

Minnesota Studies in Vocational Rehabilitation:

I. Research Plan and Bibliography

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PREFACE

The University of Minnesota's Industrial Relations Center *Bulletin 21* describes preliminary steps in a series of studies dealing with employment problems of vocationally handicapped persons. These studies, supported in large measure by the Office of Vocational Rehabilitation in the Department of Health, Education, and Welfare, are being conducted by members of the Center's staff in cooperation with faculty members from the Department of Psychology. Major responsibility for the direction of the entire project is held by Professor George W. England of the Industrial Relations Center and Professor Lloyd Lofquist of the Department of Psychology.

This bulletin is the preliminary report in what will presumably be a series based on these studies. It presents the general plan for this research, together with an annotated bibliography of reported studies in the general area of vocational rehabilitation and employment. Part I describes in some detail the general problem with which these studies deal and the priorities to be given to each of several methods of attack on these problems. Preliminary investigation discloses the fact that although a variety of placement procedures has been used in assisting the handicapped in finding employment, few reports indicate the comparative values and effectiveness of these programs. In the opinion of the research staff, an evaluation of relevant experience in these placement activities deserves top priority and will provide a useful foundation for and introduction to subsequent analysis.

At this time plans contemplate what is essentially an experimental study in which the effectiveness of the several placement procedures can be compared. At the same time staff members are designing a community survey of physically handicapped workers to determine the nature and magnitude of their employment problems. That survey will test means of identifying the employable handicapped and will note what are suspected as distinctive personal characteristics. Work histories will be analyzed to see whether they may help to sharpen perceptions of the unique employment problems faced by handicapped workers.

These studies of the employment problems of the handicapped represent a further expansion of the Industrial Relations Center's long interest in the distinctive employment problems of various special groups. Earlier studies have focussed attention on employment problems of older employees, and a current study is concerned with the distinctive problems of middle-aged and older women workers. Attention to the problems of handicapped men and women represents a natural expansion of an estab-

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lished interest on the part of our staff. Members of the staff hope that the present bulletin may attract the attention of students elsewhere who have similar interests and who may be able to contribute insights that will be of assistance in these studies. We hope also that the annotated bibliography may be helpful to those who are or intend to become active in research of this field.

DALE YODER

RESEARCH PLAN AND BIBLIOGRAPHY¹

This publication is the first in a contemplated series of reports on the progress of the Industrial Relations Center's program of vocational rehabilitation research. It is written in two sections: Part I outlines the program of research; Part II presents an annotated bibliography of vocational rehabilitation research relevant to the questions under study which, it is hoped, will be of use to research workers, students, and practitioners in vocational rehabilitation.

Part I. The Research Plan

Industrial Relations Center research reflects the public interest in full employment in a free society and in work teams which are satisfying and productive. Consequently, "every situation that interferes with the finding of suitable work or with enthusiastic, effective cooperation in work has been regarded as the kind of problem the Industrial Relations Center should study."² One such situation stems from problems associated with vocationally handicapping physical, mental, or emotional conditions.

It has been estimated that there are at least two million physically handicapped individuals³ in the United States today who are in need of vocational rehabilitation services to enable them to engage in remunerative employment. It has also been estimated that 250,000 of the individuals who become physically handicapped each year could benefit from vocational rehabilitation services which would permit them to enter or return to some gainful employment. These estimates⁴ refer to physically handicapped individuals who are unemployed or who are not in the labor force but could be gainfully employed. They do not

¹ The IRC vocational rehabilitation research program is supported, in part, by a research Special Project grant from the Office of Vocational Rehabilitation, Department of Health, Education, and Welfare. Appreciation for expert guidance in the project is extended to Professor Donald G. Paterson, Professor Dale Yoder, Professor Herbert G. Heneman, Jr., and Assistant Professor Thomas A. Mahoney.

² Nelson, Roberta J. (ed.) *The Ten-Year Story of IRC*. Minneapolis: University of Minnesota Press, 1955, p. 7.

³ The "physically handicapped" individual is defined in Public Law 565 (Vocational Rehabilitation Amendments of 1954) as "any individual who is under a physical or mental disability which constitutes a substantial handicap to employment, but which is of such a nature that vocational rehabilitation services may reasonably be expected to render him fit to engage in a remunerative occupation." (Sec. 11b) In the implementation of the law by public agencies, "physical or mental disability" has come to include emotional disabilities, that is, mental illness. In this publication series, "physically handicapped" will be used to refer collectively to the physically handicapped (such as orthopedics, amputees, cardiacs, tuberculosis patients, and the cerebral palsied), the mentally handicapped (mentally retarded), and the emotionally handicapped (those suffering from mental illness).

⁴ U. S. Department of Health, Education, and Welfare. *Annual Report, 1956*. Washington: U. S. Government Printing Office. p. 224.

