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AMERICAN STUDIES IN THE PREDICTION OF RECIDIVISM

Elio D. Monachesi

The following article is one of several reports on American research in Criminology that have been prepared for presentation before the World Congress of Criminology at its sessions in Paris, September 10 to 18, 1950.

The author is Professor of Sociology in the University of Minnesota. His latest contribution to this JOURNAL was published in our last number under the title, "Personality Characteristics of Institutionalized and Non-institutionalized Delinquents."—EDITOR.

Any penological system that permits the utilization of varied techniques for treating criminal offenders compels officials or groups of officials, entrusted with the task of administering criminal justice, to make decisions of far reaching import. These officials, and/or regularly constituted boards, commissions, judges, probation and parole officers, psychiatrists, social workers, etc., must decide which amongst a variety of available treatment techniques is the one most apt to achieve the objectives of a specific punitive and/or correctional organization. When the law permits the use of discretion, it is they who must decide whether an offender will be granted probation, sent to a reformatory or to a penitentiary, when he should be paroled or conditionally released; in short, they must make the decisions that will ultimately determine how well the objectives of the administration of criminal justice are achieved.

It is generally agreed that amongst the objectives of a punitive or correctional system is the prevention of the re-occurrence of criminal behavior on the part of those who have deviated from the socially accepted and legally prescribed rules of conduct. The aim of many programs of treatment of criminal offenders is the prevention of recidivism, and the choice of any treatment plan is consciously or unconsciously predicated upon the belief that on the basis of what is known about the characteristics of an offender a particular technique of treatment will best achieve the objectives of the correctional system. Offenders are placed on probation, incarcerated, released on parole, etc., when the accumulated evidence suggests that they possess that pattern of attributes which tends to insure the favorable response of offenders to such plans of treatment. The degree to which choices are accurately made determines not only the effectiveness of any treatment program in achieving the desired results, but also the manner in which the community is safeguarded against predatory individuals. The procedures involved in making such decisions, the kind of information utilized in arriving at decisions are of the utmost importance in the administration of criminal justice.

The extent to which the choices made are based on sound procedures and accurate information determines the extent to which the objectives of correctional and rehabilitative programs will be achieved. If it is agreed that the proper choice amongst several alternative methods of treatment bears a significant relation to the outcome of treatment, then it would seem that any serious attempt which is made to relate the pattern of an offender's characteristics to his most probable response to the available methods of treatment would materially aid in the achievement of the desired effects of treatment. Several American social scientists have been preoccupied for the last three decades with investigations designed to reveal those factors in the emotional, psychological, and social background of delinquents and criminals that facilitate or impede their favorable response to specific treatment plans. In general, the work of these scientists constitutes attempts to discover ways to prevent recidivism by suggesting, on the basis of empirical evidence, treatment methods necessary in order to effect desirable modifications in the personality structure of offenders.

It is our intent to review the work of some of these social scientists. We shall 1) summarize studies which represent contrasting techniques employed to predict outcome of treatment; 2) suggest how closely predicted behavior coincides with actual behavior; and 3) outline the more fundamental problems that remain unsolved in this field of research.

RATIONALE UNDERLYING PREDICTION OF RECIDIVISM

Despite the fact that several contrasting methods have been employed to predict the likelihood of recidivism, the work of all scientists engaged in research on this problem is founded on a similar rationale. In all investigations it is assumed that delinquents and criminals, as well as other human beings, can be made the objects of scientific study and that the resultant data can be ordered into stable classification categories of the emotional, psychological, and social characteristics of the persons studied. It is further assumed that individuals who possess a pattern of such characteristics, more or less in common, will tend to react with a significant degree of similarity to like situations. In other words, given a specific pattern of personal characteristics, it is assumed that the behavior of persons who possess the designated pattern will vary within known limits. Obviously, if it can be demonstrated that these assumptions square with empirical reality, the very practical problems encountered in making a proper disposition of offenders, in order

to minimize the likelihood of recidivism, will be so much nearer to solution. The empirical substantiation of the assumptions made in studies of the prediction of recidivism would, it is believed, result in the delineation of the limits within which both error and chance would function in the determination of the disposition of offenders. But even more than aiding in the solution of practical problems encountered in the day by day administration of criminal justice, systematic and careful studies of the predictability of certain selected phases of human behavior would probably produce results compatible with one of the major objectives of scientific endeavor. Despite the labels attached to the word, science, it is generally agreed that one of the major goals of scientific work is to produce accurate descriptions of the relations found to exist between certain effects and a sequence of antecedent events. Such relationships are generally summarized in formulae of the probability of the occurrence of a designated effect when certain conditions are known to exist. In short, one of the goals of science is prediction. Studies that attempt to so describe the relation between the personality structure of categories of delinquents and criminals and the response of such offenders to different methods designed to treat them so as to render them non-deviant in the future, represent efforts to achieve reliable predictions of human conduct in one area of human social life.

One of the earliest attempts made to determine the degree to which recidivism is related to certain background characteristics of criminal offenders was reported by S. B. Warner in 1923.¹ The official records of 680 men were examined. Three hundred of these men had been successful on parole, 300 had responded unfavorably to parole, and 80 of them had not been paroled. Warner then collected information on approximately 60 items contained in the pre-parole records of the offenders and attempted to find which of the items differentiated between offenders who succeeded or failed on parole. His analysis led him to conclude that the items studied, with the exception of a pre-parole criminal record and the Alienist's report, did not discriminate in any significant fashion between parole violators and non-violators. He, therefore, concluded that the type of information collected on the pre-parole history of inmates of the Reformatory was of little or no value upon which to base a decision regarding the parolability of inmates.

Warner's conclusions were regarded as inappropriate by Hornell Hart, who in an article which appeared in November, 1923,² indicated

1. WARNER, S. B., *Factors Determining Parole from the Massachusetts Reformatory*, 14 *JOUR. CRIM. LAW & CRIMINOL.*, 172-207 (1923).

