PSYCHOBIOLOGICAL SCREENING PROCEDURES IN THE WAR SHIPPING ADMINISTRATION*

BY GEORGE G. KILLINGER† AND JOSEPH ZUBIN‡

The War Shipping Administration was created, soon after Pearl Harbor, by Executive Order, as a temporary war-agency to control and operate American merchant ships. Approximately 90 per cent. of all military and essential cargo moved during the war in American vessels has been under the control of the War Shipping Administration, the remainder being controlled by the Army and Navy. In carrying out the responsibility entrusted to it, the War Shipping Administration had to cope with the problems of obtaining the necessary ships, manning them, planning cargoes, and signing on merchant seamen for voyages and signing them off at the completion of each trip. Of the many tasks which the War Shipping Administration had to face, the one that we are primarily concerned with was that of securing men to man the ships.

It should be realized that the American Merchant Marine is essentially a civilian organization, which, at the beginning of the war, consisted of some 55,000 experienced seamen in active service, plus a considerable number on the inactive list but, temporarily, out of the industry and in other employment, yet who, nevertheless, were potentially available to the industry. With the development of the war, the manpower needs of the industry have jumped to approximately 250,000 men needed for active service. The task of recruiting enough personnel to man an industry whose manpower requirements increased fivefold, presented selection problems of a psychological, medical, and vocational nature, which could not be met by the peace-time organization of the industry.

In order to cope with the problem of training new men and bringing back former seamen who had left the industry during peace-time, two separate divisions were created: (1) The Recruiting and Manning Organization, established to recruit experienced personnel; and (2) The Training Organization, to recruit and train inexperienced personnel.

Both of these organizations were faced with the necessity of obtaining psychological, psychiatric, and medical services for active seamen, as well as for the newcomers to this industry.

† U. S. Public Health Service Reserve, Chief, Psychobiological Activities, WSA.
‡ U. S. Public Health Service Reserve, Chief Medical Statistician, Psychobiological Program.
In order to meet this need for a specialized war-time medical service, advantage was taken of the Federal statutes, dating back to 1798, which authorized the U. S. Public Health Service to provide medical care for American Merchant Seamen. Through all these years, the U. S. Public Health Service has continued to furnish medical care to Merchant Seamen through the operation of Marine Hospitals and Relief Stations. However, this service had neither been greatly concerned with a mandatory, pre-employment examination for each voyage, nor with the treatment of seamen suffering from war—and other types of neuroses. With the greatly expanded organization, existing facilities proved inadequate, in these particular respects at least. In order to meet the new needs, an "Office of the Medical Director" was created in the War Shipping Administration, to be filled by a commissioned officer of the Public Health Service. Later, the President of the United States recognized the significance of this work by promulgating an Executive Order which advanced the rank of this post to Assistant Surgeon General of the U. S. Public Health Service. Dr. Justin K. Fuller, who had served as Medical Director of the War Shipping Administration since the creation of that office in September 1942, continued in the new office. The medical staff of the War Shipping Administration is composed of four types of personnel: (1) Commissioned Officers of the U. S. Public Health Service, all of whom are detailed to the Navy Department and assigned to the War Shipping Administration; (2) Commissioned Medical Officers of the U. S. Navy; (3) technical personnel in commissioned and non-commissioned ratings in the Maritime Service; and (4) U. S. Civil Service Personnel.

The Psychobiological Service is one of the special professional services of the Medical Division of the War Shipping Administration, and was so named because it was desired to bracket under one heading that part of the medical program which dealt with clinical psychology and clinical psychiatry, in which the psychiatrist and psychologist work as a closely coordinated team.

