are they not more widely instituted? First, they may not really be "obvious." They seem so common sense that it should be unnecessary for learning theorists to cite them. However, articles on behavior theory and crime have provided the context for both Shah and this author to suggest such changes, and it is possible that the obvious sometimes becomes so only from a novel vantage.

Second, those who subscribe to a hydraulic theory of criminal behavior might believe that these changes will not really decrease the total incidence of crime. They would contend that there is a constant total criminal impulse, and suppression of crime in one form will pressure it into increasing somewhere else. We might, for instance, experience a rash of crimes associated with the fraudulent use of credit cards. It seems much more reasonable, however, to assume that crimes are at least in part a function of the ease with which criminal behavior is

29. Shah, *supra* note 28, at 32.

30. Personal communication from Dennis J. O'Connor, Manager, Public Information and Advertising Department, AC Transit, Oakland, California, May, 1969.

rewarded and that we can appreciably reduce the total opportunities for successful criminal behavior in our society by a few simple reforms, thereby forcing many would-be car thieves into becoming used-car dealers.

Third, such reforms may seem mechanically inconvenient. They need not be; some may actually be more convenient, and we must balance any inconvenience against the social cost of crime. It is possible, of course, that mere inertia has impeded the institution of such reforms. The liquor store owner may regard an occasional robbery as part of the cost of doing business, just as the armed robber might consider an occasional jail sentence as part of the cost of his business.

3. *Certainty and Delay of Punishment*

The results of experiments on certainty of punishment are expected and straightforward: The more certain the punishment, the more effective it is in suppressing behavior.[31] All else being equal, punishing an act every time it is committed is the frequency condition most effective for suppression. In his article on criminal behavior and learning theory, Jeffrey[32] maintained, without citing specific evidence, that "the experimental evidence supports the classical school of criminology in its statement that it is the certainty of punishment—not the severity—that deters people from criminal acts." This is probably a misleading statement. In the first place, as mentioned above,[33] the conditions of punishment which minimize recidivism may or may not be the conditions which maximize deterrence. There is no reason to assume, in fact, that punishment is necessarily a determinant of deterrence. We have little experimental evidence on the subject. Second, this author is aware of no experimental evidence which directly compares the suppressive powers of certainty with those of severity. Indeed, such a comparison would be very difficult. The indirect evidence concerning suppression supports a conclusion different than that of Jeffrey: A sufficiently severe punishment will suppress behavior effectively even if it is only occasional, whereas a mild punishment will permit complete recovery of the punished behavior even if it is administered every time.[34] Also, Rettig and Rawson[35] found that estimates of the likelihood of unethical behavior were much more influenced by the potential intensity of punishment than by the potential probability.

The moral derived from the basic experimental results concerning certainty is nevertheless straightforward: Catch more criminals more

31. Azrin & Holz, *supra* note 16; Solomon, *supra* note 16.
32. Jeffrey, *supra* note 9.
33. See text accompanying note 11 *supra.*
34. Azrin & Holz, *supra* note 16.
35. J. ARONFREED, CONDUCT AND CONSCIENCE 39 (1968).

of the time, presumably through increasing the resources or upgrading the quality of law enforcement. Law enforcement officials would then also more quickly apprehend criminals after the commission of crimes. Experimental knowledge of the degree of suppression as a function of the percentage of total responses punished is inexact, and knowledge of how many criminal acts actually get detected and punished is lacking (although indications are that the percentage is small). Therefore, it is not possible to estimate how effective a given increase in law enforcement capacities would be. Almost any increase would be helpful, however.

Extensive experimental investigation of delay of punishment has shown that the effectiveness of punishment diminishes as it is administered from zero to five seconds after a behavior. After this point, its effectiveness in suppressing behavior drops off quite sharply, reaching a minimum at about 30 seconds, where, however, there is still some residual effect.[36] These results seem to hold true for humans as well as for animals.[37] The crucial question for criminological purposes is: Why is punishment less effective after longer delays? Is delaying a punishment similar to decreasing its certainty or to decreasing its severity? Church[38] showed that increasing the "certainty" of a delayed punishment by providing a continuous noise signal bridging the gap from behavior to punishment did not increase its effectiveness, although behavior was suppressed during the signal itself. As we therefore cannot account for the loss of effectiveness of delayed punishment in terms of its similarity to decreased certainty, it is likely that delaying a punishment has an effect equivalent to decreasing its severity. We also know that, as punishment is delayed, it is more difficult to produce effective *differences* in severity.[39] Some of this experimental work needs to be verified and extended, but the above principles are better than tentative guesses.

When the concern is suppression of a behavioral act more complex than simple bar pressing, it is more effective to punish the beginning stages of the act than to punish it when it is well under way or just completed.[40] The former produces an organism that seldom re-

36. Church, *supra* note 8. A sole exception to this rule is punishment by induced nausea, which can cause an organism permanently to shun a food eaten hours before the onset of the sickness. See Garcia, Ervin & Koelling, *Learning with Prolonged Delay of Reinforcement*, 5 PSYCHONOMIC SCIENCE 121 (1966). This supports the contention that consummatory behaviors are abnormally sensitive to punishment. See note 83 *infra*.

37. Vogel-Sprott, *Suppression of a Rewarded Response by Punishment as a Function of Reinforcement Schedules*, 5 PSYCHONOMIC SCIENCE 395 (1966).

38. Church, *supra* note 8.

39. Cohen, *Response Suppression as a Function of Delay and Intensity of Punishment*, 28 DISSERTATION ABSTRACTS 1704 (1967).

40. Church, *supra* note 8.

peats the act, but shows no anxiety after he does, whereas the latter procedure produces an organism that will repeat the act often, even though it will manifest guilt and anxiety thereafter.[41] The former is presumably preferable.

Clearly the above findings indicate that our present system of punishmcnts should be inadequate.[42] We do not usually inflict penalties within seconds of a criminal act, but after months or even years of waiting and legal proceedings. We would predict that such penalties would have little effect on behavior. Moreover, as Eysenck[43] and others have pointed out, the material rewards for crime are usually immediate, in contrast to the punishment's delay, and immediate rewards will influence organisms more than delayed punishments.

At this point we need to consider two objections. First, cannot humans look ahead farther than 30 seconds to plan for rewards or avoid aversive consequences? Second, does not Eysenck's law predict that everyone should become a criminal?

Consequences more remote than 30 seconds can affect human beings and, in fact, other organisms. However, analysis reveals that the mechanism responsible for bridging the gap is probably "secondary reinforcement" (or secondary punishment)—some signal or symbol which has been reliably associated with reward or punishment and which is present during the delay interval.[44] Such a signal will in fact suppress behavior when it is present during the delay interval, but undesirable behavior will return when it is absent.[45] Thus, such signals will not counteract over a long period of time the weakened effect of delayed punishment.

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41. Solomon, Turner & Lessac, *Some Effects of Delay of Punishment on Resistance to Temptation in Dogs*, 8 J. PERSONALITY & SOCIAL PSYCHOLOGY, 233-38 (1968).

42. We do not know whether this is true in fact. See text accompanying notes 122-37 *infra*.

43. H. EYSENCK, CRIME AND PERSONALITY (1964). Eysenck's law that immediate rewards will influence an organism much more than a delayed punishment is not quite accurate. In a series of experiments directly comparing the two, Renner (Renner & Specht, *The Relative Desirability or Aversiveness of Immediate or Delayed Food and Shock*, 75 J. EXPERIMENTAL PSYCHOLOGY 568 (1967)) has shown that punishment can reach farther back in time than reward; *i.e.*, punishment's effects do not fall off as steeply with delay as do reward's. We might say that in this respect Nature is on the side of society. However, for criminal behavior, where the rewards are actually immediate and the punishments uncertain and considerably delayed, Eysenck's law is no doubt true.