2. HART, HORNELL, *Predicting Parole Success*, 14 *JOUR. CRIM. LAW & CRIMINOL.*, 405-413 (1923).

that, had Warner utilized a measure of the statistical significance of the difference in percentages of parole violators and non-violators classified in several of the item categories employed in his study, he would have arrived at entirely different conclusions. Hart also suggested that, even though certain items of information regarding the pre-parole life of an offender may bear a low though positive relation to conduct on parole, it does not necessarily mean that such items are worthless in the prediction of outcome of parole. It may be true that any one such single item may prove inefficient to assess the parolability of offenders, yet the summation, in some fashion, of the total effects of such items, Hart believed, could be employed to formulate the probabilities of parole violation or non-violation for every offender. In other words, Hart was convinced that, though some pre-parole items of information may be found to be only slightly related to conduct on parole, a summary of the relations of such items with behavior on parole could be utilized to predict outcome of parole.

THE BURGESS METHOD OF PREDICTING RECIDIVISM

Hart's suggestions found implementation in the work of E. W. Burgess, reported in 1928, and in the work of Sheldon and Eleanor T. Glueck, reported in 1930.³ The Burgess study represents an effort to discover factors in the pre-parole life of offenders that may be employed as predictors of response to parole. Burgess studied the official files of 3,000 paroled offenders from the Illinois State Reformatory (Pontiac), the Southern Illinois Penitentiary (Menard), and the Illinois State Penitentiary (Joliet). Each of these institutions contributed 1,000 cases to the investigation. The information found in the records relating to the pre-parole life of offenders was classified in appropriate categories. These data, when so classified, revealed that the parole conduct of offenders varied in accordance with certain patterns of the pre-parole background of offenders. Parole violation and non-violation was found to be related in some way to the patterns of factors which differentiated those who succeeded from those who failed on parole.

In order to ascertain the relationship that each pre-parole factor in the life of inmates bore to conduct on parole, Burgess compared the parole violation rate for each of the sub-categories of information de-

3. BRUCE, A. A., HARNO, A. J. BURGESS, E. W., AND LANDESCO, J. PAROLE AND THE INDETERMINATE SENTENCE, Springfield, Illinois: ILLINOIS STATE BOARD OF PAROLE, 1928. GLUECK, SHELDON AND ELEANOR T., 500 CRIMINAL CAREERS, New York, Alfred A. Knopf, 1930. A report of the Glueck method for predicting selected aspects of criminal behavior appeared in 42 HARV. L. REV., 300-329, January, 1929, under the title, *Predictability in the Administration of Criminal Justice*. The discussion presented in this article is incorporated in the materials of Chapter 18, in 500 CRIMINAL CAREERS.

scribing the offender with the parole violation rate of each of the institutions from which the offender had been paroled. As will be readily understood, this method for measuring the degree to which each category violation rate deviated from the average violation rate rendered possible the discovery of those factors in the pre-parole background of paroled men which seemed to be associated with success or failure on parole. The data presented in Table I should serve to illustrate the method employed in the analyses. These data suggest the degree to which an offender's pre-incarceration work record is related to conduct on parole. As will be noted, the parole violation for the 1,000 men paroled from the penitentiary at Joliet is 28.4 per cent; however, offenders who had no pre-incarceration work record violated parole to the extent of 44.4 per cent. Men paroled with a record of regular work failed in only 12.2 per cent of the cases. These data in general show that success or failure on parole bears a relationship to an offender's pre-incarceration work history. Failure on parole is associated with a poor work history, while a reasonably good work history seems related to success on parole. Each of the pre-parole factors studied were analyzed in this fashion, and the analyses permitted Burgess to identify those factors in the background of offenders which seemed to suggest the probabilities of success or failure on parole for various groups of offenders.

TABLE I⁴
Parole Violation and Pre-Parole Work Records

Pre-Parole Work Record	Parole Violation Rate by Institution		
	Pontiac	Menard	Joliet
All offenders	22.1%	26.5%	28.4%
No previous work record.....	28.0%	25.0%	44.4%
Record of casual work.....	27.5%	31.4%	30.3%
Record of irregular work.....	15.8%	21.3%	24.3%
Record of regular work.....	8.8%	5.2%	12.2%

The utilization of those factors discovered to be predictors of parole success or failure required that some method be developed which permitted the summation of the way each particular pre-parole factor was related to conduct on parole. Burgess solved this problem by assigning an arbitrary weight of one point to each of the pre-parole factors identified with a violation rate less than the average parole violation rate for all offenders. Thus, offenders with a record of regular work paroled from the three institutions studied (See Table I) received one point, while

4. BRUCE, A. A., HARNO, A. J., BURGESS, E. W., LANDESCO, J., *op. cit.*, p. 229, Table XVIII.

all offenders classified as having a record of casual work received zero on this pre-parole factor. Each of the pre-parole factors utilized as predictors of outcome of parole were treated in this manner, and thus a prediction score for each of the offenders included in the investigation was obtained. The individual offender's prediction score with its appropriate violation rate furnished the data which were employed in the construction of an expectancy table of parole violation.

The Burgess prediction table of parole outcome is based upon scores made by offenders on twenty-one pre-parole factors. These factors or classificatory categories, based upon the official record of the men studied, involved such items as work history, marital status, social type, national and ethnic origin, criminal record, habits, etc. The manner in which the scores made on the twenty-one pre-parole factors employed to predict outcome of parole is illustrated in Table II. Of all offenders who received a score of from 2 to 4 points on pre-parole items 76.0 per cent failed on parole, while only 1.5 per cent of all offenders who fell between the score interval of 16-21 points failed on parole. On the basis of the data summarized in Table II, it becomes possible to suggest that, if we may assume that in the future the conditions under which men were paroled from the Joliet institution remain the same, offenders with a score of 15 points will most probably fail on parole 2.2 instances in 100. On the other hand, the odds that offenders with scores of 2 to 4 points will fail on parole are 76 in 100.