This Service has the four-fold purpose of screening out the unfit, providing short-term therapeutic treatment for the mildly maladjusted who offer good prognosis, teaching normal psychology and methods of adjustment to the general body of trainees and seamen, and giving general psychological and psychiatric counselling to individual normal seamen, in order to equip them to meet the exigencies of sea duty during wartime.
In addition to the psychological and psychiatric activities within the Psychobiological Service, the War Shipping Administration, through Sr. Surgeon (R) Daniel Blain, the Medical Director for the Recruiting and Manning Organization, who also serves as Medical Director for the United Seamen's Service, carries on an intensive psychiatric program in the selection and treatment of seamen who show evidence of occupational stress, such as convoy fatigue, war neurosis, and other pathological symptoms. The psychiatrists of this Service work very closely with the Psychobiological Service and serve as psychiatric consultants to the Medical Examination Program for seamen. This Organization has established, on the East, Gulf, and West Coasts, informal, non-institutional types of rural residence-units called Rest Centers, each under the direction of a psychiatrist. These Centers provide care for all seamen requiring a brief therapeutic regime of rest and recuperation. As Dr. Blain has so well pointed out, the aims of this brief therapeutic program are to build the seamen up, eliminate their symptoms, give them psychological security and prophylaxis against the hazards of subsequent voyages, and send them back to sea.

This paper is devoted to the description of only one part of the psychobiological program: that of screening. We shall deal, first, with the Training Organization. The Training Organization absorbed all the previously existing government training facilities for service in the Merchant Marine and expanded them. The present facilities consist of the U. S. Maritime Service and the U. S. Merchant Marine Cadet Corps. The Training Organization also extends supervision to the State Maritime Academies located in California, Maine, Massachusetts, New York, and Pennsylvania. The U. S. Maritime Service is the largest Unit of the present Training Organization, and it was with this Unit that the Psychobiological Activities were first developed and have been used most extensively. The Maritime Service operates: (1) Enrolling Offices, located in the major cities throughout the United States, whose purpose is to recruit applicants for apprentice training; (2) Training Stations for apprentice seamen, located at Sheepshead Bay, Brooklyn, New York; St. Petersburg, Florida; and Avalon, Catalina Island, California; (3) Training Stations for Officer Candidates who are experienced seamen, located at Fort Trumbull, New London, Conn., and at Alameda, California; (4) Upgrade Schools, in the larger seaports, for further training of cooks and bakers, able-bodied seamen, and officers; (5) Radio Schools, at Gallups Island, Boston Harbor; and Hoffman Island, New York Harbor; (6) Purser-Hospital Corps School;
(7) Turbo-Electric Schools and other schools for specialized training; (8) Training Ships, of which there are ten of major size, that are utilized in connection with the various training programs to give practical experience to the trainees. In addition, the Training Organization operates three basic schools for the training of cadet midshipmen: at Pass Christian, Mississippi; San Mateo, California; and King’s Point, New York. It also operates the Merchant Marine Academy at King’s Point, New York.

The screening program was inaugurated at the three Training Stations which devote the major part of their time to the preliminary training of apprentice seamen, and extensive screening procedures were established at each. It was soon found that preliminary screening of the obviously unfit was required at the source of enrollment (the Enrolling Office), in order to avoid needless expenditure in transporting the patently unfit from their homes to the Training Stations, only to be disenrolled and sent home immediately upon arrival. Such screening had already been instituted, at the Enrolling Offices, for physical defects, but the psychologically untrained personnel in charge of these enrolling offices could not readily detect the emotionally unfit. To meet this situation, two personality questionnaires were prepared; one for enrollee candidates under age 18, and another for candidates 18 years of age and older. Both of these questionnaires were based on questions selected from the more elaborate Personal Inventories used at the Training Stations, and from certain social history data, such as record of incarceration, 4-F classification by draft boards, and previous service in an armed force; all of which had been found significant in elimination of persons incapable of surviving Training Station routine and subsequent adjustment to sea-life.

Visits were made to each Enrolling Office in the major cities throughout the United States, and medical officers and pharmacist’s mates were instructed in simple screening techniques. The screening at Enrolling Offices must necessarily be at a simple level, since the personnel consists, very often, of either pharmacist’s mates or Medical Officers without much psychological or psychiatric training. Following the inauguration of these questionnaires at the Enrolling Offices, rejections at these offices perforce increased and rejections at the Training Stations dropped, with a net result that there was introduced into the training group a generally higher type of individual.

The Training Station screening procedure is as follows: The trainees who survive the screening at the Enrolling Offices, immediately upon
arrival at the Training Station and before receiving their physical examination, are assembled in large groups, and are asked to complete a Personal Inventory of the forced-choice type of some 80 items. This is supplemented by a short personal history sheet consisting of some 30 items built around family history, educational history, occupational history, and a self-evaluation by the trainee of his present state of health, together with a listing of any previous illnesses, injuries, or operations. The enrollee is also asked to state why he enrolled in the Maritime Service, in an attempt to gain insight into his motivation for entering the Service.