44. E. WIKE, SECONDARY REINFORCEMENT (1966); G. KIMBLE, HILGARD AND MARQUIS' CONDITIONING AND LEARNING (1961).

45. Church, *supra* note 8, at 136-40. *See also* the literature on "Conditioned Emotional Response" (CER). A brief review may be found in J. DEESE & S. HULSE, THE PSYCHOLOGY OF LEARNING (1967). A more thorough and recent discnssion is Hoffman, *Stimulus Factors in Conditioned Suppression*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

Eysenck's law does not predict that everyone will actually become a criminal, because many other considerations obtain. For instance, most people are probably deterred from criminal acts by the social stigma of "getting caught," a secondary punishment which is relatively immediate and, for most people, quite potent (almost everybody, however, does commit criminal acts at one time or another—albeit infrequently—as would be predicted by Eysenck's law[46]). Who, then will be most disposed toward criminal acts? It seems reasonable to think, as many people have,[47] that those who are relatively unaffected by secondary rewards or punishments and/or who are relatively more affected than most people by immediate rewards and punishments, are more likely to become criminals. In other words, if criminals are people who must have immediate gratification and are unaffected by secondary rewards, they will probably also be people who will be affected only by immediate punishment and unaffected by secondary symbols of punishment. There is some evidence to support this deduction.[48] To the degree this analysis is valid, it implies that immediacy of primary punishment is even more important for the criminal population than for the general population.

The possibly vitiating effect of delay of punishments for criminals has been noted several times in the criminological literature.[49] It needs to be emphasized. Delay of punishment is of paramount importance and is probably largely responsible for the apparent ineffectiveness of our current punitive systems. There are a number of things that could be done about it. First, there is no reason why the legal process following arrest cannot be speeded up to days and weeks instead of months and years. The principle impediment is lack of judges and court personnel.[50] It costs from 2000 to 4000 dollars to incarcerate a man for one year.[51] If just one man were given a sentence four or five years lighter than normal, we would have saved enough money to procure the full services of an additional judge for one year.

Criminologists have known for some time that increased severity of punishments has little effect on incidence of crimes.[52] Why does severity have little effect, in view of both common sense and the previously mentioned experimental indications that it ought to? Be-

46. H. EYSENCK, *supra* note 9.

47. *See, e.g.*, PRESIDENT'S COMM'N ON LAW ENFORCEMENT AND ADMINISTRATION OF JUSTICE, THE CHALLENGE OF CRIME IN A FREE SOCIETY (1967); Wallerstein & Wyle, *Our Law-Abiding Law Breakers*, 25 PROBATION 107 (1947).

48. J. ARONFREED, *supra* note 35, at 169.

49. H. EYSENCK, *supra* note 9; Jeffrey, *supra* note 9.

50. THE CHALLENGE OF CRIME IN A FREE SOCIETY, *supra* note 47.

51. TASK FORCE REPORT: CORRECTIONS, *supra* note 28.

52. Jeffrey, *supra* note 9.

cause the punishments are so uncertain and delayed. The effect of delay is to lessen severity, and manipulations of severity have little effect at long delays.[53] In other words, a five-year sentence beginning a year after the commission of a crime may not be as effective as a six-month sentence administered without delay. The difference between a ten- and fifteen-year sentence, if both are started after a long delay, would not mean as much as the difference between a one- or two-year sentence immediately administered.

As Jeffrey points out,[54] our own social ambivalences exacerbate the problems. We tend to react to failures to stop crime by creating severer sentences, that is, longer sentences which we assume are more severe. However, when our sentences become longer, we also tend to be more careful about assigning them, and assign them less often. With a relatively long sentence, therefore, punishment becomes even more delayed and uncertain. If the objective is to suppress criminal behavior, this is the worst possible course to take. However, new directions seem possible. If we made five years incarceration the maximum sentence for almost any crime, with the most common sentences being one year or less, we would save enough money to multiply the number of judges and legal personnel, not to mention probation and parole officers. This in turn should reduce crime, which would reduce the total incarceration budget still further. We could give each accused maximum attention immediately, and the transition from criminal act to fines or imprisonment could be smooth and rapid. Manipulations of sentence length would have more effect. These changes would not only reduce severity of punishment; they should also reduce crime.

There is yet another route suggested by the experimental results, and that is the administering of secondary, "provisional" symbols of punishment immediately upon apprehension of a suspect, preferably at the scene of the crime. This would be the optimal condition of punishment in terms of immediacy, cutting the delay to seconds, sometimes even allowing the punishment to take place before the completion of the act. Such procedures would have to fit within the limits of our traditional notions of presumed innocence, and should only follow upon substantial public confidence in the police.[55]

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53. See text accompanying note 39 *supra.*

54. Jeffrey, *supra* note 9; Campbell & Ross, *The Connecticut Crackdown on Speeding*, 3 L. & Soc. Rev. 33 (1968).

55. We could apply these procedures to highly visible crimes such as assault, looting, breaking and entering, pickpocketing, lewd behavior, purse-snatching, trespassing, theft, etc. One possibility is suggested by the recent experimental innovation by the San Francisco Police Department of "booking" suspects on the spot when apprehended for engaging in crimes such as those mentioned above. Such "bookings" are an

4. Sentencing

Experimental results disclose three other phenomena which are relevant to sentencing policies. First, we know that allowing an organism a measure of control over its punishment will decrease the effectiveness of that punishment. A given quantity of punishment which an organism has through its own efforts decreased to that amount will be less effective than that same quantity administered without the organism's having had the possibility of controlling it.[56] This suggests that for maximum punishment effectiveness we should not permit parole or "time off for good behavior." This is not to say that parole under the present penal system is harmful, or that it is not presently effective for some people, or that it may not be desirable for other reasons. It suggests that the general possibility of parole will probably decrease the effectiveness of incarcerative punishments. Thus a five-year sentence commuted to three for good behavior might have less punitive effect than a three-year sentence fully served. Moreover, if the reforms suggested above can shorten sentences, the need for parole should be lessened.

Second, strong habits are more resistant to a given punishment than weak habits. It takes a more severe punishment to produce the same effect on a long-rewarded and hence well-established behavior as would a less severe punishment on a more weakly established behavior.[57] This suggests a standard minimum sentence for a given crime with increases in sentence length depending on the strength of the criminal tendency. While this suggestion hardly seems novel, current sentencing policies base severity of sentence on previous convictions, which is not necessarily the same as strength of criminal behavior. Thus, we should punish the professional car thief[58] with a stiffer sentence than the teenage joyrider even if he and the teenager each had no previous convictions.

Finally, an "exposure effect" accrues upon repeated punishments; a given punishment quantity will become less effective with repetition.[59] Also, experience with mild (or relatively infrequent, short, or delayed)

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indictment and a notice to appear in court and carry no formal punitive implications, but they might come to have punitive effect in the same way that traffic tickets, also secondary punishments, seem to.

56. Leitenberg, *Response Initiation and Response Termination: Analysis of Effects of Punishment and Escape Contingencies*, 16 PSYCHOLOGICAL REPORTS, 569 (1965); Leitenberg, *Punishment Training With and Without an Escape Contingency*, J. EXPERIMENTAL PSYCHOLOGY 393 (1967).

57. Estes, *supra* note 13; Solomon, *supra* note 16.

58. Police records, personal investigation, the offender's own testimony, or the circumstances of the crime itself could serve as independent determinants of the strength of criminal behavior.

59. Azrin & Holz, *supra* note 16, at 393.

punishments will attenuate the effects of later more severe (or more frequent, of longer duration, or more immediate) punishments, while initial experience with a relatively more severe punishment will accentuate the effects of later milder ones.[60] If a criminal recidivates and receives the same punishment the second time, it will be less effective, merely because of previous exposure. If he receives a more severe punishment, the previous punishment will mitigate its effects, and it will be no more beneficial than the last one unless it is considerably more severe. It is impossible to frame the suggestion quantitatively, but the lesson is clear: Make repeated punishments not only progressively more severe, but progressively much more severe. Alternatively, if the initial punishment is quite severe, it should suppress behavior more in the first place, and subsequent punishments can be milder and still have the same effect. Remember that "severe" under the proper conditions may mean only a year's imprisonment, and if this is so, the second alternative seems the better one.