TABLE II⁵
Expectancy Rates of Parole Violation and Non-Violation
(Joliet Group)

Points for number of favorable factors	Number of Men in Each Group	Expectancy Rate for Success or Failure			
		Per cent Violators of Parole			Per cent Non-violators of Parole
		Minor	Major	Total	
16-21	68	1.5	0.0	1.5	98.5
14-15	140	0.7	1.5	2.2	97.8
13	91	5.5	3.3	8.8	91.2
12	106	7.0	8.1	15.1	84.9
11	110	13.6	9.1	22.7	77.3
10	88	19.3	14.8	34.1	65.9
7-9	287	15.0	28.9	43.9	56.1
5-6	85	23.4	43.7	67.1	32.9
2-4	25	12.0	64.0	76.0	24.0

5. BRUCE, A. A., HARNO, A. J., BURGESS, E. W., LANDESCO, J., *op. cit.*, p. 248, Table XXVII.

The Burgess method for constructing expectancy table of outcome of parole is quite straight forward and simple. It requires no great amount of labor. Its simplicity, however, tends to raise a number of important questions. In the first place, Burgess assigned equal weights to all pre-parole factors discovered to facilitate success on parole, regardless of the degree to which any single factor was related to non-violation of parole. In the second place, many of the factors used as predictors of conduct on parole were simply a manifestation of the same basic or underlying emotional, psychological, or social characteristic of the offender. Thus, such categories of information as "work history," "social type," "intelligence," may well be intercorrelated and should probably be regarded as different measures of one basic dimension of the life of an offender.

THE GLUECK METHOD FOR PREDICTING RECIDIVISM

In the work of the Gluecks is found answers to some of the questions raised by the work of Burgess. The method developed by the Gluecks for predicting recidivism permits the weighting of factors on the basis of the degree to which factors are related to conduct which is predicted, and utilizes only those factors found to be significantly related to predicted behavior. The Gluecks, rather than relying upon the simple comparison of the average failure rate and the failure rate of each of the sub-categories of information on characteristics of offenders, utilize the coefficient of mean square contingency to discover the degree to which each factor in the offender's background is associated with designated behavior. The utilization of this statistical device permits the Gluecks to employ as predictors only those factors which bear a close relationship to predicted conduct. The weighting of the factors that enter into the scores upon which probability tables are based is rendered possible by adding the percentage values of the failure rates found for each sub-category of information describing specific classes of offenders. Thus, an offender's score consists of the failure percentages of the sub-categories which describe these characteristics in his background selected as predictors of conduct. The manner in which these scores are employed in determining the probabilities of recidivism is illustrated by the data presented in Table III. Therein are found the predictions of post-parole recidivism for a group of young men released from the Massachusetts Reformatory during the years 1921 and 1922. The prediction scores are based upon the following six pre-reformatory and one reformatory factor found to be most closely related to post-parole conduct; indus-

trial habits, frequency and seriousness of pre-Reformatory crime, arrest for crimes preceding the offense for which the offender was committed to the Reformatory, penal experience preceding incarceration in the Reformatory, pre-Reformatory economic responsibility, mental abnormality on entrance to the Reformatory, and the frequency of offenses in the Reformatory.⁶ The Gluecks indicate that the data in Table III could be of great aid to parole boards since it could be used not only in the determination of which offenders should be released on parole, but also in planning the kind and amount of supervision an offender may require on parole. This table may also be used to determine the most probable post-parole conduct of an offender.

TABLE III'

Probable Post-Parole Criminality Rates Based on Total-Failure Scores On Six Highest Pre-Reformatory Factors and Highest Reformatory Factor

Total-Failure Scores	Probable Status as to Post-Parole Criminality (Percentages)			
	Success	Partial Failure	Total Failure	Total
274-325	71.5	21.4	7.1	100
326-425	40.6	18.8	40.6	100
426-475	11.6	15.2	73.2	100
476 and over.....	4.7	12.5	82.8	100
Total	20.9	15.8	63.3	100

Within two years after the publication of the work of the Gluecks appeared three other studies which further demonstrated the feasibility of utilizing selected items of information in an offender's background as predictors of criminal conduct. George B. Vold⁸ and Clark Tibbitts⁹ confined their attention to the prediction of conduct on parole, while Elio D. Monachesi,¹⁰ focused upon the prediction of conduct on probation. In the Vold and Monachesi studies both the Burgess and the Glueck methods were employed to construct expectancy tables of parole and probation conduct, and both investigators report that the methods

6. GLUECK, S., AND GLUECK, E. T., *op. cit.*, pp. 281-283.

7. GLUECK, S., AND GLUECK, E. T., *op. cit.*, p. 286. Table 113.

8. VOLD, GEO. B., *PREDICTION METHODS AND PAROLE*. Hanover, New Hampshire: The Sociological Press 1931.

9. TIBBITTS, CLARK, *Success or Failure on Parole Can Be Predicted*. 22 JOUR. OF CRIM. L. & CRIMINOL., 11-50. May, 1931.

10. MONACHESI, ELIO D., *PREDICTION FACTORS IN PROBATION*. Hanover, New Hampshire: The Sociological Press, 1932.

tended to produce score distributions which were quite similar. The Burgess method was used for the Tibbitts study.

The publication of studies in the prediction of selected phases of criminal behavior between 1928 and 1932, demonstrated that experiences with specific categories of offenders could be systematized and utilized to determine the probabilities of conduct of offenders subjected to designated treatment programs. The results of these initial studies suggested that decisions regarding such important phases of the correctional process as probation and parole could be based upon empirical data that pointed to the likelihood of an offender's successful response to probation and parole. The work of the Gluecks went even further in that their results indicated that it was possible to utilize certain of the personal and social characteristics of offenders to predict recidivism during a five year post-reformatory and/or parole period. In the years that followed the publication of the first studies in this field of research, not only have new methods for predicting recidivism been developed, but attempts have also been made to utilize prediction methods in other phases of criminal behavior. Thus, in 1935, Vold published the results of a study which involved an attempt to apply prediction methods to the problem of selecting for different types of offenders various types of treatment available in institutions. In other words, Vold was interested in finding out if it were possible to predict what type of treatment offered by an institution would best serve the purpose in specific categories of offenders. His study was confined to offenders in the Massachusetts State Prison at Charleston and the Massachusetts State Prison Colony at Norfolk. A total of 579 male offenders were included in the study, of which 290 were supplied by the State Prison. All responsible officers having contact with the Colony group of inmates were asked to rate inmates in one of the three following classifications:

- “(1) As among the best one-fourth at the institution, that is, cooperative and seriously interested in taking advantage of the facilities offered by the institution for his own development;
- (2) As among the worst one-fourth, that is, a continual trouble maker, disagreeable and generally non-cooperative;
- (3) As belonging to the middle half, neither a conspicuously good prisoner nor a conspicuously bad one.”¹¹

In the case of the State Prison group, Vold adopted an already existing scheme of classification. In this institution various officers in charge

11. VOLD, GEO. B., *Prediction Methods Applied to Problems of Classification Within Institutions*, 25 JOUR. CRIM. L. & CRIMINOL., 202-209, July, 1935, p. 207.

of inmates had been required to make monthly reports on prisoners in their charge. Prisoners were graded A, B, C, or D on various items indicative of their response to institutional life and activities. Numerical values were attached to these letter grades and then averaged into a score. Vold then examined a number of pre-incarceration factors in the lives of the inmates and each inmate was scored. The prediction tables constructed tended to indicate that knowledge of certain factors in the pre-prison life of an offender could be used to predict his probable response to institutional life. Vold's prediction table is based on twenty-nine factors and constructed by the Burgess method of scoring although he experimented with the Glueck scoring method. These two methods gave quite similar results in this case, just as they have produced similar results when applied elsewhere. In addition, Vold tells us that he tried using ten factors which on inspection were judged as important in determining prison conduct. The table based upon these ten selected factors did not differ materially from the one based on twenty-nine factors, though the latter method tended to discriminate more sharply at the ends of the score frequency distribution.

Vold's work is of importance in that it applies the prediction idea to another field of human behavior. The extensive use of this prognostic instrument in this field has a number of far-reaching implications. There is some agreement among students that penal institutions do not always offer enough in the way of individualized treatment to their inmates. Even when serious attempts are made in this direction little is available which has been tested and evaluated to any considerable extent. The utilization of prediction tables would tend to make necessary the testing of programs in terms of results achieved and would probably result in the launching of novel methods of treatment.

OTHER TECHNIQUES FOR PREDICTING RECIDIVISM

Another type of prediction instrument, named a criminal-liability index, and designed to determine the probabilities of reformation and non-rearrest of first offenders was developed by Walter W. Argow.¹² The data employed to develop the index were produced by an examination of the case histories of 563 offenders confined in the jails in Connecticut. The social and personal data contained in the case histories were classified under thirty-one categories and the procedure employed in producing the index involved the following steps: 1) The calculation of the percentage of recidivists and first offenders in each classifica-

12. ARGOW, WALTER W., *A Criminal-Liability Index for Predicting Possibility of Rehabilitation*, 26 *JOUR. CRIM. L. & CRIMINOL.*, 561-577, Nov., 1935.

tory category; 2) The calculation of the ratio of recidivists and first offenders in each category (percentage of recidivist served as the base); 3) The utilization of a ten point scale to assign values to the ratios. All factors assigned a value of less than ten were deemed conducive to recidivism, whereas those factor ratios assigned a value of more than ten were designated as favorable to non-rearrest; 4) The calculation of scores for offenders based on the values assigned to factor ratios as determined by the preceding step. An offender's final score consisted of an average of the values assigned to each of the classificatory categories; 5) The calculation of the mean scores for first offenders, recidivists and the entire group of cases studied. The offender's score was divided by the mean score of the group and the quotient was regarded as the criminal-liability index for the offender. The index thus produced is looked upon as determinative of an individual's rehabilitative possibilities based upon a summary of the manner certain specific personal and social characteristics were found to differentiate between recidivists and first offenders. Argow's index represents a novel way of utilizing certain life background factors for the prediction of criminal behavior and applies predictive methods to another phase of the correctional process.

The next variation in techniques for predicting recidivism is found in the work of Ferris F. Laune.¹³ The utilization of what Laune describes as static data categories as predictors of outcome of parole places serious limitations upon the efficiency of prediction instruments. The offender's adjustment to life beyond prison walls, he believes, is dependent upon his attitudes, and these are probably affected by prison experiences. It is, therefore, necessary to take into account an offender's attitude when decisions regarding his parolability are made. The problem involves finding some method for ascertaining the status of an offender's attitudes periodically so as to make reasonably certain when an offender is ready for parole. A satisfactory method to be used in this connection consists in making use of the "hunches" of persons who are intimately acquainted with the offender. Laune believes that fellow-inmates acquainted with the offender would probably be especially qualified to render estimates of the offender's probable parolability. "If these estimates or 'hunches' are valid, it follows that an analysis of the prisoner by an official, proceeding on the same basis as that which prompts the inmate's prediction, would place the authorities in possession of an excel-

13. LAUNE, FERRIS F., *PREDICTING CRIMINALITY*. Chicago: Northwestern University Studies in Social Sciences, No. 1, 1936.

lent instrument for prediction."¹⁴ Having made these assumptions, Laune first addressed himself to the task of finding out if such valid inmates' estimates exist. To do so, he asked two qualified inmates of Joliet to rate independently one hundred and fifty fellow inmates as to their parolability. The predictions of inmates X and Y were correlated and an r of $+.6236$ resulted. The next step was to find the factors at the basis of such "hunches." "The method employed for the isolation and identification of the unit characters underlying 'hunches' may be termed the 'discussion method.'"¹⁵ Each inmate investigator discussed with the other the reasons for assigning certain ratings to each of the one hundred and fifty inmates whom they had been asked to rate. These discussions resulted in the apparent isolation of forty-two unit factors upon which hunches were based. The list contains such items as: excessive interest in clothes; stupidity; timidity; industry; sex-craving; lack of love for relatives; emotional stability; selfishness; love of comfort; wanderlust; etc. Inspection of the forty-two basic factors led to a modification in the list so that the final list was enlarged to contain fifty-four factors. The scores of inmates in this final list, when correlated with the original ratings, resulted in coefficients varying from $+.55$ to $+.83$. Further, Laune found intercorrelations between factor scorings of different investigators to range from $+.68$ to $+.78$.

