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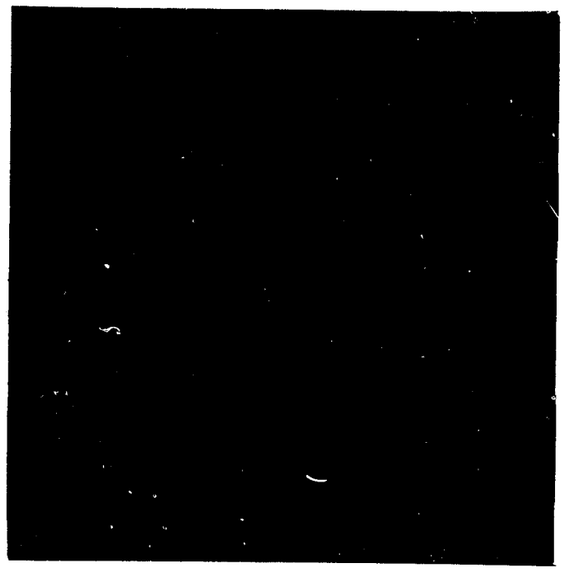

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June, 1975

Grants:

72 NI-02-0001 and 74 NI-02-0002

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ABSTRACT

In collaboration with members of the staff of the Division of Preventive Psychiatry, the Pilot City Program undertook research concerning the recruitment and screening of applicants to the Rochester Police Department. Working with the cooperation of the police department, the investigators compiled an extensive data bank on applicants to the police force since 1965. For those who successfully passed through various screening stages and were accepted on the police force, performance records of various types were compiled from police records.

This report presents a quantitative description of the recruitment funnel and examines attrition at each stage in screening. Psychiatric and psychological data on the population of applicants are analyzed and used to test whether meaningful psychological differences may be discerned between those individuals offered appointments to the police department and those who are refused. Also examined is the weight attached by decision makers to psychiatric and psychological recommendations, and a causal model is developed to explain how several factors operate to influence final determinations on the appointment of police candidates.

The preparation of this document was partially supported by Grants 72 NI-02-0001 and 74 NI-02-0002 from the National Institute of Law Enforcement and Criminal Justice of the Law Enforcement Assistance Administration, United States Department of Justice. Statements or conclusions contained in this paper do not necessarily indicate the concurrence of the Institute.

Publication #32
Special Study #8

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the cooperation of the Rochester Police Department and the Monroe County Civil Service Commission in making available certain of the data analyzed in this paper. Roberta C. Cronin and Lois K. Horwitz of the Pilot City Program generously read and criticized an earlier draft, with the result that the paper, thanks to their thoroughness, has been considerably improved.

Introduction

Mental health screening of applicants for police work has become increasingly widespread since the 1940s. The extension of this practice has been based on the presumed relevance of psychiatric and psychological data to the assessment of an individual's suitability for the police role. While there can be no doubt of the importance of preventing appointment of disturbed or potentially disturbed individuals, very little systematic effort has been invested in the description or evaluation of various screening programs. There are important reasons current screening practices should be studied in greater depth. First, clinicians often do not recognize systematically the criteria used in their own decisions, ascribing judgments to "clinical horse sense". This makes it difficult to standardize practices, and introduces irrational variability into screening criteria among clinicians and between programs. Second, the high costs of psychological assessment must be justified by public officials, in the absence of evidence, on the grounds of hypothetical risks incurred by its absence. Obtaining such evidence, even on the basis of an examination of clinical records, is not an easy task, because practical considerations usually dictate that large numbers of applicants are screened out of the selection process prior to psychological examination. Only the behavior of the very selected sample of candidates finally examined must then serve as the basis for determining the successes or failures of mental health screening. Whether this restricted mental health screening makes sense, and how it makes sense, are questions its evaluation must seek to answer.

In the present paper we report preliminary results from a study recently undertaken to consider questions about the place of psychological assessment in the screening of candidates for police work. We attach particular interest to the sociological characteristics of the screening funnel for the population of applicants at hand. These characteristics are regularly ignored in other examinations of screening, even though it is quite clear no interpretation of the significance of particular elements in a screening program can be made except in relation to the characteristics of the whole screening process. In the pages that follow we shall describe the evolution of the screening program operating in Rochester, New York, and present a quantitative description of the whole screening funnel. Using MMPI profiles, we shall also present a psychological description of the population of applicants, both those eventually successful and unsuccessful.

These data will enable mental health personnel in other cities to compare their own practices with those reported here and will offer evidence of the clinical criteria operating to eliminate candidates. We shall conclude the paper with an effort to estimate the parameters of a causal model of the final phases of the screening process, offering thereby evidence of the weight attached by public officials to the recommendations derived from mental health screening.

SELECTION OF CANDIDATES IN ROCHESTER, NEW YORK

In 1962, the Chief of the Rochester Police Department approached representatives of the mental health professions for assistance in choosing among police applicants. His aim was to obtain help in

screening out those candidates who met other requirements of the Civil Service Commission but whose behavior following appointment as policemen left much to be desired. The behavioral deficiencies of some of these otherwise suitable candidates were apparent even before appointment, but their political backing was strong enough to make it difficult for the Chief to refuse them on the strength of his assessment of their psychological functioning.

In most of the cases of concern to the Police Department, the men appointed, though apparently motivated and well qualified, were simply not psychologically suited for police work. These men soon demonstrated their inability to exercise or respond to authority, to tolerate shift work, or to handle tactfully the anxiety and anger-provoking situations so much a part of their duties. Their anxiety rose rapidly after release from the Training Academy, and unfortunately often gave rise to unacceptable public behavior.

The psychiatrist chosen by the Civil Service Commission was a prominent local practitioner with a national reputation in occupational psychiatry. He discussed the project with a psychologist affiliated with the University of Rochester Department of Pyschiatry and the two hit upon the pragmatic, though incomplete, formula of an MMPI examination followed by a psychiatric interview. The MMPI was chosen as the best available broad-scale, well-researched personality inventory for the detection of psychopathology. The fact that it could be self-administered made it all the more attractive. In 1963 the Division of Preventive Psychiatry at the University assumed responsibility for the psychiatric evaluations. Each candidate was seen separately by two psychiatrists,

who together formulated recommendations about each case. There has been no change in this procedure since its inception.

The results of their examinations, along with other information about candidates, formed the basis for decisions regarding each applicant. These decisions were made at a meeting, whose participants included the Police Chief, his background investigators, representatives of the Civil Service Commission, and the mental health professionals. The global judgments of the investigators and the mental health examiners were reviewed and a final decision was made (by the Chairman of the Civil Service Commission) to accept or reject candidates.