5. *Theories of Punishment*

Psychologists have just begun to examine seriously various alternative explanations of punishment, and, as yet, there is no favored explanation. Involved are two basic theoretical issues which in some ways overlap. The first issue is whether the mechanisms involved in punishment are very basic and general, as the processes involved in reward effects are thought to be, or whether the phenomena of punishment will require subtle and complex explanatory mechanisms. At the moment, psychologists more strongly support the first alternative.[61] The second issue concerns the nature of the relationship between Pavlovian conditioning and the production of punishment effects. There is wide agreement that Pavlovian conditioning is involved, but there are divergent views as to precisely how it is involved. Most theorists believe that when environmental stimuli or the kinetic stimuli produced by the incipient movements of the punished act (especially in the human case, we can also conceive of imaginal stimuli) are made contiguous with punishment, they take on some of the aversive properties of the punishment itself. The next time the organism begins the act, particularly in the same environment, it produces stimuli which through classical conditioning have become aversive. It is these aversive stimuli which then prevent the act from occurring. However, disagreements arise as to just how the conditioned aversive stimuli prevent the act. They might simply lessen the organism's positive motivation to perform

60. Church, *supra* note 8.

61. Rachlin & Herrnstein, *Hedonism Revisited,* in B. CAMPBELL & R. CHURCH *supra* note 4.

the act;[62] they might impel the organism to engage in incompatible behaviors;[63] the organism might learn to escape the aversive conditioned stimuli by ceasing to perform the act or leaving the environment (which would reinforce such behavior in the future);[64] or all of these events may be occurring simultaneously. A better understanding of punishment would enhance our control over its application and its effectiveness.

C. *Undesirable Consequences of Punishment and Their Prevention*

Some psychologists have issued strong general warnings against the use of punishment, because of some of its undesirable side effects.[65] Such general negative recommendations seem more justified in the context of child rearing than in the context of punishment of criminals and actually are not very cogent even for child rearing.[66] However, it will be useful to examine all of the known inexpedient or unpleasant consequences of punishment in order to determine explicitly whether or not they relate to criminal behavior and, if so, to suggest how we might avoid them.

When punishment for an ongoing rewarded behavior is removed, the rate of occurrence of the behavior will suddenly increase. The increase is often so dramatic that the behavior for a time actually occurs at a higher rate than before it was punished. This phenomenon—"compensatory recovery"— will take place even if the punishment was mild and the behavior during punishment had already recovered completely to pre-punishment levels. When the punishment is removed, the behavior will spurt suddenly to an above-normal peak, then gradually return to normal.[67] One is struck by the similarity between the phenomenon of compensatory recovery and the fact that the greatest proportion of recidivism occurs within a year after release from prison.[68] These facts suggest that we should forcibly remind an offender, whether or not he is a parolee, of the possibility of punishment for a time after leaving prison. Punishment or its symbols should not end abruptly. For instance, we could require all offenders to visit a parole officer fre-

62. Estes, *supra* note 25.

63. Seward, *The Role of Conflict in Experimental Neurosis*, in B. CAMPBELL, & R. CHURCH, *supra* note 4.

64. Fitzgerald & Walloch, *Resistance to Extinction of a Punished Wheel-Turning Escape Response in Rats*, 68 J. COMPARATIVE & PHYSIOLOGICAL PSYCHOLOGY 254 (1969).

65. E. HILGARD & R. ATKINSON, INTRODUCTION TO PSYCHOLOGY 242-43 (1967); Azrin & Holz, *supra* note 16; Appel & Peterson, *supra* note 15.

66. See Aronfreed, *supra* note 4, for a very thorough review of punishment in child rearing. *See also* J. ARONFREED, *supra* note 35.

67. Azrin & Holz, *supra* note 16.

68. 1967 UNIFORM CRIME REP. 41.

quently for the crucial year after prison, or we might employ "half-way houses" to accomplish the same end.[69]

The administration of punishment to an organism for a continuing rewarded behavior will increase that organism's resistance to extinction. That is, it will continue performing the act longer when it is no longer rewarded or punished than if it had not been punished originally.[70] Apparently the emotional and other consequences of punishment are very similar to the consequences of removal of reward, and the initial exposure to punishment inures the organism to the later effects of nonreward under extinction.[71] This suggests that the punished criminal would tend to persist longer in a criminal act when its benefits were removed than would the nonpunished criminal. This does not seem to have important practical implications, however, since extinction is not a commonly employed method of dealing with crime,[72] since the experimental effects referred to are slight, and since the phenomenon would occur in any case only when the punishment was insufficient to suppress the original behavior, a circumstance which we presumably would be able to prevent.

Judson Brown in 1947 first observed a paradoxical and striking effect which punishment occasionally causes: If an organism performs an act in order to avoid or escape punishment, and one removes the punishment from which it had learned to escape (extinction condition) and punishes the organism instead *only if it performs the now unnecessary act*, it will persist in performing the act, thereby unnecessarily punishing itself, far longer than an organism from which all punishment is simply removed. This "self-punitive behavior" or "vicious circle effect" also occurs when the punishment used in extinction is of a different type from the punishment originally used to motivate the behavior. Furthermore, the more severe the punishment given for the unnecessary act, the longer the organism persists in performing it.[73] The probable explanation for this effect is that the punishment in extinction helps to maintain the same anxieties and fears from which the organism originally attempted to escape. The more one punishes it, the more the punishment "reminds" the organism of the aversiveness of the entire situation, and it performs the original

69. P. KEVE, IMAGINATIVE PROGRAMMING IN PROBATION AND PAROLE (1967).

70. Fowler, *Suppression and Facilitation by Response Contingent Shock*, in AVERSIVE CONDITIONING AND LEARNING, *supra* note 21.

71. Wagner, *Frustrative Nonreward: A Variety of Punishment*, in B. CAMPBELL & R. CHURCH, *supra* note 4. *See also* Brown & Wagner, *Resistance to Punishment and Extinction Following Training with Shock or Non-Reinforcement*, 68 J. EXPERIMENTAL PSYCHOLOGY 503 (1964).

72. See text accompanying notes 26-30 *supra*.

73. Fowler, *supra* note 70; Brown, *Factors Influencing Self-Punitive Behavior*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

behavior to escape from punishment; this, however, induces further punishment.[74]

This suggests that if the desire to escape from fears and anxieties motivates criminal acts, punishment for those acts might only induce their repetition. Drug addiction and alcoholism seem to be illustrative of this phenomenon. The original motivation for taking drugs or alcohol may not have been a desire to escape from or avoid tensions produced by the environment (although in many cases it probably was). An addict or alcoholic, however, is a person in whom drugs or alcohol have set up their own recurring physiological tensions, which the person must then take drugs or alcohol to avoid. His addictive behavior is entirely motivated by the desire to avoid or escape aversive withdrawal symptoms. Punishing him should make the situation worse, and it seems to. Recidivism rates for alcoholism and drug addiction offenses are very high.[75] The punishment commonly used, incarceration and withdrawal from the drug, sets up exactly the same situation that the addict took drugs or alcohol to escape. Any future signs of such punishment should drive him to further addiction. As an act of humanity, correction officials may give an addict drugs or drug substitutes during his initial stay in jail or before his court appearance. The addict is thus being punished while he is actually performing the formerly criminal act. For the normal reward-motivated criminal behavior, this would be the best possible course; for the addict such treatment may be disastrous. It may only heighten his motivation to perform the act. Therefore punishment of alcoholics or addicts by incarceration may be worse than useless.

Punishment involves fear, anxieties, pain, and unpleasantness. As we have noted, it probably suppresses behavior by conditioning these aversive reactions to situations, people, or incipient acts. For this reason psychologists have warned parents that they should punish their child sparingly and not by physical means.[76] Otherwise, the parent as punisher may become himself a conditioned aversive stimulus for the child. Such an admonition might sensibly pertain to child rearing, but it seems inappropriate for controlling criminal behavior. To be effective in suppressing behavior, punishment must be unpleasant, and it must create some fractional unpleasantness in future situations. If because of the punishment he has received, a punished criminal now feels fearful and uneasy in the presence of parole officers, courts, or police, or feels anxious when he even thinks about committing a crime,

74. Brown, *supra* note 73.

75. *See generally* 1967 UNIFORM CRIME REP.

76. G. KIMBLE & A. GARMEZY, PRINCIPLES OF GENERAL PSYCHOLOGY 252-53 (1963); H. LINDGREN, D. BYRNE & L. PETRINOVICH, PSYCHOLOGY 58-59 (1966).

we do not believe that we have grievously damaged his social adjustment.