The next problem confronted was that of determining the presence or absence of vital factors in specific individual cases without the aid of the inmate "hunches." In other words, Laune next attempts to construct an instrument for detecting basic factors related to the parolability of offenders. The problem was solved by constructing a questionnaire containing 1701 questions. This long questionnaire was first tried on a "Truth Group" (57 inmates who after being told the purpose of the project consented to answer each question truthfully) so as to arrive at knowledge of the relative significance of each question in the test. Further tests of the value and significance of questions were made by administering the questionnaire to another group of inmates. This latter group consisted of men who were not pledged to truthfulness. After other series of groups were tested, the questionnaire was reduced to 159 questions. The questions chosen "yield information most closely analogous to that supplied by 'hunch' judgments."¹⁶ Scores obtained from questionnaires when correlated with inmates' "hunches" yielded an r of $+.68$ and when correlated with scores derived by the Burgess method an r of $+.62$ was obtained.

14. LAUNE, FERRIS F., *op. cit.*, p. 9.

15. LAUNE, FERRIS F., *op. cit.*, p. 19.

16. LAUNE, FERRIS F., *op. cit.*, p. 61.

The questionnaire of 159 questions was further tested by administering it to fifty-seven inmates who were not guaranteed that their responses would be treated confidentially. This was done in order to determine the degree to which correlations would carry over from the "Truth Group" to other groups of inmates. The scores of this additional test group were correlated with "hunch" scores and a coefficient of $+0.385$ was obtained. Laune then deleted from the questionnaire factors which were found to be of little significance. The significance of an item was determined on the basis of a correlation coefficient of "hunch" scores and questionnaire scores. This selective process produced a questionnaire based upon thirty-six factors rather than upon the original fifty-four. It is this final questionnaire which indicates the existence of basic factors related to an offender's parolability that is designated as the basis of an expectancy table.

Between the years 1937 and 1943, the Gluecks extended prediction techniques to several other phases of the punitive-correctional process. With the publication of three monographs¹⁷ the Gluecks make available prediction devices which may be employed to predict the probability of recidivism for offenders over a considerable span of years, in accordance with the kind of correctional treatment to which they have been subjected. The work of the Gluecks, if employed in practice, would enable judges and others with whom rest the decisions regarding the dispositions of cases to choose and devise that treatment plan which, on the basis of systematic experiences, would most probably bring about the desired modifications in the conduct of an offender. Further, the utilization of prediction techniques in all phases of the correctional process, wherein some discretion as to what may be done with an offender is permitted by law, would tend to assure that an offender would be accorded that treatment which his personal and social characteristics indicate as most effective in bringing about desired changes in his conduct.

In another study published in 1943, the possibilities of extending prediction methods to another important field are explored. H. Ashley Weeks¹⁸ reported the results of his investigation designed to predict juvenile delinquency, as well as the type of offenses juveniles are likely to commit. He sought to determine the way a group of 420 delinquent males and 421 non-delinquent males differed in social characteristics.

17. GLUECK, S., AND GLUECK, E. T., *LATER CRIMINAL CAREERS*, New York: The Commonwealth Fund, 1937. *JUVENILE DELINQUENTS GROWN UP*, New York: The Commonwealth Fund, 1940. *CRIMINAL CAREERS IN RETROSPECT*, New York: The Commonwealth Fund, 1943.

18. WEEKS, H. A., *Predicting Juvenile Delinquency*, 3 *AMER. SOCIOL. REV.*, 40-46, Feb., 1943.

The comparison yielded results which indicated that the two groups were significantly different on fourteen social background categories. These differences, he suggests, may be utilized as predictors of delinquency and he outlines the methods which may be employed to summarize the relation of these predictors to delinquent behavior. One of the methods used by Weeks is essentially the same one developed by Burgess and it consists of giving a weight of one point for each factor in the background of the offender found to differentiate delinquents and non-delinquents. The other method developed by Weeks represents an attempt to weight the factors in accordance with the way each of them differentiates between the two groups. The weighting was accomplished by assigning to each factor the value of the critical ratio calculated to indicate the level of significance ascribed to the differences in the characteristics of delinquents and non-delinquents. The scores thus derived are weighted scores in accordance with the way the predictors differentiate between delinquents and non-delinquents.

In addition to demonstrating that delinquent behavior may be predicted, Weeks also presents data that suggest that different patterns of social background characteristics are associated with different types of delinquencies. These varying patterns of background factors, Weeks believes, may be utilized as predictors of specific types of delinquency.

The several investigations discussed should suffice to show how and to what phases of the correctional process American social scientists have applied prediction methods. The studies cited, amongst others that have been reported in the literature, demonstrate the feasibility of employing data on the personal and social characteristics of offenders to predict the likelihood of recidivism. Expectancy tables of the probabilities of criminal and delinquent conduct have been construed in the various ways discussed. Whether these probability tables of recidivism will be used in the day-by-day work of officials on whom falls the responsibility for making decisions regarding the disposition of offenders must, to a considerable extent depend upon the demonstrated accuracy of such prediction tables.

EFFICIENCY OF PREDICTION INSTRUMENTS

In contrast to the relatively numerous investigations focused upon the construction of expectancy tables of recidivism, only a handful of studies designed to test the accuracy of available prediction tables have been made. The paucity of data for the empirical verification of predictions based upon the relational patterns of personal and social factors of

offenders and conduct has tended to impede the application of prediction techniques to the practical and everyday work of judicial and correctional authorities. Further, the conflicting and, at times, discouraging results produced by studies of the correspondence of what is predicted with what actually occurs has tended to demonstrate that we are still far from achieving the objectives of the studies made in this field.