The trainees are introduced to these questionnaires by the statement that this is the beginning of their medical examination, and that, were sufficient personnel available, each trainee would be individually interviewed. Since this is impossible, they are asked to cooperate by filling in these forms as carefully as possible. In this way, rapport is established, and sufficient motivation aroused for careful completion of the forms.

As a result of some preliminary experiments at the Station, it has been found desirable to select for personal interview all trainees who make a score of 20 or more on the test; that is, those who give 20 or more abnormal answers out of the 80 items presented. In addition, several items have been selected from the Inventory which are themselves sufficiently indicative of probable maladjustment. These are items dealing with headaches, fainting spells, head injuries, dizziness, enuresis, arrests and imprisonments, a visit to a doctor or hospital for nervousness or convulsions. These are termed "stop" items, and a trainee who gives a deviant response to even one of these "stop" items is called in for personal interview, regardless of his total score. The personal background data are also scanned for possible implications of mental deviation. The following items in the personal history are considered sufficiently indicative to warrant a personal interview: discharge from military service (in the present war and prior to the termination of the war); arrests or imprisonments; history of mental illness, head injury, sleepwalking, and educational retardation.

The scores are computed immediately after the questionnaires are administered, and the results are used in selecting candidates for interview by the psychobiological team stationed on the main examination line. The men so selected are given a short interview by the psychologist or psychiatrist to determine whether they are grossly abnormal, mildly abnormal, or essentially normal, but had been accidentally caught
in the screening net, i.e., the "false positives." These initial interviews usually last approximately 4 minutes. The grossly abnormal are placed on immediate recall by the Psychobiological Unit, which studies the case quite intensively, utilizing for this purpose the psychometric scores supplied by the Classification Division, neurological findings made by the psychiatrist of the Psychobiological Unit, physical findings supplied by the Medical Department, and other psychological tests of a clinical nature administered by the psychologists of the Psychobiological Unit. The mildly deviant individuals who show some mental deviation, but who do not give convincing evidence of being unable to succeed in training and sea duty, are asked to return for follow-up therapy within a week after beginning training. These men are followed for several weeks and, in some cases, eventually make an adjustment. In other cases, they are subsequently disenrolled. The "false positives," along with the normals, enter training immediately and receive only the routine group mental hygiene.

At the inception of the program, an attempt was made to find the most suitable Personality Inventory for screening purposes. After intensive research and experimental tryouts, the Personal Inventory, Form B, prepared by the National Defense Research Council, was selected because it had been validated on men in the military forces, and because of its forced-choice type of item which was believed to be more suitable than a more direct form of question for eliciting accurate information. After a preliminary trial of this Inventory on some 10,000 cases, it was found that the instrument was too unwieldy for our purposes. There were too many items that did not differentiate between successful and unsuccessful trainees. Some of the words used in the items were too difficult, and it was not especially suited for selection of men for the maritime industry. In order to circumvent these difficulties, an item analysis of the results on a sample of some 1400 men was made, and a thorough analysis by age groups as well as by cause of disenrollment indicated that some 100 items out of the 145 included in the Inventory proved to be diagnostic of failure at the Training Stations. It should be pointed out that some of the items which were found to be diagnostic had not been used diagnostically by the N. D. R. C. Inventory, but had been introduced merely as psychological ballast for the questionnaire. On the basis of the results of this item analysis, a new Inventory was drawn up which included 26 items taken directly from the N. D. R. C. Inventory, 21 modified items and, 33 new items, covering special Maritime situations, such as fear of water, high places, jump-
ing and climbing, and the general area of patriotism and motivation for joining the industry. It is well to recall, at this point, the essentially civilian character of the Maritime Service. Because the trainees are civilians who can come and go practically at will, the responses of these men to the questionnaire do not suffer to the same degree from the handicaps that might arise in the Military Service where a greater tendency may exist to put one's "best" or "worst" foot forward. Furthermore, because of their civilian freedom, it is important to select only men who are emotionally suited for the particular hazards that beset the seamen, especially in time of war, since there is no way of forcing these men to continue in the Service, if they find themselves unsuited for it. Whatever excellence the screening program achieves redounds, not only to the eventual welfare of the men themselves, but also to the eventual efficiency of the industry.