If we place two organisms in an enclosed space and arbitrarily punish them, they will attack each other. This phenomenon—termed "elicited aggression"—occurs with a wide variety of punishments and organisms, including children.[77] In a more common punishment situation, punishment administered for an act such as bar pressing initially results in a brief flurry of bar depressions, which may be interpreted as an aggressive reaction.[78] Elicited aggression is a serious undesirable consequence of punishment and may be an experimental analogue of the prisoner's hatred of society, his desire to get back at it. It may also explain the frequency and level of prison tensions and riots. However, it may be possible to avoid it by countermeasures discussed below.[79]

In a series of classic demonstrations Maier[80] presented rats with an insoluble problem and forced them to continue to attempt to solve it. He punished the rats for half of their responses no matter what they did by forcing them to jump into a closed door. In this situation the rats "fixated" on one response, such as always jumping to the left side. Maier later made the problem soluble, but the rats persisted in their compulsive responses even though this meant always being punished when a nonpunished, rewarded alternative was readily available. Unavoidable punishment caused compulsive, neurotic behavior, and when the opportunities for more rational behavior became available, punishment was ineffective in helping the rats to overcome their neurotic tendencies.[81]

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77. Azrin & Holz, *supra* note 16.

78. Weiss & Strongman, *Shock-Induced Response Bursts and Suppressions,* 15 PSYCHONOMIC SCIENCE 238 (1969); B. SKINNER, *supra* note 12, at 151.

79. See text accompanying notes 86-94 *infra.*

80. N. MAIER, FRUSTRATION (1949).

81. Masserman (J. MASSERMAN, BEHAVIOR AND NEUROSIS (1943)), in another classic series of experiments, showed that various punishments administered to cats and monkeys at the moment before the ingestion of food would traumatize them so severely that they would later panic at the sight of food and would commonly starve to death before eating again. Solomon (Solomon, *supra* note 16) has remarked that such traumas as a result of punishment seem to be surprisingly characteristic of consummatory behaviors and has obtained similar results with dogs (Solomon *et al., supra* note 41). However, Solomon's conclusion has been challenged (Seward, *supra* note 65) and the interaction of punishment with consummatory behavior is presently in doubt (but see note 35 *supra*). In any case, such results seem to have little bearing on treatment of criminal behaviors, since eating or drinking are seldom criminal offenses, and in any case the offender is not punished at the moment of ingestion.

There are some experimental results to the effect that when a habit is very strong, punishment may tend to fixate it and make it difficult to unlearn or reverse when it is desirable to do so (Lohr, *The Effect of Shock on the Rat's Choice of a Path to Food,* 58 J. EXPERIMENTAL PSYCHOLOGY 312 (1959); Farber, *Response Fixation Under Anxiety*

Recently, Maier, Seligman, and Solomon[82] have reported extensively on a phenomenon termed "learned helplessness." If one inflicts unavoidable, random punishment upon an organism, it appears to learn that escape-oriented behavior is futile, and it will be retarded in learning a later behavior which will allow it to terminate aversive stimulation. This is apparently a phenomenon of wide generality, having been demonstrated with a variety of punishments and species, including man.[83]

A single causal texture is common to all of the adverse side effects of punishment mentioned above: The infliction of punishment on an organism in a situation where it cannot help what it is doing, for a variety of reasons, or where it has no unpunished alternative route to reward. This causes the organism to become aggressive, compulsive, phobic, retarded, or neurotic, depending on slight alterations in the punishment circumstances. This by itself suggests that we should not punish peoples' behavior without providing them with some alternative behavior through which they can escape punishment and/or secure reward. Moreover, a mass of independent evidence suggests that this is not only desirable and necessary, it is more effective as well.

Holz and Azrin[84] report that when presented with two levers, both leading to reward when pressed but one leading also to punishment, the organism—pigeon or human—will quite quickly, without overt signs of emotion, learn to press the nonpunished lever and will seldom if ever return to the punished lever. Hunt and Brady[85] have shown that controllable or avoidable punishment causes less overt emotional behavior than unavoidable punishment. Solomon[86] and Fowler and Wischner[87] report that when one punishes an organism for choosing the wrong (nonrewarded) alternative in a maze, it quickly learns the right alternative, with no apparent adverse effects. In these situations, then, with a rewarded alternative available, punishment is not only a highly effective suppressor of undesirable behavior, with no apparent concomitant ill effects, it is a valuable aid to learning. Rach-

and Non-Anxiety Conditions, 38 J. EXPERIMENTAL PSYCHOLOGY 111 (1948)). There are as yet few experimental results showing the phenomenon, so its existence, causal conditions, and importance are still in doubt.

82. Maier, Seligman & Solomon, *Pavlovian Fear Conditioning and Learned Helplessness*, in B. CAMPBELL & R. CHURCH, *supra* note 4; Seligman, Maier, & Solomon, *Unpredictable and Uncontrollable Aversive Events*, in AVERSION CONDITIONING AND LEARNING, *supra* note 21.

83. Maier, Seligman & Solomon, *supra* note 82, at 333-35.

84. Azrin & Holz, *supra* note 16.

85. Hunt & Brady, *Some Effects of Punishment and Intercurrent "Anxiety" on a Simple Operant*, 48 J. COMPARATIVE & PHYSIOLOGICAL PSYCHOLOGY 305 (1955).

86. Solomon, *supra* note 16; Solomon *et al.*, *supra* note 41.

87. Fowler & Wischner, *The Varied Functions of Punishment in Discrimination Learning*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

lin[88] has shown that manipulations of various aspects of punishment, such as severity, have relatively greater effect on behavior when a rewarded alternative is available. In fact, Fowler and Solomon *et al.*[89] have demonstrated that even delayed punishment will suppress behavior and aid learning when an alternative is available. Various persons have likewise shown that an enforced "time out" from reward as punishment for a behavior, one of the closer experimental analogues to incarceration, is effective in suppressing behavior *only* if a rewarded alternative is present, and then it is very effective.[90]

Some interesting physiological evidence indicates that avoidable punishment has much less severe emotional and psychosomatic consequences than unavoidable punishment. Miller and Weiss[91] found fewer ulcerations and other psychosomatic symptoms in animals receiving avoidable punishment than in animals receiving the same amount of unavoidable punishment. Seligman *et al.*[92] repeated these observations, with humans as well as animals. In fact, the typical finding is that organisms receiving punishments they know how to avoid, if they so choose, will be more like wholly unpunished control organisms than like the organisms receiving unavoidable punishment.

This cumulative evidence points directly and overwhelmingly to the importance of combining rehabilitation with punishment. Our correctional system *must* provide offenders alternative routes and skills to obtain the rewards that they formerly obtained only, or much more easily, through crime. Notwithstanding the institution of all of the other reforms previously suggested, the prisons would continue to produce powder kegs instead of refurbished citizens unless there were adequate rehabilitation. Furthermore, the combination of rehabilitation and punishment will suppress criminal behavior much more effectively than punishment alone, even when punishing conditions are not optimal. Punishment without rehabilitation may be a dangerous and ineffective course; their combination, however, may diminish hostilities and neuroses while effectively reducing crime.

III

NOVEL FORMS AND USES OF PUNISHMENT

Incarceration, or at least its widespread use, is a relatively recent

88. Rachlin, *The Effect of Shock Intensity on Concurrent and Single-Key Responding in Concurrent Chain Schedules*, 10 J. EXPERIMENTAL ANALYSIS OF BEHAVIOR 87 (1967).

89. Solomon *et al.*, *supra* note 41; Fowler, *supra* note 70.

90. Azrin & Holz, *supra* note 16, at 391-92.

91. Miller & Weiss, *Effects of the Somatic or Visceral Responses to Punishment*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

92. Seligman, Maier & Solomon, *supra* note 82.

form of punishment. We do not know whether it is more or less effective than other types of punishment. We think it is relatively humane, at least in theory, but this is also questionable. Experimental studies have demonstrated the plausibility of alternative forms and uses of punishment.