The first attempt to test the effectiveness of prediction devices was made by George B. Vold, who compared actual parole behavior with predicted parole behavior of 282 men paroled from the Minnesota State Prison between July 1, 1927 and July 1, 1929.¹⁹ The parole predictions made were based upon an expectancy table constructed by the Burgess method for a group of 542 cases paroled from the Minnesota State Prison during 1922-1927. The percentage of men who violated parole in this earlier group was 24.7, and if the follow-up group violated parole to the same extent, then 70 men would be expected to violate parole. It was found, however, that the prediction table indicated failure for only 57 men, involving an error of 13 cases, and representing a discrepancy of 4.6 per cent. The actual violation rate for the 282 men in the follow-up groups was 22.3 per cent as against 24.7 per cent for the first group. The change in actual violation rates for the two groups reduces the error between the number of cases expected to violate and the number of cases that actually violated to 6 (57 as against 63) and constituting, therefore, an error of 2.1 per cent. In light of these data, Vold suggests "That the principal error that appears is due to the changed rate of parole violation for the institution. Parole prediction seems to have worked within the limits of about a two per cent error."²⁰

The report of the next effort to test the validity of parole predictions appeared in 1935. The test was made by Barkev S. Sanders by utilizing two samples of men who were paroled or conditionally released from penal institutions of the United States.²¹ One group studied by Sanders consisted of 5,912 offenders released between July 1, 1933, and June 30, 1934, and the other group containing 2,838 men released between July 1, 1934, and December 30, 1934. The predictions of outcome of parole for offenders were based on an expectancy table developed by the utilization of the Burgess method. The comparison of actual with predicted parole violations for the first group (5,912 cases) demonstrated that the two series of data were closely related, and it seems apparent that

19. VOLD, GEORGE B., *Do Parole Prediction Tables Work in Practice?* 25 PUBLICATIONS OF THE AMER. SOCIOLOGICAL SOC., 136-138, 1931.

20. VOLD, GEORGE B., *op. cit.*, p. 138.

21. SANDERS, BARKEV S. *Testing Parole Prediction*, PROCEEDINGS OF THE SIXTY-FIFTH ANNUAL CONGRESS OF THE AMERICAN PRISON ASSOCIATION, 1935. Pp. 222-233.

the predictors of outcome of parole or conditional release were significantly associated with actual behavior. The results for the other group were, however, disappointing. The comparison of predicted and actual behavior for this group showed some relations between predictors and behavior, yet tests of the significance of these relationships indicated that chance might well have produced them.

World War II provided a rare opportunity for testing empirically the predictive efficiency of the Glueck method for the construction of expectancy tables.²² One of the prediction tables found in the Gluecks' *Criminal Careers in Retrospect*,²³ provides data that may be employed to predict the behavior of former juvenile and adult offenders in the armed forces during war time.²⁴ The data utilized to test the validity of this expectancy table were collected for 200 soldiers confined in an army rehabilitation center because they had committed various military offenses. All of these 200 men had formerly been civilian delinquents. The Glueck prognostic table intended for the prediction of behavior of civilian offenders in the armed forces employs five predictors. Information on these five factors was collected for each of the 200 soldiers and sent to the Gluecks²⁵ who then scored each case. The five predictive factors were: (1) education of the offender's parents; (2) intelligence of the offender; (3) the age of the offender at the time when he manifested signs of embarking on a criminal career; (4) the age of the offender at the time he began to work; (5) the industrial skill of the offender.

The scores attained by the 200 soldiers on these five predictors of conduct of former civilian delinquents in the armed forces indicated that it would have been possible to predict accurately misconduct for approximately 85 per cent of the cases. Of interest too is the fact that the predictions of maladjustment made on the basis of the Glueck's prognostic table coincide to a remarkable degree with the prognoses made by psychiatrists as to the offender's probable adjustment to army life after treatment in the rehabilitation center. The degree to which these two series of predictors corresponded becomes even more astounding when it is learned that the prognoses made by psychiatrists were based upon comprehensive psychiatric case histories that included information on the offender from many sources. The data reported in this study would

22. SCHNEIDER, ALEXANDER J. N., LA GRONE, CYRUS W., JR., GLUECK, ELEANOR T., AND GLUECK, SHELDON, *Prediction of Behavior of Civilian Delinquents in the Armed Forces*, 28 MENT. HYG., 456-475, July, 1944.

23. New York: The Commonwealth Fund, 1943.

24. GLUECK, S., AND GLUECK, E. T., *op. cit.*, Table 50, p. 277.

25. At the time the study was made, *CRIMINAL CAREERS IN RETROSPECT* had not been published.

seem, therefore, to indicate that the Glueck table to predict conduct of civilian offenders in the armed forces is significantly effective in producing accurate forecasts of behavior. Such a predictive device as the one developed by the Gluecks would have immense practical value to officials whose task it is to ascertain at the point of induction into the armed forces a person's most probable adjustment to army life.

A follow-up study of probation prediction was reported by Monachesi in 1945.²⁶ He employed an expectancy table (the Burgess method was used to construct it) based on outcome of probation for a group of 896 juvenile delinquents granted probation during 1923-1925 by the Ramsey County, Minnesota, District Court. The follow-up sample included 120 cases of juveniles placed on probation during the period 1939-1940. The comparison of predicted and actual outcome of probation indicated that the predictors employed permitted accurate predictions for individuals who fell at the extreme ends of the score distribution. The predictions made for persons falling toward the middle of the score distribution deviated from actual outcome of probation by wide and disturbing margins. Thus the expected violation rate for offenders who scored 32 to 35 points was 26.7 per cent, the actual violation rate was 34.7 per cent. The expected violation rate for persons with 36 to 39 points was 17.6 per cent as against an actual rate of 29.0 per cent. While it is impossible to draw any significant conclusion regarding the validity of an expectancy table of outcome of probation from data that are derived from 120 cases, the differences found between predicted and actual behavior for offenders who fall within middle score categories tend to make suspect the efficiency of the predictors employed in the construction of Monachesi's prognostic instrument.