Between 1962 and 1973 approximately 2,800 men made application to the force and were appointed. Though there has been no change in screening procedures employed by police or mental health professionals, other local factors have markedly influenced the demographic characteristics of successful applicants and the number of applicants from one year to the next. Among these were a large-scale riot in 1964, the rise of unemployment in the later 1960s, and the precipitous rise in salary for patrolmen during the same period.

SCREENING FUNNEL

Successful applicants to the Police Department pass through approximately seven decision points in the screening process before they are appointed. At each of these points manifestly different criteria are invoked as standards for evaluating their suitability for police work. Candidates may be dropped from further consideration after each of these points. The flow of applicants through the screening

process is thus marked by stages, through which pass successively smaller numbers of individuals. Though the analogy is not exact, we have referred to this progressive diminution in flow as a screening funnel.

Like all judgments, screening processes are matters of measurement. At each stage individuals are classified by various means into groups, the groups are ranked, and thresholds or "passing" levels are established which collapse the more precise classifications into a "pass-fail" dichotomy. A series of stages having the funnel properties we have discussed above thus resembles what students of attitude measurement call a cumulative scale: to have passed the nth stage implies having passed each of the n-1 stages prior to it. This characteristic of the screening process means that screening should have certain theoretically desirable results: the most important of these is that individuals who pass through all of the stages successively should be somehow superior to those who have failed at any point along the way. Whether this is in fact so is an empirical question referring back to the adequacy of measurement at each of the stages and to the correctness of the criteria used to evaluate. These characteristics and assumptions of the screening process make it useful to examine whether the process in fact differentiates individuals on grounds enabling a prediction to their actual performance as police officers. Besides the various issues surrounding the intrinsic meaning of different evaluation criteria and the adequacy of different measurement strategies, the final question is whether each stage or all taken together differentiate meaningfully among individuals in regard to their work.

Unfortunately, answers to a number of questions will never be available to us. Individuals screened out for reasons of failing to meet arbitrarily set physical or cultural criteria (for example, height, education, etc.) are never permitted to test their actual fitness to do police work, and thus cannot be compared to those accepted to do it. Likewise, because of the step-like phases of screening, all individuals who make application do not progress far enough to be measured on all of the criteria. Thus, an individual eliminated early for reasons of height might have outperformed all others on a later test but was not permitted to take it. This also prevents complete and comparable analysis of applicants. Finally, the self-selection of applicants produces a sample which is not representative of the larger community. Precise specification of the differences between the population and the sample would be necessary for generalization about the generic effects of screening per se.

INITIAL RECRUITMENT: FILING AN APPLICATION

Recruitment to the Rochester Police Department occurs on an irregular basis when openings are created by retirement, resignation, dismissal or manpower expansion. The decision to hire new personnel is followed by a public announcement of an examination date. In the past, the Department has distributed as many as 1,000 announcements of these examinations, along with recruitment propaganda, to local community groups, schools, and public institutions (libraries, etc.) in the area. The Police Department has been an active recruiting agent in the attraction of applicants. It has operated a mobile information center ("Recruitmobile") throughout the city, solicited

free publicity on television, and encouraged its personnel to stimulate interest in police careers among youth.

To establish their eligibility, applicants must first submit pertinent information about themselves to the Civil Service Commission. They must be between the ages of 20 and 29 (veterans may be credited with up to six years extension for active duty time), have a high school diploma or its equivalent, be a U.S. citizen, reside in Monroe County or one of five contiguous counties, be 5'7 1/2" or taller, have no record of felony convictions, and, until recently, be male. Their applications at this stage are reviewed routinely by clerical staff or personnel technicians with the Civil Service. Disqualified candidates are notified by mail of their rejection, and are permitted a period of time to appeal the rejection or to claim special circumstances.

"WRITTEN" EXAMINATION

Those who are not disqualified by the initial review of applicants are invited to take a "written" examination. This is a standard aptitude test, changed each year, prepared by a national testing agency for the city and designed especially for police applicants. There is no fixed "passing" grade on this test and the actual passing grade (though always "75", after suitable adjustment) is changed from year to year to admit enough candidates to further screening to satisfy the current manpower needs.

MEDICAL EXAMINATION

Candidates who "pass" the written examination are then invited

to a medical examination. The standards used in this examination, developed by New York State (some are part of state law), include the conventional "parameters" of height-weight ratios, eyesight, etc. Medical examination is otherwise extremely thorough. Most rejections at this screening point are attributable to impaired eyesight (uncorrected visual acuity of less than 20/40), faulty color perception, height-weight imbalance, and abnormal blood pressure. Doctors have the discretion to pass candidates provisionally at this point and this is sometimes done for cases only slightly under- or overweight on condition of their correcting their deviation from the official standard.

PHYSICAL AGILITY

Given as a rule at the same time as the medical examination, the physical agility examination demands the candidates satisfy standards established by the state's Municipal Training Council. These standards apply to the applicant's aptitude for bar "chinning", high jump, broad jump, and the quarter mile run.

While the medical examination usually produces a pass-fail judgment, the physical agility and written examinations produce numerical scores that are combined into a judgment as to whether the applicant's name will be placed on a list of candidates invited to further screening. The written examination constitutes approximately 70% of this final score, the physical agility 30%. Putting the two scores together with these weights enables screeners to rank all applicants on the list. These rankings are part of the record sent on to subsequent decision points.

BACKGROUND INVESTIGATION

Part of the standard responsibility of the Police Department's Detective Bureau is to conduct thorough investigations of all applicants surviving to this point in the screening. Detectives visit applicants, their families, schools, neighbors, and employers, and conduct a complete check of credit, military service, and occupational history. All of this information is the basis of a recommendation the detective makes. The detective's report almost always includes subjective impressions of the candidate's seriousness and general aptitude for police work and may include a clear-cut judgment that the candidate should be dropped. These judgments, from the perspective of an individual experienced in the realities of police work, are seriously regarded by those in positions to pass on the candidates at later points. The recommendations are considered first by the Police Department and the Civil Service Board. If the background investigation turns up something about the candidate that the Civil Service Board feels disqualifies him, he is not sent on for mental health evaluation.

PSYCHOLOGICAL TESTING AND PSYCHIATRIC INTERVIEW

At about the same time that the background investigation is undertaken, candidates are also required to complete the MMPI, a 500+ item objective personality scale. The personality profile yielded by the MMPI is interpreted by a clinical psychologist. The analysis is carried out "blind", i.e., without any knowledge of the candidate's background, and a brief report summarizing the major findings is forwarded to the psychiatric interviewers.

The psychiatric interviews are then done with data in hand from both the MMPI and the detective's background check. Two psychiatrists see each applicant, separately but not independently of each other. This is done to provide a check on the individual psychiatrist's judgment. As noted above, the background investigation includes demographic information as well as sketchy family history and records of school, military, and occupational performance. This information is heavily relied on by the psychiatrists to focus their short interview (maximum 30 minutes) on areas most likely to provide relevant material for diagnosis and prognosis.