We may now turn to the description of the actual results of the screening procedure. As evidence of its efficiency, we summarize as follows: Out of every 100 men, 66 present evidence of being sufficiently emotionally stable not to require any further screening than is afforded by the written Inventory and Personal Data Sheet. The remaining 34 require, at least, a brief screening interview, because their Inventory and Personal Data Sheets indicate that they have either given more than 20 deviant responses, have given one or more deviant "stop" responses, or have given an indication in their personal history of some condition which requires further investigation. Of these 34 interviewees, only about 1 or 2 are found to possess personality defects making it mandatory that they be immediately excluded from training. Some 6 or 7 are found to have temporary, or mild, emotional conditions, which, after a short stay at the Station under the guidance of the Psychobiological Unit, become sufficiently ameliorated to permit them to continue training. The remainder are individuals who have either misunderstood some of the questions, or have unintentionally given indications of conditions which, if they actually existed, would disqualify them. Thus, within one or two days after the arrival of the group, the vast majority of the misfits have been disenrolled, while those requiring therapy are given their follow-up appointment schedules. In the course of the first month of their stay, a few more individuals are found to have conditions or defects which require their elimination from the Station. Among these are included a small group of individuals who misrepresented themselves either intentionally or unintentionally in their responses to the written part of the screening procedure. These are the
enuretics, somnambulists, epileptics, and others who refrain from indicating their true condition for one reason or another. In addition, there may be several individuals who develop severe emotional disturbances and even psychotic episodes after their admission to the Station. These, of course, could not have been detected on admission, since the disqualifying condition was probably not present, or in remission, at the time.

Summarizing the efficiency of the screening procedure, it might be indicated that it successfully screens out fully 85 per cent. of those who eventually must be disenrolled. Some 12 per cent. who are eventually disenrolled escape the initial screening net through misrepresentation, while 2 or 3 per cent. develop personality disturbances, after their admission, of sufficient magnitude to require their disenrollment. It is hoped, eventually, to reduce the number of individuals who get by the screening procedure through misrepresentation, by utilizing various approaches to pattern analysis of the item responses.

It should be noted, at this point, that even those who are disenrolled are not summarily dismissed, but are given a careful exit interview which aims to prepare them, emotionally and vocationally, for finding a better outlet for their patriotic motives.

Screening does not stop at the Enrolling Office or the Training Station, but continues throughout the active career of the seaman. A special Wartime Order requires that each seaman receive a sign-on examination before each voyage to determine whether he is mentally and physically capable of making the trip. As part of this examination, a special psychobiological screening technique has been introduced. The screening questionnaire used consists of some 20 questions and deals chiefly with traumatic episodes such as torpedoings and air raids, as well as hospitalization overseas, treatment at Rest Centers, and special problems which may have developed for the seaman, since leaving the Training Stations and while employed in the Merchant Marine. Upon completion of these questionnaires, the seamen are interviewed very, briefly by a psychologist on the Sign-On Examination line, and those who are found to be grossly unstable are given intensive psychological and psychiatric study, in order to make the best possible disposition of their cases. Since August 1944, 41,000 Sign-On screenings have been conducted at the New York Port alone, and from these interviews it is hoped that we can eventually determine the various personality patterns of successful seamen, and, on the basis of these find-
ings, reorient our selection program so as to obtain for the industry the most suitable and most effective types of personality.

About the eventual picture of the successful seaman that may emerge, we can now only hazard a guess, but sufficient clinical evidence has already been accumulated to indicate that the negative traits, traditionally attributed to peace-time merchant seamen, do not hold true for the present, war-time cross-section of the industry. On the whole, the merchant mariners of the moment are capable, industrious men, who compare favorably with any other industrial group doing work requiring the same degree of capacity and skill.

**DISCUSSION OF THE PAPERS**

Dr. Rosé G. Anderson (*Psychological Service Center, New York*): I should like to preface any comment on these significant papers by indicating my position with respect to the use and interpretation of personality inventories.