In 1948 appeared another study of the validity of prediction of parole. Hakeem compared predicted and actual parole behavior of 1,108 men from one of the branches of a state prison system during 1939 and 1940.²⁷ The Burgess method was used to score offenders upon which was based the likelihood of violation and non-violation of parole for each offender, and the table used to assign probabilities of parole outcome was founded upon the analysis of background factors and parole behavior of 9,729 cases paroled from the same prison system between 1925 and 1935. After making *ex post facto* adjustments to handle the difference in violation rates of parole for men released during the earlier and later periods (1925-1935 and 1939-1940) Hakeem con-

26. MONACHESI, ELIO D., *A Comparison of Predicted with Actual Results of Probation*, 10 AMER. SOCIOLOGICAL REV., 26-31, Feb. 1945.

27. HAKEEM, MICHAEL, *The Validity of the Burgess Method of Parole Prediction*, 53 AMER. J. OF SOCIOLOGY, 376-386, March 1948.

tends that predicted behavior on parole coincides remarkably well with actual behavior on parole and "the prediction table has been validated in this instance."²⁸

These follow-up studies, in addition to a few unpublished studies referred to now and then in the literature, have produced conflicting results which makes it difficult to assess the validity and utility of tables to predict recidivism. If such techniques are to be used in the administration of criminal justice, then it must be demonstrated that an accuracy in the prediction of behavior is achieved far beyond that which is now achieved by informal and unsystematized methods. It becomes necessary, therefore, to seek to establish the superiority of systematic, scientific prediction of recidivism over current methods employed by officials to dispose of offenders. This may only be done by an evaluation of the efficiency of predictive instruments. A method which would permit such an evaluation has been developed by Lloyd E. Ohlin and Otis Dudley Duncan.²⁹ By producing what they call the percentage reduction in error of prediction there is made available a means to measure the efficiency of prediction tables and to compare the effectiveness of different methods for the construction of such tables. In brief, the measure of percentage reduction in error of prediction is the ratio of the error in predictions based upon any method of scoring predictors to the ratio of error in predictions, made on the basis of total over-all rates of favorable or unfavorable responses of offenders to any specific form of correctional treatment. In other words, the index proposed by Ohlin and Duncan renders possible a measurement of the degree to which any particular prediction device improves upon the accuracy of predictions based solely on knowledge of an over-all violation rate.

Armed with this index, Ohlin and Duncan proceed to test the efficiency of most of the principal prediction tables in existence and the results of the test prove devastating in many instances. They found only two prediction tables for which the reduction in error in prediction went beyond 25 per cent. "Not a few prediction tables have been published where the reduction of error is zero!"³⁰ All of which is taken to mean that "the routine application of these techniques (prediction tables) to the types of data usually secured is in no sense a guaranty of substantial improvements in prediction over the crudest method available—prediction from total rates."³¹ Follow-up studies fare no better. In fact,

28. HAKEEM, MICHAEL, *op. cit.*, p. 386.

29. OHLIN, LLOYD E., AND DUNCAN, OTIS D., *The Efficiency of Prediction in Criminology*, 54 AMER. J. SOCIOLOG., 441-451, March, 1949.

30. OHLIN, L. E. AND DUNCAN, O. S., *op. cit.*, p. 445.

31. OHLIN, L. E., AND DUNCAN, O. S., *op. cit.*, p. 445.

when the percentage reduction in error was applied to the results of some studies, it was found that more accurate predictions could have been achieved by employing knowledge of an over-all violation rate instead of predictive devices. This was true of the follow-up studies reported by Hakeem and Monachesi. The results thus obtained when the efficiency of prediction tables is measured in terms of the accuracy of the predictions based upon them indicate that the objectives which were expected to be achieved by the utilization of systematic prognostic devices in the administration of criminal justice are still beyond reach.

FACTORS RELATED TO THE EFFICIENCY OF PREDICTION INSTRUMENTS

Many are the reasons that we may point to in accounting for the inefficiency of established prediction techniques. Many social scientists have repeatedly suggested that accuracy in prediction is necessarily dependent upon the accuracy of the information utilized as predictors of behavior. Many of the prediction tables that are now available contain scores based upon predictors extracted from the information contained in the official files of the offender. The reliability of such information remains an open question. But even if the accuracy of the information contained in official files could be unqualifiedly vouched for, there would still remain the problem of classifying such information into reliably standard classification categories. As every one knows, words carry different meanings to different people, and even the same person may differ from time to time in the way he interprets the very same words. What is especially needed in this respect is the utilization of existing scales or the invention of new scales that render possible the measurement of the social and personal characteristics in a reliable fashion.

The utilization of information contained in the usual case record as the basis of prediction carries with it another serious limitation upon the efficiency of predictive devices. The number, as well as the nature of the predictors which may be employed in the prediction of behavior, are necessarily restricted by the information made available in the record. No one can safely say that the predictors induced from such information are the ones most significantly related to predicted behavior. In short, it is at present impossible to say that the many factors employed in the construction of prognostic instruments are the most crucial and significant factors associated with behavior. This state of affairs will remain unchanged until efforts are made to tap other sources of information regarding the personal and social characteristics of offenders.³²

32. The Gluecks from the very beginning of their work have utilized other than case records for information about individuals included in their studies.

Nor are we able to measure the degree to which the predictors chosen remain stable for any period of time. Obviously, if it can be demonstrated that factors which are utilized for prediction purposes lose their prognostic ability over a period of time, any prediction device which is based upon such unstable predictors will be found inadequate.

Another reason that may account for the inefficiency of prediction instruments stems from the fact that no one has been completely successful in handling the dynamic character of human behavior. As already indicated by Laune, there is need to include amongst predictors factors that are manifestations of the more subtle aspects of personality, and the mental and emotional life of the offender.

There is also need to develop a method which would make possible to adjust for changes in social conditions which transpire to affect the administration of criminal justice in a particular community. Predictions that are made in any field of human behavior will be materially affected if the conditions under which such predictions are made become modified. Thus, if parole violation rates change because of changes in personnel or in the policy of parole administration, then violation rates used to predict outcome of parole which are consistent with one set of conditions cannot be utilized to predict outcome of parole when conditions are changed. This problem must be solved before the prediction of recidivism is made more efficient.