The psychologist and the psychiatrists all make global ratings of the applicants, using simple four-point scales, with respect to present psychopathology (1=severe psychopathology; 4=no psychopathology) and prediction of performance as policemen (1=excellent; 4=poor). The psychologist makes his rating on the basis of his MMPI interpretation alone. The psychiatrists make their ratings after reviewing this source of data as well as the background check and their interviews.

CIVIL SERVICE MEETING

Following this, the Civil Service Board calls a meeting of various individuals involved or interested in the screening process -- the psychiatrists and psychologists, the detectives, representatives from the Police Command and the Civil Service Board. Candidates are discussed individually and an eligibility list is established and certified. The successful applicant then has the option of accepting

or declining appointment.

QUANTITATIVE DESCRIPTION OF THE FUNNEL

These several steps in the screening process may be diagrammed as in Figure 1. The diagram suggests the temporal ordering of the phases. The D's indicate the various points at which decisions are made to disqualify or pass applicants. These decisions are the major source of attrition in the original cohort, but they are supplemented by applicants' personal decisions throughout the funnel to remove themselves from consideration. These latter decisions are usually manifested by the failure of candidates to appear for a phase of screening to which they had been invited.

Sampling the Applicants

Quantitative description of the funnel, and particularly its phase-specific attrition rates, may be constructed from samples of applicant's records put together for this research. The sources of data available to examine the screening process included the approximately 2,816 applications filed with the Civil Service since 1964. Of these 2,816 cases, 615 progressed to the point where they were investigated by police detectives and were subject to at least part of the mental health screening process. Our analysis is based on a saturated sample of the records of these 615 cases, plus an additional sample of 739 records from among the applicants who were eliminated from screening prior to the background investigation. The latter records were selected by sampling randomly from each annual cohort after eliminating the

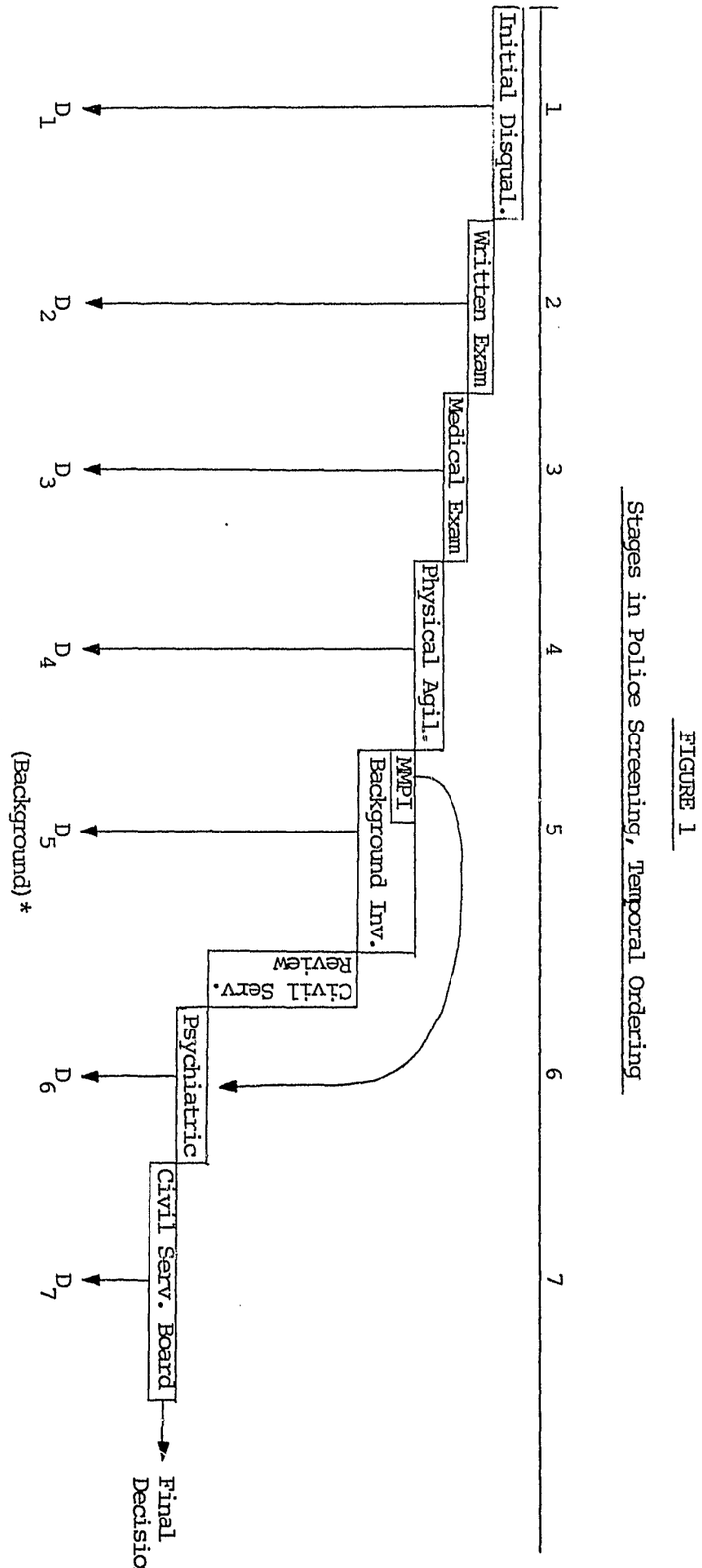


FIGURE 1

Stages in Police Screening, Temporal Ordering

*At D_5 are excluded only those eliminated by the Background Investigation. The MMPI does not eliminate applicants at D_5, but feeds into D_6.

records of those who passed into our saturated sample. We thus have an effective sample of 739 of the individuals who made application to the Civil Service, plus 615 further records of those who got to the background check.