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include those severely handicapped who are institutionalized, homebound, or who work primarily in sheltered workshops. Also excluded from these estimates are those individuals with physical, mental, or emotional disabilities which are not sufficiently handicapping to require vocational rehabilitation services, and who constitute some seven to eight million members of the labor force.⁵

There is little argument about the seriousness of the social, economic, and moral problems arising from the non-employment of physically handicapped individuals. To meet these problems, the Federal government has been cooperating with the states in an accelerated program of vocational rehabilitation aimed, for the present, at rehabilitating 200,000 physically handicapped individuals each year.⁶ "Rehabilitation" in the definition of the Federal-State program includes the placement of the rehabilitated individual in suitable employment.⁷ By this definition, rehabilitation is not complete if the rehabilitated individual does not find employment. And further, the rehabilitation process can be considered neither completed nor successful if the rehabilitated individual does not stay employed. The effectiveness of any program of vocational rehabilitation should be evaluated largely in terms of its success in helping the rehabilitated individual to find and maintain suitable employment.

Although gross data (such as that found in reports by public and private agencies) on the employment or non-employment of physically handicapped persons who have been rehabilitated is useful in the partial evaluation of a program of vocational rehabilitation, the more important issues are in terms of these persons themselves. Do they find suitable employment? And if they do, are they able to maintain it over a substantial period of time? Or, as it has been frequently observed, does being physically handicapped prevent these people from finding and holding suitable employment? What factors other than the handicap itself are responsible for non-employment of these persons? Perhaps the most important question is: how can the employment outlook for the physically handicapped individual be improved? It is to these problems concerning the employment of the physically handicapped that the Industrial Relations Center's program of vocational rehabilitation research is directed.

A limited aspect of the problems posed above was selected for intensive investigation as a starting point for the research program. The choice was based on the following rationale:

It is known that physically handicapped workers can compete successfully with non-handicapped workers, provided the handicapped workers are properly

⁵ National Industrial Conference Board, Inc. The company and the physically impaired worker. *Studies in Personnel Policy*. No. 163. New York: Author, 1957. p. 7. See also: Moore, M. E. and Sanders, B. S. Extent of total disability in the United States. *Social Security Bull.*, 1950 (Nov.), 7-14; Woolsey, T. D. Estimates of disability and illness prevalence in the United States. *Publ. Health Monogr.*, No. 4, 1952. An unused reserve of manpower. *Manpower Rev.*, 1943, 10, 3-4.

⁶ Office of Vocational Rehabilitation, Dept. of Health, Education, and Welfare in cooperation with The President's Committee on Employment of the Physically Handicapped. *Independence for the Handicapped*. Washington, D. C.: Author, 1955. See also: Progress and needs in vocational rehabilitation. *Monthly Labor Rev.*, 1955 (Sept.), 1019-1020.

⁷ Vocational Rehabilitation Amendments of 1954. Public Law 565, 48 Stat. 114, Sec. 11.

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trained and placed. This is true for a wide variety of jobs. Much is also known about "selective placement" or "differential selection and placement," i.e., the kinds of jobs that can be performed by a given handicapped worker and the groups of handicapped workers likely to be able to perform a given job.⁸ If, therefore, the physically handicapped worker experiences more than his share of difficulty in finding and holding jobs, it may be for reasons other than that he is unable to compete successfully with the non-handicapped, or because it is not known what job or jobs he can perform successfully.

One reason for this situation may be that job placement procedures currently in use with physically handicapped workers are inadequate or ineffective in terms of their application. In other words, current procedures may fail because we do not use what we know and not because we lack knowledge.⁹ Very little is known about the effectiveness of various job placement procedures as they are actually used. For this reason, the subject of effectiveness of job placement procedures used with the physically handicapped would appear to be in urgent need of study. It is, furthermore, a convenient starting point in a program of additive research.¹⁰ Research on this subject can lead in many directions: to the area of counseling and rehabilitation procedures; to the area of community and employer attitudes toward the physically handicapped; or to the area of psychological problems involved in being physically handicapped.

Two major projects are planned: a community survey of physically handicapped individuals; and an experimental study of the effectiveness of various job placement procedures used with physically handicapped counselees.

A. The community survey project

The survey is being designed with four specific objectives in view:

1. To determine the extent and magnitude of the employment problems of the physically handicapped population in the community, and how best to identify this population.
2. To determine the characteristics (such as age, sex, education, kind and extent of disability) of the physically handicapped population in the community.
3. To determine the employment status and other facts about the employ-

⁸ Stone, C. H. and Kendall, W. E. *Effective personnel selection techniques*. Englewood Cliffs, N. J.: Prentice Hall, 1956. See also: U. S. Department of Labor, United States Employment Service. *Selective placement for the handicapped*. Washington: Author, 1945; Wagner, T. *Selective job placement*. New York: National Conservation Bureau, Association of Casualty and Surety Executives, 1946; Bureau of Labor Statistics. *Work performance of physically impaired workers*. *Monthly Labor Rev.*, 1948 (Jan.); National Industrial Conference Board. *The company and the physically impaired worker*. *Studies in Personnel Policy*, No. 163, 1957.

⁹ Paterson, D. G. The conservation of human talent. *Amer. Psychologist*, 1957, 12, 134-144.

¹⁰ IRC research is characterized by an approach which is described, among other things, as "segmental and additive," i.e., it starts with a sharply defined problem and proceeds on a piece-by-piece, additive development of knowledge in the field. It builds on previous research by IRC investigators and by all other investigators as well. See: Nelson, Roberts J., op. cit.

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ment of the physically handicapped (such as kinds of jobs held, earnings, unemployment history, and job satisfaction).