Although the reasons cited to account for the inefficiency of prediction devices pose a number of difficult problems that await solution, some efforts have been made which seem to offer a way out of some of the difficulties that stand in the way of accurate predictions. As noted above, the nature and source of the data utilized in the construction of prediction instruments may constitute an important reason for the inefficiency of such instruments. Consequently any scaling device which would tend to standardize data to be used as predictors might result in more efficient predictors. Noteworthy in this connection is the use made by Jerry H. Clark of the *Minnesota Multiphasic Personality Inventory* to differentiate members of the armed forces who took leave from their units without permission more than once from those who committed the offense only once.³³

The *Inventory* contains 550 items.³⁴ The responses made to these items by the subject reveal how closely he resembles a group of diagnosed

33. CLARK, JERRY H., *Application of the MMPI in Differentiating A.W.O.L. Recidivists from Non-recidivists*, 26 JOUR. OF PSYCHOL., 229-234, 1948.

34. By HATHAWAY, STARKE R., AND MCKINLEY, J. CHARNLEY. Published by the Psychological Corporation, New York, New York. For a discussion of how these scales were constructed and how they were standardized, see: HATHAWAY, S. R., AND MCKINLEY, J. C., *A*

abnormals on twelve scales. In addition, the *Inventory* includes a "P" score which is simply the number of items to which the subject failed to respond. Two of the scales validate the entire record. These are the L and F scales. Elevated L scores disclose that the subject attempted to choose responses that place him in a socially approved position. Such scores suggest that scores on other scales are lower than they should be. The F score is an index of the degree to which the subject was careless and/or failed to comprehend the meaning of the items. The K scale is intended to measure the extent to which the testee was defensive, evasive, or overly self-critical. The K factor sharpens the discriminatory power of five clinical scales. The remaining nine scales measure the similarity in response of the subject and diagnosed abnormals suffering from the emotional and personality disturbances suggested by the following scale titles: Hs, hypochondriasis; D, depression; Hy, hysteria; Pd, psychopathic deviate; Mf, masculinity-femininity; Pa, paranoia; Pt, psychasthenia; Sc, schizophrenia; Ma, hypomania.

The *Inventory* was administered to 100 randomly selected soldiers, 55 of whom had been A.W.O.L. more than once, and 45 of whom had committed this offense only once. An analysis of the way the two groups of men responded to the items of the inventory revealed that 24 items of the *Inventory* differentiated the two groups. The results suggest that recidivists and non-recidivists may be selected on the basis of a 24 item scale derived from the item pool of the *Inventory*.

The present writer has also experimented with the *Inventory* in order to determine its utility in the prediction of parole violation of boys released from a state training school and of probation outcome for female juvenile delinquents. The results obtained so far indicate that 41 items of the *Inventory* significantly differentiate parole violator from non-violator of parole. Forty-nine items of the *Inventory* were found to differentiate significantly juvenile female probation violators from non-violators. The differences in response made by violators and non-viola-

multiphasic personality schedule (Minnesota): I. Construction of the schedule. 10 JOUR. OF PSYCHOL., 249-254, 1940. *A multiphasic personality schedule (Minnesota): II. A differential study of hypochondriasis.* 10 JOUR. OF PSYCHOL., 255-268, 1940. *A multiphasic personality schedule (Minnesota): III. The measurement of symptomatic depression.* 14 JOUR. OF PSYCHOL., 73-84, 1942. MCKINLEY, J. C., AND HATHAWAY, S. R., *A multiphasic personality schedule (Minnesota): IV. Psychasthenia,* 26 JOUR. OF APP. PSYCHOL., 614-624, 1942. *The Minnesota Personality Inventory. V. Hysteria, hypomania and psychopathic deviate.* 28 JOUR. APP. PSYCHOL., 153-174, 1944. *The Identification and Measurement of the Psychoneuroses in Medical Practice.* 122 J. A. M. A., 261-267, 1943. HATHAWAY, S. R., AND MCKINLEY, J. C., *MANUAL FOR THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY.* Minneapolis: University of Minnesota Press, 1943. MEEHL, PAUL E., AND HATHAWAY, STARKE R., *The K factor as a suppressor variable in the Minnesota Multiphasic Personality Inventory.* 30 JOUR. APPL. PSYCHOL., 525-564, October, 1946.

tors to the items are designated as significant when the critical ratios are 2.0 or more.

Despite what many persons may think of measuring devices like the *Inventory*, these instruments have at least the virtue of being standardized. A score made on the *Inventory* makes unnecessary any elaborate interpretation of verbal or written symbols. There is no need to force such scores into classificatory categories which are in turn usually defined in words. Furthermore, there is reason to believe that the responses made to the items of the *Minnesota Multiphasic Personality Inventory* are manifestations of the more subtle aspects of personality structure. The utilization of the *Inventory*, or other scaling devices like it, would therefore tend to make it less necessary to confine the search for predictors of recidivism to official case records and files. In addition, through their use, other and perhaps more meaningful predictors of behavior might be found. How well the data derived from personality scales employed to measure the characteristics of offenders predict recidivism cannot be known until such predictions are empirically verified.

The effective prediction of recidivism is still to be attained. As our review of the principal research efforts of American social scientists has suggested it is now known that certain of the personal and social characteristics associated with recidivism may be summarized and cast into expectancy tables of recidivism for selected groups of offenders. These prediction tables merely reflect varying patterns of personal and social characteristics of violators and non-violators of specific correctional treatment programs. When data basic to prognostic devices have been employed to predict recidivism for another group of offenders, the results have been contradictory. Some studies produce results which suggest that prediction instruments achieve rather accurate predictions while other studies show that predictions based upon expectancy tables are no more accurate, and sometimes less accurate, than the predictions based upon a known over-all violation rate. It is apparent that many of the factors included in a battery of predictors do not differentiate in a meaningful manner between violators and non-violators. If predictive instruments are to be extensively employed in the administration of criminal justice, scientists must demonstrate that decisions predicated upon such instruments are wiser than those that are made without the aid of such instruments.