The peculiar nature of this sampling (dictated by extraneous considerations) causes us to resort to some oblique but nevertheless simple arithmetic in order to estimate the probabilities of attrition associated with each decision point. Thus, estimates of attrition based on the random sample will be biased because the sampling itself was done from a depleted population. Thus, of the 2,816 Civil Service records, the sample was drawn from 2,201 cases (the number remaining after subtracting the records of the 615 individuals who made it to the background investigation, i.e., 2,816 - 615 = 2,201). There is a simple way to adjust for this bias. We are interested in estimating the rate of attrition associated with each screening phase, that is, the probability of failing to be passed on from stage $\underline{i}$ to stage $\underline{i+1}$, given having survived from $\underline{i-1}$ to $\underline{i}$. Phase-specific attrition rates of this sort, based simply on observed sample frequencies, can be constructed by calculating

$$n_i \; / \; 739 - \sum_{K=1}^{i-1} n_K$$ where n is the observed frequency of attrition at the $\underline{i}$th decision point. Since we know such estimates would be biased upward, an adjustment must be made in the frequencies entered into this calculation so as to project to the total population. If we call the estimated frequency of attrition at the $\underline{i}$th stage $\hat{n}_i$, then $\hat{n}_i = (2{,}201 \times n_i)/739$. After obtaining these estimates, we may

project to the population to obtain adjusted rates of attrition, $\hat{p}_i$, by calculating for each stage

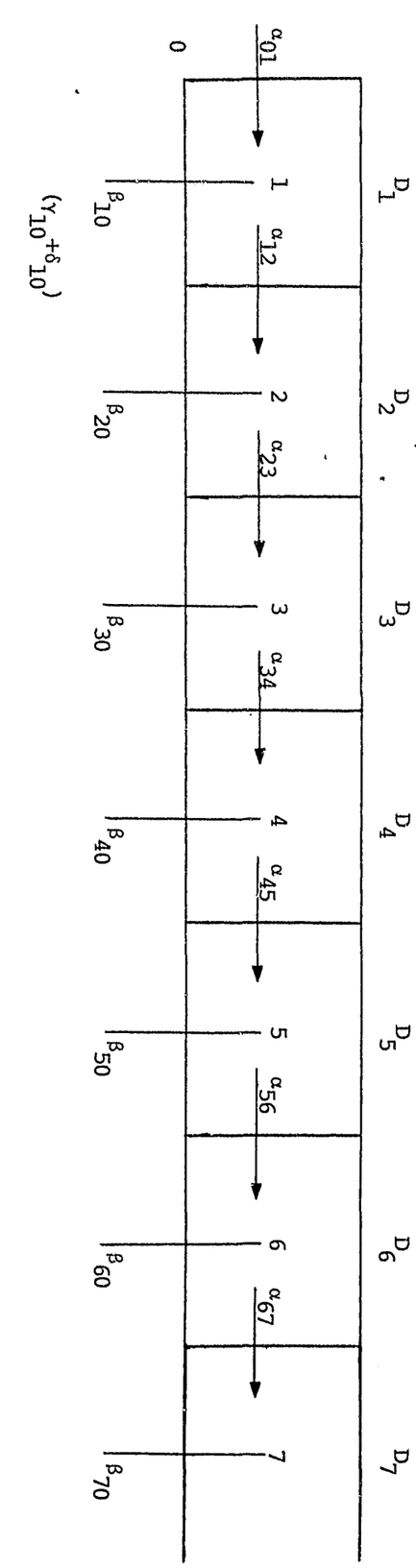
$$\hat{p}_i = \hat{n}_i / 2{,}816 - \sum_{K=1}^{i-1} \hat{n}_i. \qquad \text{(Equation 1)}$$

These calculations are carried out in Table 1, which reports observed and estimated frequencies of attrition as well as the estimated (adjusted) rates of attrition associated with each decision point in the screening funnel. The whole funnel may be diagrammed as in Figures 1 - 2. In Figure 2, particularly, we have represented the flow through the stages in the funnel as the result of the application of a series of probabilities of success (α_i) or failure (β_i) to the screening members of the candidate cohort at each successive stage. These two parameters may be estimated with our data, using Equation 1, and the results are reported in Table 1. (In Table 1, the $\beta_i = \gamma_i + \delta_i = \hat{p}_i$.)

If we consider the attrition at D_1 to be the product of applicant ignorance (these are individuals eliminated on the basis of publicized standards), and if we collapse D_5 and D_6 into a single stage (they are mutually contaminated decisions), the total attrition rates in the funnel appear in a monotonically decreasing order of magnitude. (See Table 2.) The highest probabilities of elimination attach to the earliest phases of screening. These are the phases of screening based primarily on the application of clear-cut physical or legal standards. By the end of the physical agility testing, only about 22.3 percent of the original applicants have not been eliminated. This is the fraction who are investigated by the police department and who receive mental health screening. As may be seen from Table 3,

FIGURE 2

Schematic Representation of the Screening Process



α_{ij} = proportion successful at D_i, sent on to state j.

β_{io} = proportion lost at i, sent to 0, where $\beta_{io} = \gamma_{io} + \delta_{io}$.

γ_{io} = proportion who "fail" at D_i, sent to 0.

δ_{io} = proportion who drop-out at i.

TABLE 2

Reorganized Attrition Rates

Stages in Screening	Sources of Attrition		Total Attrition
	Failure (γ_i)	Dropping-out (δ_i)	
D_2	24.7	25.9	50.6
D_3	25.8	12.9	38.7
D_4	12.8	9.5	22.3
$D_5 + D_6$	14.6	1.2	15.8
D_7	0.0	12.3	12.3

TABLE 1

Phase-Specific Rates for The Screening Funnel

Stage of Screening	Attrition Observed in Sample[1]			Attrition Projected to Total Population (2,816)[2]			Estimated Phase-Specific Attrition Rates[3]		
	# Failing	# Dropping-out	Total Attrition	# Failing	# Dropping-out	Total Attrition	Failure (γ_i)	Dropping-out (δ_i)	Total (β_i)
D_1	68	0	68	203	0	203	7.2	0.0	7.2
D_2	217	227	444	646	676	1,322	24.7	25.9	50.6
D_3	112	56	168	333	167	500	25.8	12.9	38.7
D_4	34	25	59	101	75	176	12.8	9.5	22.3
D_5	6	0	6	6	0	6	1.0	0.0	1.0
D_6	83	7	90	83	7	90	13.6	1.2	14.8
D_7	0	64	64	0	64	64	0.0	12.3	12.3

[1]Attrition observed in sample based on N = 739 for D_1 through D_4; attrition observed in final phases D_5 through D_7, based on N = 615.

[2]Projected attrition from D_1 to D_4, $\hat{n}_i$ is equal to $\frac{\text{Observed Attrition} \times 2{,}201}{739}$. Attrition for D_5 through D_7 is based on observed numbers, since sampling for these stages was saturated.

[3]If projected attrition equals $\hat{n}_i$, then estimated phase-specific attrition rates ($EPSAR_i$) equals $\frac{\hat{n}_i}{2{,}816 - \sum_{k=1}^{i-1} \hat{n}_k}$

TABLE 3

Estimated Percentage of Original Cohort of Applicants Surviving After Each Screening Decision

Stage of Screening	Total Projected Attrition at i	Total Surviving D_i	Estimated % of Original Cohort Surviving D_i
D_0		2,816	100.0
D_1	203	2,613	92.8
D_2	1,322	1,291	45.8
D_3	500	791	28.1
D_4	176	615*	21.8
D_5	6	609	21.6
D_6	90	519	18.4
D_7	64	455	16.2

*It should be pointed out that this number is the population total at this stage. From this point on, the figures are based on saturated sampling.

only about three percent of the original group of applicants are eliminated on grounds of their mental health. Sixteen percent survive all of the screening.