4. To determine the extent to which age, education, handicap, vocational counseling, and rehabilitation training are associated with success in finding and holding jobs.

The survey includes two phases: an *identification* phase, which will involve a survey of households randomly selected from the community for the purpose of identifying and locating a sample of physically handicapped individuals, and a *follow-up* phase, which will involve an intensive study of these physically handicapped individuals to obtain information bearing on the above objectives.

Data-collecting instruments for use in the different phases of the survey are being developed. Two questionnaires are needed to obtain the desired information, one for each survey phase. The "identification" questionnaire will ask essentially, "Is there any member of your household who is physically handicapped?" The "follow-up" questionnaire is being designed to obtain personal history information, information on the individual's handicap and rehabilitation history, and information on the individual's employment status and history.

A series of sub-studies on methodological questions has been initiated in preparation for the community survey. These methodological studies require groups of known physically handicapped individuals on which to test the different survey techniques. These individuals are, for the most part, former counselees of the State Division of Vocational Rehabilitation and handicapped persons who have been placed by the State Employment Service.

One sub-study seeks to determine which of four questionnaires is most satisfactory for use in the "identification" phase of the survey. This sub-study consists of using the questionnaires in a telephone survey of households known to have members who are physically handicapped. (The problem of identifying the physically handicapped population in the community survey involves two separate problems. One is the problem of definition, of defining who the "physically handicapped" are. The other problem is operational, that is, the problem of developing the survey procedures which would best implement the definition. Both problems are being investigated in the sub-study just described.)

A second sub-study presently under way is designed to explore the efficiency of telephone interviews, mailed questionnaires, and personal interviews in the identification and location of physically handicapped individuals in the community. (The telephone interview and the mail questionnaire methods are under consideration as alternatives to the personal interview method. It is estimated¹¹ that physically handicapped individuals are found in one of every five households, which means that 2,500 households must be surveyed to locate a target sample of 500 physically handicapped persons. It is obvious that personal interview techniques would be quite expensive in the location of this sample.) This sub-study consists essentially of employing the three methods

¹¹ See: Moore and Sanders, *loc. cit.*, and Woolsey, *loc. cit.*

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in a survey of households known to have members who are physically handicapped.

A third sub-study involves the comparison of a mail questionnaire method with a personal interview method in a "follow-up" of a group of known physically handicapped individuals. The telephone interview method cannot be considered here because of the large amount of information which must be obtained. Data from this third sub-study will also be used for two other purposes: to provide preliminary insights into the effectiveness of job placement procedures used with the physically handicapped individuals served by the two state agencies, and to determine how successfully these individuals have been placed in terms of their employment histories since contact with the state agencies.

B. The experimental study

This study will be carried out in cooperation with the State Division of Vocational Rehabilitation and the State Employment Service. It involves the referral, over a one-year period, of all completed counseling cases of the Division of Vocational Rehabilitation to the Employment Service for placement. The referred counselees will be divided into experimental and control groups. Counselees in the control group will be referred and placed in the usual manner. In addition to the usual procedures, special experimental procedures will be used in the referral and placement of counselees in the experimental groups. Data will be collected on the effectiveness of the various procedures, both experimental and control, six months after initial placement.

Work is progressing on the development of the special experimental procedures. Referral techniques are being developed on the basis of a survey of vocational rehabilitation counselors and placement interviewers. The survey sought to determine the kinds of information which would be most useful in referring physically handicapped individuals for job placement, and the form in which such information should be expressed. Results of this survey are being published separately.

To summarize briefly, two major projects are in progress and will be reported in this series of publications. One major project is an experimental study of the effectiveness of job placement procedures. The other major study surveys the employment problems of the handicapped on a community-wide basis. The results obtained in these two major projects will determine, to a significant extent, the direction which the Industrial Relations Center's program of vocational rehabilitation research will take in the future.

Part II. An Annotated Bibliography of Evaluation Studies on the Physically Handicapped

As a background for the present research program, past research on the employment of the physically handicapped was reviewed. A large proportion of this research consisted of studies evaluating total programs of vocational rehabilitation or rehabilitation procedures and techniques. The approach to evaluation generally has been in terms of the employment of rehabilitated individuals: the problems they meet in entering or returning to work; the employment they obtain; the suitability of their employment; their job performance; and satisfaction with their jobs.

Evaluation studies are important in assessing total programs of vocational rehabilitation and in determining the effectiveness of specific rehabilitation techniques, such as job placement procedures. The annotated bibliography is the by-product of a special concentration on evaluation studies.

The articles included in the bibliography were selected to illustrate what is available on evaluation in the literature. A majority of these are "follow-up" studies that present data on employment problems of physically handicapped individuals after their entry or return to the labor market. The bibliography includes studies on industrial experience with physically handicapped employees, on problems of vocational adjustment, and on the "before-and-after" evaluation of vocational rehabilitation programs.

Many of the studies selected for annotation illustrate the difficulties involved in the choice of evaluative criteria and in failing to provide for a control group.

The choice of evaluation criteria can very easily make the difference between reported success or failure of a program or procedure being evaluated. In other words, the "dice might be loaded" in favor of "success" or "failure" by the choice of criteria. For example, if employment were the criterion, results may be "good" for a program which emphasizes vocational training, and "poor" for a program which concentrates on personal adjustment. What the criterion should include further complicates the problem. Should employment include part-time jobs, or should it be restricted to full-time jobs? A program or procedure may be judged successful when part-time jobs are included and unsuccessful when only full-time jobs are considered.