Such personality tests have three functions: (1) screening; (2) guiding the clinical interview by high-lighting areas needing further investigation, or eliminating certain areas from further consideration; and (3) providing supplementary material in arriving at clinical judgments. Such tests are never a substitute for the individual interview nor for clinical judgment.

For one reason, the items as rated cannot be accepted as objective fact, but must be evaluated in terms of the determinants of each individual’s response. The response may be one of complete naiveté, i.e., uncritical marking of the items because of lack of appreciation of their implications. It may be that of the conscious malingerer who, especially in military service, has a motive for presenting himself as unqualified for specific responsibilities. In other cases, especially in connection with employment, the conscious motive to answer in the supposed favorable direction influences the rating of the items and distorts the picture in various ways.

Further, we have that considerable proportion of individuals who lack self-insight in varying degrees, whose ratings are weighted according to the direction and degree of their errors of self-estimate.

The optimum value of the personality inventory results from its use as an adjunct to the interview, after rapport has been established with a consultant from whom the individual desires insight and guidance, and in whom he feels sufficient confidence to reveal himself unreservedly.

In view of this position, I raise the question whether any personality test should attempt to diagnose the wide range of mental deviations included in the Minnesota Multiphasic test. It seems comparable to the common lay concept of aptitude testing. We frequently have individuals requesting an aptitude test. We explain that identification of aptitudes involves a range of aptitude tests. Also, that the selection of the appropriate tests for any specific individual depends upon information about his experience, training, etc.

To attempt to diagnose many mental deviations by one measure seems analogous to attempting to measure many aptitudes by one test, with the exception that, in the latter case, we are looking for positive evidence, rather than negative.

In the Minnesota Multiphasic Inventory, much irrelevant material is included for any specific case. This is apparent from inspection and from the mutually exclusive diagnostic categories. However, I should like Major Abramson’s comment on whether he has not found the test more useful in guiding and short-cutting the interview than in diagnosis. It would appear from his data that an appreciable number of items could be eliminated from the scale, since the distinctive pattern of the individual profile persisted in the limited number of items answered consistently in the repetition of the test.
According to the reports in the literature, there are a number of high positive correlations between diagnostic categories, e.g., as high as +.55 between hysteria and depression in normal subjects, and as high as +.71 between hysteria and hypochondriasis in hospital patients. The evidence points to the possibility of both shortening the scales and differentiating the categories, by eliminating less discriminatory items.

This would seem especially desirable when the scale is used for screening. That a shorter number of critical items results in satisfactory screening is demonstrated by Dr. Killinger’s report.

Mr. Arthur E. Traxler (Educational Records Bureau, New York): My comments represent the viewpoint of one interested in the guidance of normal young people. My main interest is in those aspects of personality which can be stated in the every-day terminology of teachers, counselors, and school psychologists. As is true of many other persons in this field, I tend to take a conservative view of the value of personality testing, as far as the application of these techniques outside clinical situations is concerned. In the first place, we have the perennial question concerning whether or not there are generalized personality traits and whether by means of personality tests we can sample anything that is stable under varying conditions.

Even if certain aspects of personality are stable, we still find personality tests of rather limited value, because all our measuring techniques in this field are more or less experimental. Projective techniques are so nebulous, and the interpretations are so involved and technical, that their successful use seems to be beyond anyone except the expert. The basic method of most non-projective techniques (open to all the well-known limitations of the questionnaire method) may be helpful to a clinician, while of much less value in other hands.

It is obvious, of course, that the term, “non-projective,” covers a wide variety of specific techniques, some of which have little in common. It includes instruments the purposes of which are well disguised, those whose purposes are partially disguised, and those whose purposes are not hidden at all from a moderately intelligent subject. In general, the attempts to measure personality by means of non-projective techniques whose purposes are not apparent to the subject have not been fruitful. So, during the last fifteen years, the majority of those constructing personality tests have based their techniques upon the self-inventory, or psycho-neurotic questionnaire, in which the individual is required to respond with “yes,” “no,” or “doubtful,” to a series of questions concerning how he acts or feels in a variety of situations. Some of these questions have undoubtedly been subjected to very careful scrutiny, for they were first used by Woodworth, about 1920, and the same questions have appeared in many different inventories since that date.