Though there is an obvious interdependence between components of the attrition rates, the figures are interesting to compare. It appears that $\gamma_i > \delta_i$ throughout the funnel, until D_7. D_7 probably has a substantial fraction of drop-outs because of the waiting period often separating screening and final appointment to the police force. Thoughout the funnel, everyone remains vulnerable to competing opportunities in the job market. Coupled with boredom and lost interest, this exposure is a systematic source of loss not only from among those in the screening funnel but also from among men already appointed to the police force. Thus, while the funnel screens out individuals who are deemed undesirable by the standards of the moment, the time it involves -- often a period of three to six months -- leaves the candidates exposed long enough to produce a substantial amount of attrition among those best equipped to compete in the job market.

PSYCHOLOGICAL DESCRIPTION OF APPLICANTS

The small fraction of original applicants who survive to the mental health phases in screening actually number, over the years in our sample, about 600. We are, therefore, in a position to consider these individuals in some detail. Two problems are of special interest: first, what meaningful psychological differences may be discerned between those individuals eventually offered appointments to the police department and those who are refused appointment? Our data enable us

to describe these two groups in terms of their profiles on the MMPI and their psychiatric ratings. Second, we shall later want to ask how the information gathered in the last phases of screening cumulates into the final decision to appoint. What, in particular, is the weight attached by decision-makers to psychological and psychiatric recommendations?

One approach to the evaluation of MMPI profiles entails an examination of the frequency with which any particular scale is the highest of the ten basic MMPI scales. For each individual the scale on which he has his highest scores is then identified and the distribution or frequency of these high points across a population can then be examined. Considerable information is available in the literature on the significance of specific high point codes and 2-point (highest and second highest) codes. Tables 4 and 5 present the distribution of highest and second highest scales for the two groups. Of particular note is the data for scale 4 (psychopathic deviate) and scale 9 (mania). Among those offered an appointment on the police force, 27% had scale 4 as their highest scale and 26% had scale 9 as their high points. This yields a total of 53% who had their high point on one of those two scales. Among those who were refused an appointment, 43% had scale 4 as their highest scale, and an additional 29% showed scale 9 as their high point, yielding a total of 72% with one or the other of those two scales as the high code point. There appears thus to be a considerably greater frequency of 4 or 9 high point codes among those refused appointments compared to those offered a position.

Examination of the 2-point high codes reveals that 25% of

Table 4

Highest and Second Highest MMPI Scale Frequencies for "Accepted" Candidates

	High Point											
MMPI Scale	1 Hs	2 D	3 Hy	4 Pd	5 MF	6 Pa	7 Pt	8 Sc	9 Ma	10 Si	N	%
Second Highest Point:												
1	0	3	7	3	0	0	0	0	3	0	16	3
2	1	0	9	21	6	2	1	1	11	3	55	11
3	1	10	0	44	10	5	4	5	26	0	105	21
4	1	5	22	0	9	1	1	4	31	2	76	15
5	0	4	9	14	0	2	3	1	24	3	60	12
6	0	2	5	7	7	0	2	2	9	0	34	7
7	0	1	4	7	5	0	0	2	8	0	27	6
8	0	2	8	9	8	0	4	0	14	0	45	9
9	0	11	7	25	10	5	1	2	0	1	62	13
10	1	1	0	2	0	1	1	2	2	0	10	2
N	4	39	71	132	55	16	17	19	128	9	490	
%	1	8	14	27	11	3	3	4	26	2		

Key:

Scales - Defined

1 - Hypochondriasis
2 - Depression
3 - Hysteria
4 - Psychopathic Deviate
5 - Masculinity-Femininity
6 - Paranoia
7 - Psychasthenia
8 - Schizophrenia
9 - Mania
10 - Social Introversion

Table 5

Highest and Second Highest MMPI Scale Frequencies for "Rejected" Candidates

MMPI Scale	High Point 1 Hs	2 D	3 Hy	4 Pd	5 Mf	6 Pa	7 Pt	8 Pc	9 Ma	10 Si	N	%
Second Highest Point:												
1	-	-	-	2	1	-	-	-	-	-	3	3
2	-	-	1	2	1	-	-	-	3	-	7	7
3	-	-	-	10	-	-	2	1	5	-	18	18
4	-	-	4	-	2	1	-	-	9	-	16	15
5	-	2	1	3	-	-	-	-	4	-	10	10
6	-	-	1	2	1	-	-	1	3	-	8	7
7	-	1	-	3	-	-	-	-	1	-	5	5
8	-	-	1	5	-	-	1	-	1	-	8	8
9	-	-	1	16	1	1	-	3	-	-	22	22
0	-	1	-	-	-	-	-	-	3	-	4	4
N	0	4	9	43	6	2	3	5	29	0	101	
%	0	4	9	43	6	2	3	5	29	0		

those denied an appointment had 2-point high codes of 4-9 or 9-4. This compares to 11% with either of those 2-point codes among those offered appointments. It would appear, then, that whatever personality factors are associated with these scales are related to the decisions made in the screening process. Those MMPI scales which are considered to be more sensitive to specific symptomatic psychopathology, such as scale 2 (depressive symptoms), scale 7 (anxiety and obsessive symptoms), and scale 8 (bizarre thinking and psychotic distortion) appear to show little difference between those offered and those denied police positions.

An examination of actual mean scores for each of the 10 clinical scales was also conducted and these data are seen in Table 6. These data indicate that on three scales (4, 6, and 9) the "refused" group had mean scores significantly higher (by t-test) than the mean scores obtained by those who were offered appointments. Of these three, Scale 6 (suspiciousness and interpersonal touchiness) was not previously noted to be any more frequently scored as a high or second highest code among those refused positions. Two of these, however, (scale 4 and 9) were noted to be more frequent high points among those not offered positions. Scale 6 would appear, then, to have had a sufficiently frequent elevation to yield this significantly higher mean score. These data would indicate that the group which was "screened out" could be characterized as significantly more inclined toward hyperactivity and impulsivity (scale 9); towards difficulty with authority and a potential for antisocial attitudes (scale 4), and towards interpersonal hypersensitivity and distrust (scale 6). (Other features associated with the fact of acceptance or rejection will be examined

elsewhere.)

The role of mental health screening is considered to be an advisory one. The final selection decisions are the responsibility of the Civil Service Board in cooperation with the Police Department. These agencies have, since the inception of the screening procedure, had the ultimate authority for the appointment of police officers. Yet the judgments and advisory opinions of mental health professionals seem to have carried considerable, albeit not necessarily decisive, weight in the final selection decisions. On the basis of the psychiatric interview, each candidate was rated on a 1 to 4 scale reflecting the perceived degree of maladjustment or personality disorder (1 representing a significantly symptomatic state and 4 representing no evidence of disturbance). The distribution of these ratings in the two groups is shown in Table 7.