If one rewards an organism with food every time it presses a lever and also sets up a visual counting device which shows it how many rewards it has accumulated, and then instead of administering a directly aversive stimulus every time it presses the lever, one shows on the counter that it loses a reward for every press, the organism quickly stops pressing the lever. Such punishment is as effective as intense electric shock. Psychologists have demonstrated this phenomenon—termed "response cost"—with humans.[93] It suggests that, if the reward is in apples and the punishment in oranges, the punishment will not be as effective as when it is in the same modality as the reward which motivates the act in question. While this principle is perhaps an overgeneralization from the response cost results, some criminological data supports it: it may be for this reason that the revocation of licenses and other driving privileges is more effective than fines in suppressing traffic violations.[94] We currently fine traffic law violators and incarcerate those convicted of property crimes. The response cost results suggest that the reverse might be more effective. Part of the punishment for property crimes might be restitution to the victim and payment of an identical amount to the state. Of course, this would not always be a viable punishment, but we could institute some similar general policy. Speeding is a very exciting and dangerous form of lawlessness. Rather than fining the speeder, we could immediately impound his car, requiring him to walk, and return his car in a month. License suspension would be a similar but probably less effective punishment, since it would be delayed. If response cost methods of punishment are to be used, however, we should keep in mind the importance of rehabilitation and alternative routes to reward.

Aversion therapy is another potentially useful form of punishment. Aversion therapy is a behavioral therapy treatment[95] which uses

93. Azrin & Holz, *supra* note 16; Weiner, *Some Effects of Response Cost Upon Human Operant Behavior*, 5 J. EXPERIMENTAL ANALYSIS OF BEHAVIOR 201 (1962); A. BANDURA, PRINCIPLES OF BEHAVIOR MODIFICATION 341-46 (1969).

94. TASK FORCE REPORT: CORRECTIONS, *supra* note 51, at 78. On an anecdotal level, is it more effective to scold or spank a child for abusing his toys, or to temporarily take the toys away from him until he will play with them properly?

95. Behavior or reinforcement therapy is a clinical treatment based on learning principles. Criminologists and penologists have recognized its potential for some time, and some correctional institutions have begun behavior oriented programs. See Hutchinson, *Behavior Theory, Behavior Science and Treatment*, 10 CANADIAN J. CORRECTIONS 388 (1968); Konietzko, *Psychological Aspects of Institutional Incentive Sys-*

aversive stimuli or punishments and is based upon Pavlovian conditioning. The therapist joins the stimulus or act which the patient must learn to avoid or suppress contiguously in time and space with some noxious stimulus, such as electric shock or induced nausea. After a few pairings the to-be-avoided conditioned stimulus will evoke reactions similar to those produced by the noxious unconditioned stimulus, so that the patient will have a strong inclination to avoid the conditioned stimulus.[96]

Studies of punishment obviously have much to contribute here. Many attempts at aversion therapy have been unsystematic and without adequate theoretical base in the punishment and learning literature.[97] Recent punishment studies which should be relevant include demonstrations of the importance of punishing the initial stages of an act,[98] findings on the conditions under which aversive reactions conditioned to one stimulus will generalize to other similar stimuli,[99] and a demonstration that such conditioned aversive reactions will persist undiminished for at least four years.[100] Lovaas[101] has dramatically improved the behavior of psychotic children by punishing their aggressive and violent acts. All of these findings pertain to problems often encountered in aversion therapy and should be helpful.[102]

Criminological discussions of aversion therapy have focused almost exclusively on only a few crimes of a "clinical" nature—gambling, sex-

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tems, 47 PRISON J. 43 (1967); Shah, *Treatment of Offenders: Some Behavioral Concepts, Principles, and Approaches*, 30 FED. PROBATION 29 (1966).

96. An excellent review of aversion therapy may be found in the *Miami Symposium on the Prediction of Behavior 1967*. Bucher & Lovaas, *Use of Aversive Stimulation in Behavior Modification*, in M. JONES, MIAMI SYMPOSIUM ON THE PREDICTION OF BEHAVIOR 1967: AVERSIVE STIMULATION (1968). *See also* S. RACHMAN & J. TEASDALE, AVERSION THERAPY AND BEHAVIOR DISORDERS (1969). Discussions and examples of aversion therapy are also frequent in the criminological literature. Vietor, *Conditioning as a Form of Psychotherapy in Treating Delinquents: Some Data from the Literature*, 7 EXCERPTA CRIMINOLOGICA 3 (1967); Kushner & Sandler, *Aversion Therapy and the Concept of Punishment*, 4 BEHAVIOR RESEARCH AND THERAPY 179 (1966). An interesting aspect of such discussions is the parallel which has been drawn between aversion therapy procedures and the normal processes by which guilt or conscience may be said to develop. *See, e.g.*, Vietor's discussion of Eysenck's ideas about the growth of conscience; Bucher & Lovaas, *supra* note 96. Solomon and Mowrer have also written extensively on the conditioning of guilt and conscience.

97. Bucher & Lovaas, *supra* note 96.

98. Solomon *et al.*, *supra* note 41.

99. Hearst, *Aversive Conditioning and External Stimulus Control*, in B. CAMPBELL & R. CHURCH, *supra* note 4.

100. Hoffman, *supra* note 45.

101. Bucher & Lovaas, *supra* note 96. *See also* Lovaas' motion picture, "Teaching Mute and Echolalic Children to Speak" (Appleton-Century-Crofts 1969).

102. Birnbrauer, *Generalization of Punishment Effects—A Case Study*, 1 J. APPLIED BEHAVIOR ANALYSIS 201 (1968).

ual aberrations, drug addiction, and alcoholism.[103] This concentration is no doubt due to the fact that so far only clinical practitioners in psychology and psychiatry have performed aversion therapy, and cases involving armed robbery or trespassing would not ordinarily come within their purview or be of much interest to them. However, there is no reason why one could not use aversion therapy to treat armed robbery or any other crime as easily as homosexuality. The only requirement for treatment is that the crime involve some specific stimulus to which an aversion can be conditioned. A large variety of crimes, such as assault, vandalism, arson, pickpocketing, voyeurism, armed robbery, and shoplifting, meet this requirement. One noteworthy example of such treatment could serve as a model.

Kellam[104] describes the case of a woman in Wales who was an habitual shoplifter. She had been shoplifting for years and had served several prison sentences. Neither the prison sentences nor conventional clinical treatments suppressed her shoplifting. The initial aversion therapy—shocking the patient while she removed small items from a table—failed. The woman reported that the situation held little reality for her. The therapist then repeatedly showed the patient a treatment film in which a woman entered a cooperating store while a number of people in the store overtly watched. When the woman then shoplifted several items on a counter, the film showed expressions of horror and disgust on the faces of those watching. At the moment the woman in the film shoplifted the items, the therapist shocked the patient. Hospital personnel (nuns) administered the treatment. This treatment was successful. The patient finally stopped shoplifting, and she reported uneasy feelings of being watched whenever she entered a store. The therapist planned to repeat the treatment every few months.

This example illustrates most of the advantages, problems, and principles of aversion therapy as applied to criminal behavior. First, the therapist had to make the treatment very realistic in order to overcome the patient's difficulty in generalizing from the laboratory treatment to the normal environment. While rules can guide the efficiency of such generalization,[105] the clinical insight of the therapist and the cooperation of the patient are critical here. Second, the concerned sector of the community—the store—cooperated in making the treatment realistic and helpful. Third, the treatment conditioned the incipient stages of the act—entering the store. This was probably an important aspect of treatment. Fourth, the patient's criminally mal-

103. Treatment consists, for example, of associating shock with pictures of nude males for male homosexuals, or associating alcohol with severe nausea for alcoholics.

104. Kellam, *Shoplifting Treated by Aversion to a Film*, 7 BEHAVIOR RESEARCH & THERAPY 125 (1969).

105. Hearst, *supra* note 99.

adjusted behavior was limited in scope. She only shoplifted. Unlike many other criminal offenders, she did not also embezzle or rob grocery stores. Fifth, technical personnel administered the treatment. The procedures of behavior and aversion therapy are very simple. It takes a behavior therapist to set up an effective individual program, but almost anyone can quickly learn to administer it. Sixth, no one really knew how long the treatment would be effective. It might have lasted only a few months[106] or a lifetime. Since stores are such common environmental objects, extinction might soon set in.[107] As a precaution, the therapist scheduled the patient for regular booster sessions. Seventh, after the treatment the patient felt nervous and uneasy when she entered a store, which is certainly a personal handicap, though not as great as her previous affliction. This is part of the price of successful aversion therapy.