The application of the multiple-scoring technique has greatly increased the kinds of information one can obtain through the administration of a single series of questions to a subject. Many different scales have been set up and standardized on the basis of this type of atomistic approach to the study of personality, and some of these tests have been developed through admirable procedures of test construction. Nevertheless, the validity of all these measures is almost wholly dependent upon rapport; upon the honesty and fairness of the individual taking the test; and his ability to appraise accurately his own reactions and feelings.

The Minnesota Multiphasic Personality Inventory is one of the newest of the personality questionnaires set up and standardized for clinical use. The first published data on the inventory appeared in the literature less than five years ago, and work on it is still being done. A considerable number of the questions in this inventory have appeared in other tests, but it includes more questions and a wider variety of questions than most of the other personality tests. The original technique of individual administration through the use of cards may be an improvement over the usual procedure, when the subjects are clinical cases. A group booklet has recently been prepared, and the test has been adapted for machine-scoring.

Esthay and McKinley have published four articles on the inventory. The first outlined the general nature of the measurement project in which they were engaged, and the other three described the development, respectively, of the scales
for hypochondriasis, symptomatic depression, and psychasthenia. As far as I can
tell from careful reading of the articles, the procedures they used involved good,
defensible techniques of test construction. The main weakness seemed to be in
the small size of the criterion group: fifty for each of the first two scales, and
only twenty for the third one. The cases with which the groups were chosen
probably makes the small size of the groups less of a limitation than it would
otherwise be.

Hathaway and McKinley's description of the procedure employed in choosing
the criterion groups seems to imply that there is a dichotomy between normal and
abnormal subjects with respect to such a concept as psychasthenia. I would be
inclined to question that assumption, if it is actually made by them. The distri-
bution of individuals with regard to any of these aspects of personality is, I be-
lieve, a continuum. Their criterion cases were not different in kind from the nor-
mal subjects. They simply represented extreme deviations from the mean of the
normal population, even though they were clinical cases.

Six additional scales for the inventory have been published, although, apparently,
detailed information on the procedures used in constructing these scales has not
been made available.

One of the points made by Major Abramson was that the shape of the profile of
scores on the Minnesota Multiphasic Personality Inventory is more important
than the actual value of the scores. I think that this statement could be extended
to include all personality inventories yielding multiple scores.

There was an impressive amount of agreement between the profiles obtained
from several of Major Abramson's cases before and after the administration of
alcohol. In view of the reliability coefficients elsewhere reported, it appears that
the agreement is as close as one would expect to obtain from two administrations
of the multiphasic test to the same individuals, without the use of alcohol in the
interim.

Major Abramson stated that the multiphasic test provides an excellent shortcut
to obtain a psychosomatic history. This is, I believe, one of the chief values of
personality inventories in general.

Dr. Killinger made the statement that, in the first personality inventory devised
for screening procedures in the War Shipping Administration, the wording of some
of the items was too difficult, and that it was found advisable to revise the inven-
tory. The wording of all personality inventories probably needs careful study.
Some of these inventories may tend to be disguised intelligence tests for certain
individuals.

I would like to enter a plea for more research on specific measurement devices
of the type represented in these papers. One is constantly amazed by the exten-
sive use of hundreds of measuring devices, mental, achievement, aptitude, interest,
personality, which have been the subject of almost no research except that carried
on by the authors at the time they constructed the tests. By and large, these in-
struments are taken on faith. The field is so nebulous, and the relationship be-
tween personality-measuring devices and their avowed purposes is so subtle, that
one cannot validate these instruments by a common-sense process of inspection.
It is necessary to study the scores in relation to expert judgment, and long-time
case records, before the worth of the tests can be appraised.

Although the Minnesota Multiphasic Personality Inventory has thus far been a
clinical instrument, it is to be hoped that eventually its use may become some-
what broader, and that it will be feasible to recommend it for experimental use in
guidance situations in educational institutions. It is research such as that here re-
ported which will decide for us the worth of this instrument and other personality
inventories. It would be very helpful, for example, to have additional infor-
mation on the intercorrelation of the scales for the multiphasic test; data on the
intercorrelation of the scores on these scales with intelligence test results; and on other
measures.