TABLE 7

Psychiatric Pathology Ratings

Rating	Final Status of Applicants: Rejected N	%	Accepted N	%
1 (High Pathology)	20	20	1	-
2	52	52	13	3
3	11	11	184	37
4 (Low Pathology)	8	8	257	52
Data Unavailable	10	10	35	7
TOTAL	101	101%	490	99%

Table 6

Comparison of Mean MMPI Scale Scores for Accepted and Rejected Applicant Groups

Means and Standard Deviations for MMPI Scales:

Status of Applicants		L[1]	F[1]	K[1]	Hs 1	D 2	Hy 3	Pd 4	Mf 5	Pa 6	Pt 7	Sc 8	Ma 9	Si 0
Accepted (N=490)	M	4.75	2.52	18.07	49.49	52.06	55.50	56.95	52.60	50.40	51.95	52.26	55.85	44.11
	S.D.	2.17	1.93	4.33	6.12	7.68	6.29	8.58	7.90	6.80	7.05	7.34	8.78	6.22
Rejected (N=101)	M	4.33	3.14	17.45	49.89	51.50	55.58	61.24	52.67	52.08	53.07	53.44	58.03	43.92
	S.D.	1.74	2.34	4.77	6.90	7.02	6.71	10.39	8.28	8.03	7.83	8.74	9.87	6.44
	t	1.81	2.83	1.29	.15	.68	.12	4.40	.08	2.19	1.43	1.42	2.22	.28
	sig. level	.05	.01	NS	NS	NS	NS	.01	NS	.02	NS	NS	.02	NS

Key: Scales - Defined

1 - Hypochondriasis
2 - Depression
3 - Hysteria
4 - Psychopathic Deviate
5 - Masculinity-Femininity
6 - Paranoia
7 - Psychasthenia
8 - Schizophrenia
9 - Mania
10 - Social Introversion

[1] L, F, K are validity scales used to correct for certain response sets; they are included here for the interest of the technical reader.

It can be seen that very few (less than 3%) of the applicants offered positions were considered to have shown significant levels of disturbance (i.e., ratings of 1 or 2). This contrasts sharply with the 70% of those not offered positions who received such a rating. Thus, the final decisions regarding appointment do clearly reflect the influence of the psychiatric screening judgments. There is, nevertheless, evidence of considerable independence of judgment being exercised by the civil service and police authorities, since some small portion of those candidates perceived as "disturbed" are appointed. Similarly, not all those rejected after successfully having negotiated all earlier hurdles in the screening process were rejected on the basis of the identification of psychiatric morbidity.

The psychiatric ratings were based largely on the interviewers' impressions. The examiners also had available to them the report of the psychological test findings as well as the full background dossier collected by detectives. The psychological test reports consisted of verbal statements describing the candidate's personality, potential problem areas, and suggestions regarding issues which might be explored further in the interview setting. These MMPI interpretations, it will be remembered, were made without access to any other information about the candidates. Pathology ratings on a similar 1 to 4 scale were also given by the MMPI interpreter. These numerical scores were not submitted as part of the test report and were not available to the psychiatric examiners but could be retrieved from files.

Table 8 shows the distribution of MMPI-based pathology ratings for the two groups. There is a somewhat higher (16%) proportion of applicants rated as significantly maladjusted on the basis of the MMPI (rating 1 or 2) who were subsequently offered appointments. Also a considerably lower proportion (34%) of those not appointed were identified as disturbed on the basis of the MMPI. And so it would appear that, while the interviewers did utilize the MMPI report, the psychiatric judgments again reflected considerable independence of judgment. It is quite likely that the interview and background material did not always support the MMPI findings. This is certainly to be expected since often the test reports noted possible or potential areas of disturbance and the MMPI pathology ratings generally reflected these potential maladjustment signs. The psychiatric interviewers were frequently able to rule out these potential problem areas and this fact is, therefore, more likely to be reflected in the interviewer's rating.

TABLE 8

MMPI Pathology Ratings

Rating	Final Status of Applicants: Rejected N	%	Accepted N	%
1 (High Pathology)	4	4	2	1
2	30	30	75	15
3	44	44	273	56
4 (Low Pathology)	23	23	140	29
TOTAL	101	101%	490	101%

The summary statements provided by the investigating detectives represented another source of direct information input available to psychiatric clinicians. These statements were subsequently coded into a 5-point scale reflecting a "favorable-neutral-unfavorable" continuum. Table 9 gives the distribution of these coded detectives' ratings for the two groups. Again, it would appear that very few (less than 1%) of those offered a position on the police force had received an unfavorable detective's evaluation. However, a sizeable percentage (49%) of those not appointed were favorably evaluated by the detectives. So, very few candidates unfavorably evaluated by the investigating detectives did receive appointments. But a favorable detective's evaluation certainly did not serve as a guarantee of a favorable appointment decision. Again it would appear that this form of information played some role in the ultimate judgments, but it was not a determining one.

TABLE 9

Detective's Evaluations of Applicants

	Final Status of Applicants:			
Rating	Rejected N	%	Accepted N	%
Strongly Favorable	18	18	259	53
Favorable	31	31	111	23
Neutral	20	20	82	17
Unfavorable	21	21	4	<1
Strongly Unfavorable	8	8	1	<1
Data Unavailable	3	3	33	7
TOTAL	101	101%	490	100%

THE DETERMINATION OF APPOINTMENTS

Because of the phased ordering of the decisions in the screening funnel, it is possible to go beyond mere description of such slippage between recommendations and the final decisions about appointment. The background investigations, MMPI testing, psychiatric screening, and final appointment are temporally phased in such a way as to establish a causal ordering among the variables, mapping information and recommendations associated with each of these points. The last phases in screening, as we also recognize, are extremely interdependent. The information collected and transmitted at each point is meant to be cumulative and redundant, so as better to screen out individuals who are manifestly or potentially pathological. It becomes interesting to examine these stages, in light of this interdependence, as a causal sequence, so as to determine the weight attached to each in the final disposition regarding each applicant.

Referring back to the diagrams in Figures 1 and 2, the reader will note that sequence of these last phases may be represented causally by the path diagram shown in Figure 3.

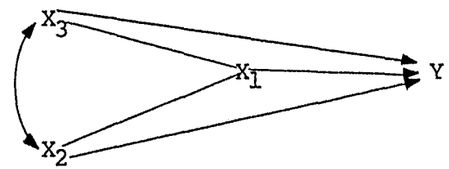


Figure 3. Causal Representation of the Dependence of Final Outcome Decisions (Y) on Psychiatric Ratings (X_1), MMPI Ratings (X_2) and Detectives' Ratings (X_3).