One can treat almost any criminal behavior in a similar manner. Particularly when working with a prisoner serving a sentence of a year or more, the behavior therapist would have time to discover the most effective treatment, and having found it, he could make the conditioning thorough. The program might require community cooperation. For example, a large banking enterprise could establish a branch office for the aversive conditioning and testing of bank robbers. Correction personnel could administer most of the program. Given the time and the resources, a behavior therapy program could make a bank robber want to vomit every time he saw a bank, could make an armed robber shudder every time he saw a gun.[108] As experimenters have successfully conditioned verbal and imaginal stimuli,[109] such a program could also induce these reactions whenever the convicted thief even thought or talked about guns and banks. The program could include booster treatments after prison whenever needed. Afterwards, the offender should probably do his banking by mail.

There is one important qualification to the foregoing conclusions: In most aversion therapy cases, including the shoplifting example above, the behavior is of a compulsive nature, and the client genuinely wants to end it. It seems reasonable that aversion therapy would most effectively suppress criminal behavior where the offender genuinely wants to reform but needs help. It should, however, also be a valuable adjunct to other forms of punishment and treatment with

106. Bandura (A. BANDURA, *supra* note 93, at 346-48, 508-09) is optimistic about the potential durability of such treatments, given the proper procedures. See also note 100 *supra.*

107. Bucher & Lovaas, *supra* note 96.

108. Very similar proposals have been made by J.V. McConnell in his article *Criminals Can be Brainwashed—Now*, 3 PSYCHOLOGY TODAY 14-18, 74 (1969).

109. Bucher & Lovaas, *supra* note 96.

less cooperative subjects. While a voluntary aversion therapy program would probably be most effective, involuntary treatment could also work.[110] Such therapy could be part of a regular sentence or an alternative to it.

Aversion therapy is very new and should see some rapid improvements in the next few years. An especially promising development is N.E. Miller's[111] recent demonstration that characteristics of the autonomic nervous system—which controls our emotional reactions—respond in normal fashion to reward and punishment. Miller suggested possible therapeutic uses of his findings,[112] and Johnson and Schwartz[113] demonstrated such uses in conditioning the emotional levels of college students. This has some interesting implications when considered along with Eysenck's analysis of criminal behavior as being characteristic of extroverts, who in turn owe their extroverted-criminal behavior to an overactive autonomic nervous system.[114] If Eysenck's analysis is valid, we can condition criminal behavior out of existence simply by punishing any above-normal activity of the criminal's autonomic nervous system. While this may be an overstatement, it seems probable that many violent crimes are due to bad temper—in technical terms, a hyperactive autonomic nervous system. Miller's results suggest that we may be able to diminish fits of temper and violence simply by punishing their nervous system components and rewarding more suitable nervous activity.

As noted above,[115] theories of punishment postulate that punishment works by conditioning aversive reactions to behavior-produced stimuli or to environmental stimuli. Environmental stimuli become

110. Bandura's (A. BANDURA, *supra* note 93, at 317) comments on the perception of punishment in a treatment context are relevant here, and are also pertinent to the previous discussion of the importance of rehabilitation.

111. Miller, *Learning of Visceral and Glandular Responses*, 163 SCIENCE 434 (1969).

112. *Id. See also* Cara, *Learning in the Autonomic Nervous System*, 222 SCIENTIFIC AMERICAN 30 (1968). An equally promising and related development is Kamiya's demonstration of conscious control over brain waves, which in turn affect serenity of emotions. *See, e.g.*, Kamiya, *Conscious control of brain waves*, 1 PSYCHOLOGY TODAY 56 (1968).

113. Johnson & Schwartz, *Suppression of GSR Activity Through Operant Reinforcement*, 75 J. EXPERIMENTAL PSYCHOLOGY 307 (1967). *See also* Shapiro *et al., Effects of Feedback and Reinforcement on the Control of Human Systolic Blood Pressure*, 163 SCIENCE 588 (1969).

114. H. EYSENCK, *supra* note 9. For chemical control of criminal neural functioning, see Schacter & Latane, *Crime, Cognition and the Autonomic Nervous System*, NEBRASKA SYMPOSIUM ON MOTIVATION 221-27 (D. Levine ed. 1964). Delgado, in a forthcoming issue of BRAIN, BEHAVIOR AND EVOLUTION, describes how a computer monitored and selectively reinforced the brain activity of chimpanzees so that they became unusually placid.

115. See text accompanying notes 61-64 *supra*.

especially important as the punishment becomes delayed, since they are the only stimuli which are always present and therefore always contiguous with punishment. Punishment can be somewhat effective at long delays if a rewarded alternative is present, but the punishment then is probably largely dependent on conditioning to the environment, and if the environment were changed the suppressive effects of punishment could dissipate.[116] Prison is at present not only a delayed punishment, it is also as removed from and unlike the normal community environment as seems possible. On this basis alone we would predict that prison would be almost totally ineffective, and there is little if any evidence to contradict this assertion. As alternatives or adjuncts to shortening the delays between crime and punishment, we could either make prison more like the community or punish criminals in the community rather than in prison. The second alternative seems far more practical and potentially effective. There is currently much enthusiasm for community treatment programs,[117] and some evidence of their success.[118] Their success may be due to the factors discussed here.

What forms should punishment in the community take? It should be punishment both in and by the community, and the criminal should develop aversive reactions to courthouses, police, symbols of authority, and probably also to the disapproving frowns and moral censure of his fellow citizens. There are numerous possibilities for specific forms, and it is difficult even to speculate as to which would be most effective or would have the least damaging side effects. We could severely curtail the offender's liberties and privileges, or require him to report frequently to police and parole officers, or to work in the community during the day but return to prison at night. We might draw from "primitive" societies and customs, from times and places without prisons. Thus, we might require the offender to make a public apology to his victim who would then ceremoniously forgive him,[119] or require him to wear a "scarlet letter." We might revive stocks and dunkings. Some of these treatments are in many respects more humane than prison, and they might be more effective.

IV

CRIMINOLOGICAL RESEARCH

This Article's general and specific suggestions for improving the effectiveness of criminal punishments are extrapolations from exten-

116. Solomon *et al.*, *supra* note 41.
117. TASK FORCE REPORT: CORRECTIONS, *supra* note 51.
118. *Id.*
119. *See* M. MEAD, COMING OF AGE IN SAMOA (1928).

sive laboratory research, involving both animals and humans, the results of which constitute our current basic scientific knowledge about punishment. All else being equal, they should indicate the right directions. If we are unable or unwilling to do actual field research with criminals, we are especially obliged to pay careful attention to the laboratory results. However, a monkey is not a completely satisfactory analogue of a bank robber, nor is a laboratory experiment, even with humans, infallibly indicative of what will happen when the results are widely applied. Therefore, to the extent that it is ethically permissible and practically possible, we must test and validate these suggestions through empirical applied research, measuring the results of their implementation. Also, where a number of suggestions are available field research is the only means of deciding among the various alternatives.

A strong tradition of research, of rigorous testing of methods, treatments, and ideas, does not exist in the criminological disciplines. As this may be due to sound ethical and practical considerations,[120] critical comments by a member of another discipline, who cannot fully appreciate the research problems in criminology and penology, may be out of order. But an obtuse gaze, which is sometimes more revealing, might result in contribution.

While the criminological literature frequently mentions the importance of research,[121] it does not treat research as seriously as it might. For instance, as to corrections the most important question at present is, "What is the effect of prison (and comparable treatments) on recidivism?" Meyer,[122] writing in a criminological journal, states offhandedly in a footnote that we know nothing about this: "But statistical studies are not completely accurate, for there is no way of measuring the rate of recidivism had there been no punishment, or the number of persons who never entered into the life of crime because of their fear of punishment." While we in fact do know almost noth-

120. Minutely inadequate research funding and lack of public interest in such research, for instance, are two important variables over which professionals in the criminological fields have no control. Also mentioned by the *President's Commission Report* (*supra* note 47) are defensiveness and inertia on the part of criminological professionals, a simple lack of trained research personnel, and the indifference of higher education to criminological problems. "Technology transfer" is also cited by Kramer in his article *Criminal Justice R & D: New Agency Stresses Police Over Corrections*, 163 SCIENCE 588 (1969), which is an excellent review of the current status of criminological research and its associated problems.