Making provision for a control group presents an equally difficult problem. Proper evaluation requires the comparison of two groups: an experimental group, on which the program or procedure under evaluation is tested; and a control group, matched in every relevant way with the experimental group, except that the program or procedure being evaluated is not applied to it. It often seems difficult to justify the use of a control group in research involving people. This is probably even more difficult when the individuals involved are physically handicapped. This difficulty, however, does not absolve the re-

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searcher from adhering to rigorous research standards; he has to deal with the problem of controls.¹²

The difficulties posed by criteria and control group problems are apparent in the literature on evaluation studies in counseling. Tyler's *The work of the counselor*¹³ discusses these problems in more detail than is permitted here and illustrates the many difficulties involved with the experience derived from seventy studies in the counseling field. Brayfield presents five studies in his *Readings*¹⁴ which set a high standard in coping with these problems. The interested reader is referred to these authors, as well as to Williamson and Darley.¹⁵

The present bibliography contains annotations from sixty-one articles concerning physically handicapped individuals. Of these, four studies concerned blind individuals, two were on the cerebral palsied, two on deaf persons, four on the emotionally disturbed, four on heart patients, eleven on the mentally retarded, two on orthopedic patients, one on paraplegics, three on poliomyelitis patients, two on seizure patients, and three concerned persons with tuberculosis. Each of the remaining 23 studies involved more than one disability group.

These 61 articles were published between 1931 and 1958, 36 of them appearing between 1953 and 1957. They were found in journals in the fields of rehabilitation, medicine, and psychology, and in other kinds of publications. The largest number of reports were found in the *American Journal of Mental Deficiency*, the *Journal of the American Medical Association*, *Industrial Medicine*, and the *Personnel and Guidance Journal*.

Sample size varied from 31 to 30,000, the median being 208. About two-thirds of the studies reported samples larger than 100. One confusing practice, with regard to sample size, was that of reporting disability categories by number at the beginning of the report and then using percentages rather than numbers in referring to data about each disability group. An added difficulty was the ambiguity about the base figure to which a percentage referred.

The great variety in choice and definition of variables studied makes difficult the comparison of findings from different studies. Such variability and lack of comparability in data reporting limits the usefulness of existing reports and indicates the need for adequate research design and "know-how" in conducting research on these important problems.

The annotations which follow are grouped in two categories:

- (a) "follow-up" studies, which attempt to obtain information about the physically handicapped and their experiences after they complete a program of rehabilitation or training, or after discharge from an institution or graduation from a school; and
- (b) "survey" studies of employed physically handicapped workers on such

¹² See annotations 9, 19, 36, 51, 57, 58, and 59 for studies which use control groups.

¹³ Tyler, Leona E. *The work of the counselor*. New York: Appleton Century, 1953.

¹⁴ Brayfield, A. H. (ed.) *Readings in modern methods of counseling*. New York: Appleton Century, 1950.

¹⁵ Williamson, E. G. and Darley, J. G. *Student personnel work*. New York: McGraw-Hill, 1937.

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variables as job performance, productivity, absenteeism, accident rates, and insurance costs (in some cases comparing handicapped workers with non-handicapped workers.)

Within each group of studies, sub-groupings are made by disability area.

A. Follow-up Studies

On the blind:

1. Buell, Josephine. Rehabilitation status of former students: California School for the Blind. *New Outlook for the Blind*, 1955, 49, 169-173.

Eighty per cent of a group of blind former students were located in a follow-up. It was found that 68% of the males and 32% of the females were employed, about half in competitive jobs, and the rest in sheltered workshops.

2. Fitting, E. A. Rehabilitation status of former students: Michigan School for the Blind. *New Outlook for the Blind*, 1955, 49, 21-26.

A follow-up of 84 blind former students eight years after leaving school found 30% unemployed. Unemployment tended to extend over a long period of time. Of the total group, only a few obtained employment in competitive jobs.

On the emotionally disturbed:

3. Greenblatt, M., Wingate, Marie, & Solomon, H. C. Work adjustment five to ten years after bilateral prefrontal lobotomy: a follow-up study of 86 patients with chronic mental disease. *New England J. Med.*, 1954, 250, 856-860.

A follow-up five to ten years after lobotomy was performed revealed significant gains in the post-operational work adjustment of patients when compared to their pre-operational level. Thirty-five patients adjusted well enough to resume life in the community, 21 of them returning to the same type of work they had before illness. Comparison of results with an earlier study indicated maintenance of improvement over the years.

4. Kir-Stimon, W. A follow-up study of counseling with anxiety neurotics. *Personnel & Guidance J.*, 1955-56, 34, 474.

Fifty-four veterans, anxiety neurotics rehabilitated under Public Law 16, were followed up 4 to 10 years later. One was in the hospital, two were unemployed, and 51 were employed in competitive jobs (professional, semi-professional, sales, clerical, skilled) earning an average of \$80 a week. For these individuals, vocational adjustment seemed to be largely associated with personal adjustment.