Such a recursive causal ordering may then be translated into a simple simultaneous equation system of the form:

$$Y = \alpha_1 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

$$X_1 = \alpha_2 + \beta_4 X_2 + \beta_5 X_3$$

Solving these two equations, we may then generate estimates, first of the linear dependence of Y (the final decision to appoint or reject candidates) on each of the three preceding stages, and, second, of X_1 (the psychiatric rating) on each of the two phases preceding it. Following the conventions of path analysis, the partial regression coefficients in these two equations will be transformed into Beta-weights, which serve as the "path coefficients" to be entered into our causal model. These weights may be interpreted as measures of direct net causal impact of the predictors in our model and may be examined for statistical significance by referring to their standard errors.

These two equations, estimated by ordinary least squares regression techniques, yielded the results reported in Figure 4.

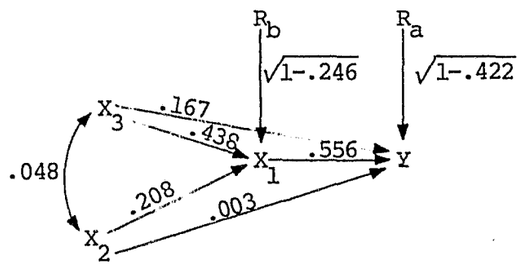


Figure 4. Path Coefficients for Causal Model of Selection

These figures are extremely interesting to us. First, as expected, the residual arrows leading into the two endogenous variables in the system, Y and X_1, tell us that there is not perfect determination either of the final outcome variable or of the psychiatrists' ratings. The R^2 for the first equation was .422, that for the second, .246. This may be attributed either to slippage between recommendations and subsequent decisions or to simple measurement error in our variables, but most likely to some combination of both these factors. Second, the path coefficients leading into Y are significantly large for X_1 and X_3 — each being much larger than twice its standard error, the rule of thumb for statistical significance in this case -- but negligible for X_2, the MMPI rating. By contrast, X_1 is significantly dependent on both X_2 and X_3. The statistic on the curved arrow connecting X_2 and X_3, which we have treated as predetermined in this model, is their zero-order correlation.

The absolute values of the R^2's and the coefficients are of less relevance to us than their relative values, since we are interested in the causal process and not in estimating true underlying parameters. What we have discovered is the strong relationship of psychiatric and detective ratings, their determination of the outcome, the weak dependences of psychiatric ratings on the interpretation of the MMPI, and the MMPI's failure to influence final decisions about appointment. The meaning of these findings is open to interpretation. The MMPI is, of course, a clinical instrument interpreted without benefit of personal interviews, and, as noted earlier, establishes guidelines for the psychiatric interview that indicate areas of potential pathology. What is surprising,

however, is that the relationship of psychiatric and MMPI ratings is not stronger than observed. While the psychiatric interview is indeed structured along lines suggested by the MMPI interpretation, the signals identified by the MMPI often do not manifest themselves in the applicant's interview, or in his personal history, or are not regarded by the psychiatrists as relevant to a projection of the candidate's qualifications as a police officer. The effects of identified pathology on the final appointment decision, though slight, are apparently absorbed in the path leading from X_1 to Y.

The latter interpretation, particularly, would seem to be supported by the apparent convergence between the ratings of the police detectives and the psychiatrists. Not only does the psychiatrist have to have the detectives' background reports when he interviews applicants -- and is thus directly influenced by information the detectives have gathered -- but also is apparently making a prediction about applicants based on roughly the same criteria used by the detectives. Thus, while the psychiatrists are apparently sensitive to manifestations of gross psychopathology, they are also making special judgments based rather more on the sorts of practical wisdom about police careers and the adaptability of applicants to organizations that are salient to the practical decision-maker. Does this candidate exhibit a history of maladjustment to organizational life? Has he had difficulties in school or in the military? Does he exhibit an erratic employment history? These are the considerations that produce concurrence between detectives and psychiatrists, and that yield an impact on the appointment decision. The greater weight of psychiatric ratings, relative to

detectives ratings, in these final decisions, is at least in part due to the greater authority attached to the psychiatrists' opinions in the final deliberations. In part the psychiatrists certify what the detectives discover; in part both merely look for the same signals of prospective organizational or occupational maladjustment. In addition, the psychiatric rating includes the direct effect of observed or incipient psychopathology. The contribution of the diagnosis of psychopathology to the outcome appears, however, to be small relative to the contribution of the signals of prospective career instability or work maladjustment.

Of course, if it were true that psychiatrists and detectives interpret the same personal facts in applicants' histories, then our causal model would be amenable to re-specification. In particular, we would be led to infer that the relationship between psychiatric and detective ratings was in part spurious, due to the common influence on each of background variables as yet unrepresented in our model. This very plausible possibility has caused us to enumerate, on the basis of discussions with the psychiatrists, a number of these salient features of applicants' personal histories, and to introduce them into an expanded model. Of the factors discussed, we were able to construct measures for the following influences: (1) stability of previous employment; (2) education; (3) personal adjustment to military service; (4) delinquent history; and (5) marital stability. These variables were constructed as follows:

X_4: <u>stability of previous employment</u> was indexed by constructing a variable measuring the average duration of all previous jobs.

X_5: education was measured by assigning a numerical value equivalent to the number of years spent in school and college.

X_6: personal adjustment to military service was indexed by creating a dummy variable based on whether the applicant received other than an honorable discharge.

X_7: delinquency history was measured by counting the number of serious juvenile offenses listed in the applicant's record.

X_8: marital stability was measured by creating a dummy variable based on whether the applicant had been divorced or separated (unmarried applicants were assigned the same value as married applicants).

The modified causal argument we have discussed requires us now to treat detective's ratings (X_3), along with X_1 and Y, as endogenous. Writing the background variables, along with the MMPI ratings, as predetermined, the new model become:

$$Y = \alpha_1 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$$

$$X_1 = \alpha_2 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$$

$$X_3 = \alpha_3 + \beta_2 X_2 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$$

It is to be noted that we have not dropped the insignificant path connecting X_2 and Y, and that we have also, for convenience, represented X_3 as dependent on X_2 as well. Though we do not expect these paths to be significant our decision was to fit initially the full recursive model.

The path diagram corresponding to this system of equations appears in Figure 5.