121. J. CONRAD, *supra* note 15; Shah, *supra* note 28; *Special Issue: Research*, 18 YOUTH AUTHORITY Q. (1965). Cressey has been most emphatic and detailed about the problems discussed below in his article, *The Nature and Effectiveness of Correctional Techniques*, in L. HAZELRIGG, PRISON WITHIN SOCIETY 349-74 (1968).

122. Meyer, *Reflections on Some Theories of Punishment*, 59 J. CRIM. L.C. & P.S. 595 (1968).

ing about the effect of prison on recidivism, the lack of general dismay at this state of affairs is surprising, since the research questions should have been asked and answered by Hammurabi.

There have been over 100 studies on the effects of prison and other treatments on recidivism.[123] However, nearly all have employed woefully inadequate matching designs, selecting subjects "ex post facto" from different treatments on the basis of their similarity in supposedly relevant characteristics. Although the difficulties involved in extracting causal relationships from such research are immense, if not insuperable,[124] the tendency to use such designs continues.[125] Regardless of how much we match, we cannot match on the presumably nonrandom factors used by courts in determining which criminal will receive which treatment, and these may be the determinative factors. This is a confounding factor in all such ex post facto research. An additional confounding "subject" factor, however, exists in criminological studies. If the courts may alternatively assign juveniles to a residential group therapy (or forestry camp, etc.) treatment program or to a normal reformatory, the courts will generally assign the more well-behaved juveniles or those from higher socioeconomic classes to

123. Bailey, *Correctional Outcomes: An Evaluation of 100 Reports*, 57 J. CRIM. L.C. & P.S. 153 (1966).

124. B. UNDERWOOD, PSYCHOLOGICAL RESEARCH (1957); D. CAMPBELL & J. STANLEY, EXPERIMENTAL AND QUASI-EXPERIMENTAL DESIGNS FOR RESEARCH (1963). An ex post facto matching design attempts to overcome an initial non-random selection of experimental and control groups. Because of known differences in recidivism tendencies among socioeconomic and racial groups, or because of biases along dimensions that we may or may not actually have evidence on, courts will tend to send middle-class, well-educated Caucasians to liberal treatment programs and ghetto juveniles to prison or to a reformatory. Given this initial difference in population, we can not then simply compare the total recidivism rate of prison releases with that of forest camp graduates and imagine that this will tell us something about the effects of the two programs rather than the different tendencies of the two populations who were selected for the programs, tendencies which they possessed to begin with. A matching design attempts a valid comparison in this situation by finding subjects in the two programs who happen to be "equal" on indices such as education, social class, etc., which are known to be related to crime, and assuming that these subjects constitute initially equivalent groups. A serious difficulty with this procedure, however, is that we do not know many of the factors which affect criminal tendencies, and even if we match on numerous relevant indices, we may have missed some relevant ones, and these may have been just those factors used by the courts in differentially assigning subjects. The courts do not keep explicit records detailing the basis of their assignment, and the basis of assignment may be unknown even to them. Thus a particular judge may unconsciously tend to assign juveniles to different treatments on the basis of personality, appearance, or manners, which would not be expected to come to the researcher's attention. Nor would they ordinarily match on these factors. Yet these factors may be important determinants of criminal behavior. A matching design in this case, then, would be futile and harmfully misleading. There is no way to completely overcome such difficulties in ex post facto matching designs.

125. Scarpitti & Stephenson, *A Study of Probation Effectiveness*, 59 J. CRIM. L.C. & P.S. 361 (1968).

the group therapy program. If we solved all the matching problems and discovered lower recidivism rates for the group therapy treatment program, the effect could be due to the treatment per se, or it could very well be due to the fact that the courts did not randomly assign the juveniles; thus, a subject assigned to residential group therapy might be in exclusive contact with a group which was less "criminally inclined"—a factor independent of the treatment itself.[126]

Finally, an unavoidable statistical factor confounds ex post facto matching studies. In effect, these studies measure the differences between pre- and post-treatment tests for two groups. The pre-test is an index of scores on matching variables, such as degree of education or economic status, on the basis of which "equal" subjects will be selected, and the post-test is an index of scores of later success, such as being employed or avoiding arrest. In general, these two tests or indices are significantly correlated, but the correlation is less than perfect. One must therefore expect statistical regression towards the mean of the post-test (criterion) index, independent of any treatment effects, for *any* given sample of subjects. Also, as the two samples are drawn from different populations, one must expect that, as a statistical artifact, regression toward the means of the respective populations will produce apparent differences in the criterion index, independent of any real differences which may or may not exist due to treatments.

If there are really no treatment effects, one would still expect that in matching studies, as a result of statistical regression, the treatment program to which the more promising subjects are assigned would show a higher success rate when matched samples are compared. This is especially true when the two indices used are not very highly correlated (and in such criminological research they usually are not) and when the treatment populations from which the samples are drawn are quite different (they usually are). In summary, the problem of regression means that one could not plausibly conclude a positive effect of treatment from matched sample ex post facto criminological research.[127] Each of the other two problems mentioned above is equally as damaging. Unfortunately, therefore, it seems futile to look to these studies for any useful information on the effects of prison or other treatments.

By far the best, and perhaps the only remedy for these particular methodological problems is to assign subjects to treatments randomly. In an extensive research program, the California Youth Au-

126. H. EYSENCK, *supra* note 9.

127. A fuller explanation of these statistical problems can be found in the following references: Thorndike, *Regression Fallacies in the Matched Group Experiment*, 7 PSYCHOMETRIKA 85 (1942); D. CAMPBELL & J. STANLEY, *supra* note 124; Campbell & Clayton, *Avoiding Regression Effects in Panel Studies of Communication Impact*, 3 STUDIES IN PUB. COMMUNICATION 99 (1961).

thority has for some time randomly assigned subjects to treatment groups. Their data at this point indicate that 30 percent of the subjects in a community treatment program recidivate within 15 months, compared with 51 percent placed in a normal reformatory or released directly to parole.[128] These are certainly meaningful results which cast doubt on the relative effectiveness of prisons; they indicate that prison may be worse than useless in preventing future crime. However, the research itself suffers from three experimental faults. First, it would be most meaningful if the Youth Authority manipulated time spent in treatments over a wide range. Presently, time is somewhat confounded with treatment.[129] Second, the Youth Authority omitted a small percentage of eligible offenders who were unacceptable to the community from the study. We know nothing about treatment effects for them. Third, the Youth Authority has not used an adequate untreated control group. On occasion it has drawn the offenders released directly to parole from a different population, and at any rate parole does not constitute a "no treatment" condition. The results from a group which is immediately released after conviction with no further supervision or treatment of any kind, save that necessary to keep track of them, can tell us more precisely what the results from our other groups mean.

There are certainly practical, legal, and especially ethical barriers to such extended and rigorous use of randomized group designs in criminological research. However, one can also question whether it is ethical to continue to inflict punitive treatments when we have no knowledge that they help anyone and when we in fact suspect that in their present form they actually harm the offender and society. We should carefully consider the ethical problems involved in such fully randomized research before we reject it as undesirable.[130] Keeping in mind that the best research consists of randomized assignment of all possible types of offenders to all possible treatment conditions, several compromise solutions to the ethical problems are available.

First, researchers could use juveniles, as in the California Youth Authority program. Perhaps because until recently juveniles have had fewer legal rights than adults or simply because we have more concern for the young, we have used juveniles extensively in experimental-manipulative correctional research, whereas adults are seldom research subjects. Whatever the reasons, we do not seem to perceive ethical

128. CAL. YOUTH AUTHORITY, *The Status of Current Research in the California Youth Authority* (1968). The community treatment program is also less expensive than the reformatory.

129. Sometimes, for instance, offenders averaged less time in the community treatment program than in the reformatory, and time in any sort of treatment may be the actual determining factor.

130. Campbell, *Reforms as Experiments*, 24 AM. PSYCHOLOGIST 409 (1969).

problems in such research with juveniles. A tradition of rigorous research with juveniles does exist, and we could easily incorporate randomizing research of the type suggested here within this tradition.

Second, we might vary the time of treatment widely enough to achieve an approximation to an untreated control. Two months in a community treatment program with full release may be more effective than two years in a reformatory. If we find this to be true, we can limit the treatment time gradually to a month, a week, two days, until we have functionally assessed the effects of no treatment.