5. & 6. Markowe, M., Tonge, M. L., & Barber, L. E. D. Psychiatric disability and employment: I. A survey of 222 registered disabled persons; II. A follow-up of 95 unemployed subjects. *Brit. J. prev. soc. Med.*, 1955, 9, 39-45; 46-47.

Two hundred twenty-two psychiatrically disturbed persons (as diagnosed by a psychiatrist) were interviewed and tested. Of these, 127 were employed, 95

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unemployed. Occupational maladjustment was found to be related more to disturbance of the personality than to type of mental disorder. Successful rehabilitation seemed to depend largely on whether the subject previously had a stable personality and a satisfactory work record.

A follow-up 12 months later of the 95 who were unemployed succeeded in locating 86 of them, 42 of whom were then found to be employed. Improvement in work record was most marked for those whose neurosis was of recent onset.

On the mentally retarded:

7. Abel, Theodora M. A study of a group of subnormal girls successfully adjusted in industry and the community. *Amer. J. ment. Defic.*, 1940-41, 45, 66-72.

Eighty-four girls (Otis I.Q.'s of 45 to 91) placed in industry by their school, were followed up over a period of 3½ years; 55% were found capable of successful and steady employment. Prospects for future employment were very good if the subnormal girl maintained employment for at least two years.

8. Bobroff, A. Economic adjustment of 121 adults, formerly students in classes for mental retardates. *Amer. J. ment. Defic.*, 1955-56, 60, 225-235.

Twelve years after leaving schools for mentally retarded children, only 7 of 121 former students were found unemployed. Most of the group held unskilled and semi-skilled jobs or, in the case of women, were housewives. About half of those employed had been with the same employer for seven consecutive years. Average hourly rate was \$2.08 for the men, \$1.42 for the women.

9. Collmann, R. D. & Newlyn, D. Employment success of mentally dull and intellectually normal ex-pupils in England. *Amer. J. ment. Defic.*, 1956-57, 61, 484-490.

A group of 200 mentally dull ex-pupils (I.Q. 70 to 89) and a group of 106 intellectually normal ex-pupils (I.Q. 90 to 109) were followed up to 2 to 3½ years after leaving school. About 89% of the dull group and 94% of the normal group were gainfully employed. Only 2½% of the dull group were unemployed for relatively long periods of time.

10. Delp, H. A. & Lorenz, Marcella. Follow-up of 84 public school special class pupils with I.Q.'s of below 50. *Amer. J. ment. Defic.*, 1953-54, 58, 175-182.

An interview follow-up of 84 "non-educable" children (I.Q.'s below 50) found 10 of them (all male) gainfully employed, two of these in full-time jobs, despite the fact that even partial self-support is considered beyond the abilities of this group.

11. Harold, E. C. Employment of patients discharged from the St. Louis State Training School. *Amer. J. ment. Defic.*, 1955-56, 60, 397-402.

A follow-up found 29 of 74 mentally retarded former patients working at competitive jobs; the rest were employed by non-profit organizations. Jobs held were generally unskilled or semi-skilled, and earnings were below the national

average for comparable employment. However, employers were generally satisfied. Hostile, aggressive behavior, frequently expressed by patients while under institutional care, was almost totally absent in the job situation.

12. Hegge, T. G. The occupational status of higher-grade mental defectives in the present emergency. A study of parolees from the Wayne County Training School at Northville, Michigan. *Amer. J. ment. Defic.*, 1944-45, 49, 86-98.

Of 88 boys and 35 girls with I.Q.'s between 50 and 75, paroled in 1941-42, 89% were found (in 1944) to be employed, in the armed services, or housewives; average weekly wage for the employed was \$38.20. There was no evidence of a relationship between I.Q. and wages.

13. McKeon, Rebecca M. Mentally retarded boys in war time. *Ment. Hyg.*, 1946, 30, 47-55.

A personal interview follow-up of former pupils of a center for mentally retarded found 54% in the armed forces and 36% employed. Seventeen boys working in defense industries averaged \$48 a week; the rest averaged \$28.50. One-fifth of the group had been employed continuously since leaving the center.

On orthopedic patients:

14. McCoy, Georgia F. & Rusk, H. A. An evaluation of rehabilitation. *Rehabilit. Monogr. I.* New York: The Inst. of Phys. Med. & Rehabilit., New York Univ.-Bellevue Med. Center, 1953.

A follow-up study of 280 rehabilitated, orthopedically handicapped persons found 22% employed, averaging \$53 a week. About 90% derived some benefit from rehabilitation, but only 50% were found to be making full use of their abilities.

On paraplegics:

15. Berns, S. H., Lowman, E. W., Rusk, H. A. & Covalt, D. A. Spinal cord injury rehabilitation costs and results and follow-up in 31 cases. *J. Amer. Med. Ass.*, 1957, 164, (14), 1551-1558.

Twenty-four of 31 patients (29 paraplegics, 2 quadraplegics) were unemployed and economically dependent at the start of rehabilitation. Follow-up after one year found 13 employed (averaging \$40 per week), 8 unemployed, and 10 in vocational training programs.

On seizure patients:

16. Otto, J. L. Vocational rehabilitation of epileptics in Texas. *Amer. J. Psychiat.*, 1948, 105, (1), 417-419.

None of 42 epileptics (25 of them with complications) were employed before being admitted to a rehabilitation program (control of seizures, counseling, placement). After one year, 17 of these were placed without training, 4 placed after training, 13 still continuing in the program, and 8 discharged as unsuitable for the program.