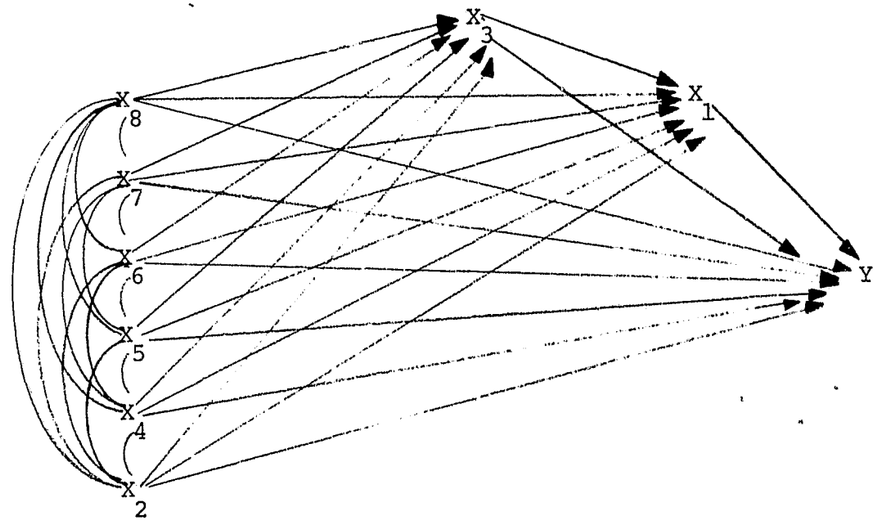


Figure 5. Path Diagram of Modified Causal Model, Incorporating Applicants Background Characteristics.

Since Figure 5 is too cumbersome to accommodate the results of the regressions, we present them in Table 10. (Table 11 contains the zero-order correlations among the pre-determined variables in the model.)

The first thing to note about these results is the values of the coefficients of multiple determination. Comparing these R^2 values with those obtained earlier, we note an improvement in our prediction of Y (final outcome) from .422 to .448, and an improvement in our prediction of X_1 from .246 to .289. These meager improvements in the degree of fit between our linear models and the data suggest immediately that we have most likely succeeded not in introducing independent sources of prediction into our equations but, as expected,

TABLE 10

Results of Regression Analysis for Modified Causal Model, Incorporating Applicants' Background Characteristics

Dependent Variables:	Partial Regressions Coefficients in Standard Form (Betas) for: X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	R^2
Y	.514* (.018)	-.016 (.018)	.156* (.013)	.047 (.004)	.065* (.016)	-.073* (.002)	-.134* (.019)	.090* (.056)	.448
X_1		.189* (.043)	.364* (.031)	.053 (.011)	.077* (.040)	.073* (.004)	-.177* (.048)	.104* (.138)	.289
X_3		.030 (.059)		-.055 (.014)	.104* (.055)	.103* (.006)	-.210* (.064)	.069* (.189)	.099

*t-statistic significant for β at or beyond .05 level. Values in parentheses are standard errors of the partial regression coefficients (unstandardized).

Y = final outcome; X_1 = Psychiatric ratings; X_2 = MMPI ratings; X_3 = Detectives' ratings; X_4 = Stability of previous employment; X_5 = Education; X_6 = Adjustment to military service; X_7 = Delinquency history; X_8 = Marital stability.

TABLE 11

Zero-Order Correlation Coefficients for Pre-Determined Variables

	X_2	X_4	X_5	X_6	X_7	X_8
X_2	x	.044	.001	-.108	-.158	-.026
X_4		x	-.177	-.497	.119	.115
X_5			x	.196	-.037	-.033
X_6				x	-.068	.187
X_7					x	-.071
X_8						x

in re-specifying the relationship between X_1 and X_3. But what we observe in comparing the Beta's for X_1 and X_3 in these equations with the Beta's in our earlier equations is only very slight attenuation. $\beta_{1Y.23...8} = .514$ compared to $\beta_{1Y.23} = .556$; $\beta_{3Y.124...8} = .156$ compared to $\beta_{3Y.12} = .167$; and $\beta_{31.24...8} = .364$ compared to $\beta_{31.2} = .438$. The direct relationships of X_1 and X_3 to Y are hardly modified, while there is a slight but significant attenuation in the dependence of X_1 on X_3. Thus, while the re-specification of the model does reveal some spuriousness in the association of detectives' ratings and psychiatric ratings, the direct impact of X_3 on X_1 remains very substantial.

The surviving impact of X_3 on X_1 appears, therefore, to be compatible with several overlapping interpretations. The psychiatrists appear to be functioning, with the background dossiers in hand, to certify and interpret information collected by the detectives, in addition to identifying rare instances of gross psychopathology. That they interpret the same information somewhat differently than the detectives and that their interpretations are regarded with more weight by those who make the final decisions would account both for the lack of perfect correlation of X_3 and X_1 and for the substantially larger direct path from X_1 to Y than from X_3 to Y. Partitioning the R^2 values to discover what fractions of the variance in X_1 and in X_3 are "explained" by the background variables reveals that $R^2_{1.45678} = .13167$ and $R^2_{3.45678} = .09891$. Thus, slightly more variance is explained, in absolute terms, in X_1 than in X_3 by these predictors, an observation which would also tend to support our interpretation.

We shall make no effort here either to interpret the specific slopes associated with these background variables or to rewrite the model deleting the insignificant paths. These are exercises best reserved to contexts in which theoretical interest attaches to these particular variables.

CONCLUSIONS

In this paper we have described the screening process operating in the Rochester (New York) Police Department. Basing our analysis on data retrieved from several record systems, we have succeeded in estimating the attrition associated with various points in screening, in comparing accepted and rejected applicants in terms of their MMPI profiles and their evaluation by psychiatrists and detectives, and in constructing a causal model of the final phases of the screening.

Our analysis is a first step toward a more thorough evaluation of the role of mental health screening in the selection of candidates for police work. The clinician will have been disappointed to discover in our results only very meager evidence of the direct impact of clinical interpretations on the decisions made either by psychiatrists or practical decision-makers. The MMPI apparently serves as a sensitizing screen in the Rochester funnel, pointing to areas of potential interest to the psychiatric interviewers. So too does the information collected by the police detectives. Each of these are essential sources of input for psychiatric judgments, based as they are on spare half-hour interviews with candidates. The weight attached by decision-makers to the psychiatric ratings is evidence

of the disposition of public officials to regard psychiatric certification as an essential authoritative criterion for eliminating applicants -- their reason for starting the screening to begin with -- and certainly not evidence of the uselessness of other types of clinical screening.

The funnel operates as a redundant, cumulative measurement instrument. The more stages it includes, the greater the attrition it is capable of producing. Variations in this attrition are the product of external influences operating to affect the demand for applicants by the police. Passing scores on tests are artificially manipulated and standards of fitness or qualification changed as the supply of potential personnel exceeds or fails to meet manpower requirements. In practical terms, there are no exact, perfect standards for police recruitment; a grey area intervenes between the unquestionably qualified and the unquestionably unqualified applicant. This is true as much of mental health criteria as it is of height or weight. The task remains to determine more exactly what the irreducible parameters of such judgments should be. The fact of slippage between recommendations and appointment permits some approximation of the risks incurred by changing standards or disregarding the recommendations, since some men are appointed as policemen who have been clinically pinpointed as potentially disturbed. These, however, are directions for future research.

END

7 illustrations