Third, we might use an "operant" method of assessment.[131] We could vary a treatment condition over time for a specified population and determine whether crime statistics vary directly and in a sustained fashion with our treatment manipulations.[132] This method has already been used in a limited way in assessing the effects of manipulations of severity of sentences, as for example when the sentence for rape was increased in Philadelphia,[133] or when the death penalty was eliminated in England for a five-year trial period. One can use it to assess *any* treatment effect. The method requires that researchers use a specified population, preferably in a specified locale, over a period of time when other conditions are relatively stable and manipulate the treatment condition to be tested up and down over its range at least several times. At some point it will be clear that the treatment has an effect or no effect. Since everyone receives the same treatment at any given time, this method seems to involve fewer ethical and legal problems.

Fourth, we could use a "quasi-experimental analysis"[134] to assess the effects of any social change. Such an analysis is essentially an operant method of assessment based upon careful and sophisticated analysis of alternative explanations of index changes following a single instance of social reform, rather than upon gross observations of the results of repeated manipulations of the reform. Repeated manipulations, of course, would enable quasi-experimental analyses to become even more powerful tools, or, contrarily, a quasi-experimental analysis could be fruitfully combined with an operant method of research.

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131. M. SIDMAN, TACTICS OF SCIENTIFIC RESEARCH (1960).

132. For example, I am quite certain that traffic tickets effectively deter students from parking in the campus faculty lot outside my window, even though the student lot is a mile from campus, because every semester during a two-day period in which parking stickers are sold and tickets are therefore suspended, the lot is filled with illegally parked student cars. Before and after the two day period, when tickets are assigned, the lot is devoid of student cars.

133. Schwartz, *The Effect in Philadelphia of Pennsylvania's Increased Penalties for Rape and Attempted Rape*, 59 J. CRIM. L.C. & P.S. 590 (1968).

134. Campbell, *supra* note 130; D. CAMPBELL & J. STANLEY, *supra* note 124.

Lempert[135] has discussed the application of such an analysis to legal impact, and Campbell and Ross[136] have provided one impressive example of how such an analysis can be used to assess the effects of alterations in speeding sentences. Criminologists have rarely used the quasi-experimental method, but it deserves the most careful attention.

CONCLUSION

This article has considered the implications laboratory studies of punishment might have for punitive treatments of criminals, has drawn parallels between laboratory operations and actual conditions of punishment of criminals, and has suggested reforms based on the experimental results. While generalizing from experimental studies in basic science to an applied field involves risks, the parallels and suggestions made here ought at least to point in proper directions. The suggestions about effective treatments generally have been made without regard for ethical considerations. Professionals in the criminological

135. Lempert, *Strategies of Research Design in the Legal Impact Study*, 1 L. & Soc'y Rev. 111 (1966).

136. Campbell & Ross, *The Connecticut Crackdown on Speeding*, 3 L. & Soc'y Rev. 33 (1968). In 1955 Governor Ribicoff of Connecticut, concerned about the high incidence of highway fatalities which he believed were due to speeding, increased the sentence for a speeding conviction from an haphazardly enforced loss of "points" to mandatory suspension of license for 30-90 days. Traffic fatalities declined over the next year. It is important to determine whether or not this decline was actually due to the institution of stiffer penalties. Since there was no unchanged, isolated "control group," exactly equivalent to the Connecticut population but not subject to the increase in penalty, we have no direct comparison on which to base a claim. The decrease in fatalities could have been due to any number of uncontrolled factors, such as safer cars being built in 1956, better weather in Connecticut that year, etc. A quasi-experimental analysis attempts to classify all possible alternative hypotheses in a dozen or so general categories, and uses sophisticated, detailed analysis to determine whether a given category could plausibly account for the effect in question. If none can, we can reasonably conclude that the manipulated factor—in this instance the speeding penalty—had the intended effect. For the case in question Campbell and Ross considered the hypotheses of better weather that year, better roads and cars, improved medical care for accident victims, publicizing of the 1955 death rate, a change in record-keeping procedures, chance variance in measurements, and statistical regression effects. Their chief mode of analysis is an "interrupted time series" design, in which indices of the various hypothesized factors above are plotted for several years before and after the sentencing increase and statistical analyses are applied. They use the same procedures in examining fatalities in neighboring states as an additional check on consistency of analysis. Campbell and Ross conclude that the harsher penalty was enforced to some extent, but that the increase in sentence severity led to a decrease in the willingness of the courts and police to enforce speeding penalties and in the willingness of the convicted offender to obey the sentence. Because of the possibility of statistical regression, they are unable to attribute the decline in fatalities to the increase in sentence severity. Although their analysis is quite comprehensive and detailed, it is meant only to be illustrative of a serious attempt at quasi-experimental analysis.

sciences are most competent to decide the final form of any concrete implementations of the suggested reforms, and both the professionals and the public must decide the ethical issues involved. In addition this Article has stressed the importance of assessing the effectiveness of our present, traditional criminal treatments or of any new, experimental treatments by rigorous field research.

Punishment is clearly an effective means of eliminating behavior; under ideal conditions manipulating severity can provide any desired degree of suppression. We must determine what concrete manipulations of severity are effective for criminal treatments of humans.

The results of laboratory studies of punishment suggest many possible legal and societal reforms that may reduce criminal behavior. First, as certainty and immediacy are among the most important ideal punishment conditions, by accelerating our legal processes we can increase the effectiveness of punishment. Second, considerations of secondary punishment and compensatory recovery suggest that we should provide offenders with reminders of punishment during the pretrial period and after prison, and that we might administer provisional or symbolic punishment immediately at the time and place of the crime. Third, based upon the experimental operation of extinction, the elimination of opportunities to commit or profit from crimes could markedly reduce criminal behavior. Fourth, as the effectiveness of punishment decreases as the control by the organism punished increases, the elimination of parole may be appropriate. Fifth, as the suppression of strongly established behavioral tendencies requires more severe punishment, sentence severity should be a function of the strength of criminal behavior, and we should punish recidivists increasingly more severely. Sixth, as the desire to escape from fears and anxieties may motivate the alcoholic and the drug addict and as incarceration may increase those very fears and anxieties, especially the physiological tensions associated with the addiction itself, punishment of alcoholics and drug addicts by incarceration might actually increase alcoholism and drug addiction. Seventh, the fact that most of the ill effects of punishment arise where the organism receives random and unavoidable punishment, without any possibility of escape or reward through alternative behavior, and the fact that the effectiveness of a given punishment is dramatically increased by the provision of an alternative route to reward, strongly indicate the importance of combining rehabilitation with punishment. Eighth, response cost results and some field evidence suggest that we "make the punishment fit the crime." Ninth, success with clinical aversion therapy indicates that its extension to the treatment of many criminal offenses would be appropriate. Tenth, theories of punishment suggest that punishments should occur in an everyday environment, in and by the community.

Punishment is a burgeoning scientific field. In five or ten years researchers will have fleshed out the experimental results and will have made important theoretical advances. Hopefully, the criminological disciplines will pay careful attention to these contributions. However, they should not limit their inquiries to the field of punishment. They should also consider in detail other pertinent topics from the human biological sciences: Genetics. Is criminal behavior inheritable, and if so, how? What are the criminological implications of Klinefelter's syndrome?[137] Experimental Psychology. How do crowded living quarters affect organisms and how does this bear on the crime problems in our cities? How do the basic mechanisms of conscience, guilt, and remorse operate? What are the developmental causes of abnormal or criminal behavior in animals? How can aggression be learned? Ethology. What mechanisms do animals have to prevent intra-species violence? What do we know about animal aggression? How is human aggression similar or potentially so? Physiology. What parts of the brain control violence and aggression? How can this knowledge help us? What chemicals can suppress anger and violence? How can we best use them? The potential is vast.

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137. This refers to the possible linkage between chromosomal abnormalities and criminal predilections. *See,* e.g., Montagu, *Chromosomes and Crime,* 2 PSYCHOLOGY TODAY 42 (1968); Telfer *et al., Incidence of Gross Chromosomal Errors Among Tall Criminal American Males,* 159 SCIENCE 1249 (1968).

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