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On tuberculosis patients:

17. Agur, C. X. & Anderson, C. W. Post-hospital rehabilitation study of tuberculous patients. *Archiv. phys. Med.*, 1954, 35, 307-312.

A follow-up of 76 veterans with arrested pulmonary tuberculosis found 39 employed, 29 still in training, and 8 unemployed. In general, the group's educational, social, and economic status improved considerably after rehabilitation.

18. Longton, C. K., Wagner, R. D., & Meier, P. Rehabilitation of the tuberculous in Philadelphia. *Amer. Rev. Tuberculosis*, 1950, 62, 190-208.

A questionnaire was sent to 305 patients rehabilitated between 1939 and 1949. The 65% who replied indicated satisfactory vocational adjustment in terms of satisfactory jobs and income, use of skills acquired in rehabilitation, low relapse and unemployment rates. Average weekly income was \$35 for white males. Agency records showed only 16 patients were employed before rehabilitation, 288 after rehabilitation.

19. Warren, S. L. A comparative analysis of the post-discharge experiences of tuberculous patients, *Amer. Rev. Tuberculosis*, 1954, 69, 153-163.

A group of 79 rehabilitated patients was compared with 161 patients discharged at the same time but who did not undergo rehabilitation. After 5 years, 85% of the rehabilitated group were found to be employed, compared with 47% for the non-rehabilitated; 80% of the rehabilitated and only 44% of the non-rehabilitated were satisfied with their jobs; the rehabilitated group averaged \$52.50 per week, the non-rehabilitated group averaged \$44.20. Findings on a variety of physical, mental, vocational, and socio-economic status factors are also reported.

On several disability groups:

20. Anderson, R. N. Do they stay rehabilitated? *The Virginia Rehabilitator*, 1955, 12, 11.

A follow-up after three years of 1,289 "closed-rehabilitated" individuals found 85% of the group still employed, 5.7% unemployed, and 2.6% deceased; 6.5% were not located. Average weekly wage was \$36.03.

21. Bloustein, M. After high school, what? Job status of home instruction pupils four to seven years after graduation. *Except. Child.*, 1955, 21, 219-221.

Of 93 severely handicapped high school graduates responding to a questionnaire, 57% were employed and 38% were unemployed. Average hourly earnings were \$1.25. The unemployed group was less intelligent, more impaired, and had less training beyond the high school level than the employed group. Unemployment was highest among the poliomyelitis and cerebral palsy groups, lowest in the cardiac group.

22. Breul, F. R. Do they stay rehabilitated? Olympia, Wash.: State Division of Vocational Rehabilitation, 1954.

In a follow-up of 371 former clients (30-42 months after rehabilitation), 321 were located, 255 of whom were found employed and self-supporting. Only

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25 of the original 371 had been self-supporting before rehabilitation. Average weekly earnings were \$52. About half of those employed at the time of the study had held the same job since initial placement.

23. Carlsen, Anne H. Vocational and social adjustment of physically handicapped students. *Except. Child.*, 1957, 23, 364-368.

Thirty-six physically handicapped 8th and 12th grade graduates were followed up by questionnaire and interview. More unemployment was found among 8th grade graduates than among high school graduates. Employment possibilities were improved by intelligence, adequate training for a particular job, ability to ambulate, use of the hands, and ability to speak intelligently. Personal dissatisfaction increased with degree of confinement to the home.

24. Condon, Margaret E. Ten year survey of physically handicapped students at the City College of New York. *Personnel & Guidance J.*, 1957, 36, 268-271.

A questionnaire follow-up of 87 physically handicapped former students showed that almost 90% of the alumni and 55% of the drop-outs were employed. Only 15% mentioned their handicap as a major obstacle to finding employment.

25. Dawson, V. R. & Anderson, R. H. Placement of rehabilitated patients. *J. Amer. Med. Ass.*, 1955, 159 (6), 557-559.

Two hundred twenty-four disabled veterans with various handicaps (neurological, tuberculosis, psychiatric, paraplegic, poliomyelitic, medical, and orthopedic) were accepted for a rehabilitation program which included vocational counseling, training, and job placement. A follow-up three to five years after rehabilitation showed 134 of these veterans were gainfully employed (average yearly salary: \$2,279), 36 were hospitalized, 9 were in training, 2 were deceased, and 5 were unemployed. The rest could not be located.

26. Dickenson, F. G. Medical economics: Scottish experiments in social medicine. *J. Amer. Med. Ass.*, 1948, 138 (1), 450.

An experimental rehabilitation program was opened for disabled miners. Average length of rehabilitation was 50 to 80 days. The discharged patient was followed up two and six months after discharge. Results with 1,900 clients show that 63% were able to continue their former work, 50% were fit for alternative employment, 19% were fit for light work only, and only 1% were unfit for any kind of work after treatment. The results indicate the rehabilitative value of returning the patient to work for which he is fit as soon as possible.

27. Feintuch, A. Improving the employability attitudes of "difficult to place" persons. *Psychol. Monogr.*, 1955, 69, No. 7 (Whole No. 392).

The effectiveness of a sheltered workshop program in improving the "employability" of 52 "difficult to place" handicapped persons was evaluated by comparing employment data on each subject for one year periods before and after the program. Average length of employment and duration of a job were significantly longer after the program than before. Characteristics found to be

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associated with "employability" were: under 55 years of age; one or more dependents; "moderate" disability; employed for more than 20 days in the year before the start of the program; ability to "get along with people"; and on community relief for less than a year.

28. Foreign letters. England: Resettling the disabled. *J. Amer. Med. Ass.*, 1954, 156 (2), 1271.

A follow-up of 11,437 persons registered under the Disabled Persons (Employment) Act showed that 73.9% were satisfactorily placed, 5.5% were in unsuitable jobs, and 10.6% were unemployed. Ten per cent did not reply to the questionnaire.

29. Kessler, M. S. Job satisfaction of veterans rehabilitated under Public Law 16. *Personnel & Guidance J.*, 1954-55, 33, 78.

A questionnaire survey and interview follow-up of rehabilitated veterans showed that, of 17 variables investigated, only three—age, education, and length of course—were associated with job satisfaction. The satisfied group was 18 months older, had more education (none of dissatisfied group were college graduates), and had courses averaging 3 months longer.

30. Lerner, Ruth S. & Martin, Marion. What happens to the college student with a physical handicap? *Personnel & Guidance J.*, 1955, 34, 80-85.

Of 59 physically handicapped female students studied over a 10-year period, 33 graduated and entered their chosen occupation, 15 were still in school at the time the study ended, and 11 dropped out of school. The students who graduated took slightly longer than 4 years on the average to complete their college courses.

31. Lesser, Marion S. & Darling, R. C. Factors prognostic for vocational rehabilitation among the physically handicapped. *Archiv. phys. Med.*, 1953, 34, 73-81.

Five hundred thirty-one former clients of the Institute for the Crippled and Disabled were interviewed; 264 of these completed rehabilitation 10 years before, 267 two years before. More of the 10-year-rehabilitated group (71%) than the 2-year group (41%) were found employed. Poliomyelitis patients seemed to have the best prognosis for employment, followed by paraplegics, amputees, and the cerebral palsies, in that order. Severe disability tended to become less of a vocational handicap with time. Better vocational adjustment was found associated with onset of disability before the 30th birthday but after birth, ability to achieve physical independence, average or above average intelligence, and at least some high school education.

32. Lipton, B. H., Hoberman, M., & Teschner, B. Rehabilitation of the severely disabled. *J. Rehabil.*, 1955, 21, 8-10, 19.

More than 90% of 71 paraplegics and 32 tuberculosis patients were found employed three years after graduation from a watchmaking school. Average weekly earnings were \$67.61 for the paraplegics and \$71.64 for the tuberculosis patients.

33. Marquis, Dorothy P., Hovis, F. W., & Wesley, S. M. The role of psychology in a rehabilitation program. *Psychol. Bull.*, 1943, 40, 687-691.

Psychological services constituted part of the rehabilitation of 222 clients with varying disabilities (leg, foot, arm, and hand disabilities, tuberculosis, vision, hearing, cardiac, speech, epileptic, and miscellaneous disabilities.) A follow-up after rehabilitation found 136 of these employed, earning an average of \$31.50 a week; 80% of their employers rated them as better than non-handicapped workers, and 114 were in jobs consistent with or related to psychological recommendations.

34. Pohlmann, K. E. Rehabilitation of the severely disabled: UMWA Welfare and Retirement Fund experience. *Amer. J. Publ. Health*, 1953, 43 (1), 445-451.

One hundred sixty-one severely disabled miners (paraplegics, amputees, etc.) who had had vocational rehabilitation services were employed in a variety of jobs: mining, farming, clerical, factory, etc., including self-employment and elective office. Yearly earnings ranged from \$520 to \$4,160, with a weekly average for the whole group of \$41.63. Average length of employment was 14.5 months.

35. Reuschlein, H. G. et al. *Survey of handicapped workers: report of citizen's committee*. Pittsburgh: Allegheny County Health & Welfare Federation, 1955.

A survey of handicapped workers and a community action program based on the survey are described. In six months, 111 handicapped persons participated in the program. A follow-up of these persons three years later found 66% employed and earning an average of \$28 a week. Case histories of the 111 handicapped persons are presented.

36. Sanua, V. D., Diller, L., Lommer, A., & McCaritt, M. E. The vocational rehabilitation problems of disabled Puerto Rican in N.Y. City. *Rehabilit. Monogr. XII*, New York: The Inst. of Physical Med. & Rehabil., New York Univer. Bellevue Med. Center, 1957.

Despite a language handicap and a fear of agencies and institutions, handicapped Puerto Ricans tended to profit from rehabilitation. The records of 222 Puerto Ricans show an increase in average weekly earnings from \$34 before rehabilitation to \$40 after. Other problems of rehabilitating handicapped Puerto Ricans (such as rapport and cultural conflict) are discussed, based on follow-up interviews of 33 rehabilitated Puerto Ricans.

B. Survey Studies

On the blind:

37. Bauman, Mary K. *Adjustment to blindness*. Harrisburg, Pa.: State Department of Welfare, 1954.

This study of 443 blind persons was based on interviews, results of psychological tests, records of education, employment history, living conditions, and medical and ophthalmological data. The well-adjusted, employed individuals

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were superior in intelligence, education, and manipulative ability. Family reactions were related to adjustment. Mental ability and emotional factors were related to success or failure in professional and factory jobs. Amount of vision was not consistently related to type of occupation. The blind in this report have had to accept unsuitable jobs before achieving satisfactory vocational adjustment. Detailed findings on other questions are reported.

38. Veterans Administration: Blinded veterans. *J. Amer. Med. Ass.*, 1947, 134 (1), 304.

A Veterans Administration survey of 1,133 blinded veterans discharged by the Army and Navy up to the end of 1946 showed that 28% were employed in full-time or part-time jobs, and 20% were in vocational rehabilitation training.

On the cerebral palsied:

39. Connell, Katherine A. An occupational therapist's approach to the vocational problems of the cerebral palsied. *Amer. J. occup. Ther.*, 1950, 4, 214-223.

Of 626 persons with cerebral palsy who received vocational training for one to two years, 50% found employment, the greatest number being employed in clerical jobs. About a fifth of these were self-employed. The value of occupational therapy in vocational rehabilitation is discussed.

40. Odoroff, M. E. Vocational rehabilitation for the cerebral palsied. *Nervous Child.*, 1949, 8, 214-221.

Eighty-four per cent of the cerebral palsied clients were unemployed before rehabilitation. Ninety-five per cent were employed after rehabilitation. Other facts about 2,689 cerebral palsied individuals rehabilitated by the Office of Vocational Rehabilitation between 1944 to 1948 are presented.

On the deaf:

41. Dunn, J. H. Report of special project to study Wisconsin's rehabilitation problems associated with deafness. Madison, Wis.: State Board of Vocational and Adult Education, 1957.

A survey of 866 deaf or hard-of-hearing persons found 63% employed at an average weekly wage of \$65; 12% were unemployed, 12% were housewives, and 12% were students. Average length of employment was six years. About 44% started training in skilled trades but only half completed their training. Of those employed, 61% had jobs not related to their training and skills.

42. Lavos, G. & Jones, E. W. The deaf worker in industry. *Amer. Ann. Deaf*, 1946, 91, 154-176.

Study of 56 deaf workers in a large plant revealed that these individuals were about the same as or superior to non-handicapped workers in productivity and social adjustment to their supervisors and co-workers.

On heart patients:

43. Franco, S. C. The cardiac can work. *Industr. Med.*, 1954, 23, 315-320.

Records of a large Eastern company (24,473 employees) show: (a) about 3.6% of the work force were cardiac patients; (b) about half of these were retained in their original jobs after suffering from heart diseases, the rest being transferred to lighter work; (c) heart patients occupy positions representing some 400 job classifications.

44. Poole, F. E. & Bent, J. R. The employment of cardiacs. *Industr. Med.*, 1944, 13, 479-486.

Data on 777 employed cardiacs were compared with data on the firm's work force in general. The cardiac group was similar to the general work force in age, job classification, starting pay rate, quitting pay rate, voluntary terminations, and reasons for quitting. The cardiac group differed from the general work force in the following: a lower absenteeism rate; more lost-time accidents; fewer insurance claims for lost-time accidents; more hospitalization claims; fewer medical and surgical claims; and longer duration of employment.

45. Master, A. M., Jaffe, H. L., Teich, E. M., & Brinberg, L. Survival and rehabilitation after coronary occlusion. *J. Amer. Med. Ass.*, 1954, 156 (2), 1552-1556.

Work histories were obtained on 343 patients who survived coronary occlusions. Employment status was found associated with post-occlusion symptoms, i.e., proportion employed was greatest for groups without cardiac symptoms or with mild angina or dyspnea, and least for groups with moderate or with intractable angina or dyspnea; and the reverse was true for proportion unemployed. The data indicated that the outlook for patients who returned to work is at least as good as it is for those who retire.

46. Thompson, W. B. & Huntington, C. S. The cardiac strikes oil. *Industr. Med. & Surgery*, 1956, 25, 463-465.

Records of 432 employees with cardiovascular disease show that they were able to perform a variety of jobs: white-collar, skilled, semi-skilled, and restricted skilled manual work; and even moderate or heavy labor. Absenteeism rates were slightly higher for the cardiacs than for all employees.

On the mentally retarded:

47. Coakly, Frances. Study of feeble-minded wards employed in war industries. *Amer. J. ment. Defic.*, 1945-46, 50, 301-306.

Thirty-seven feeble-minded persons (I.Q.'s under 75), who were wards of the state for an average of 6.2 years, were employed in unskilled and semi-skilled jobs. Average weekly wage earned was \$40.48. The average length of employment was 17.4 months. Most of the group obtained jobs through their own efforts or through the USES. No relationship was found between I.Q. and wages.

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48. Guralnick, D. Vocational rehabilitation services in New York City for the mentally retarded. *Amer. J. ment. Defic.*, 1956-57, 61, 368-377.

Only 69 of 248 persons counseled found employment. Experience indicated that relatively few persons with I.Q.'s below 59 (even fewer with I.Q.'s below 54) were able to benefit from rehabilitation services to enter competitive employment.

49. Krishef, C. H. & Hall, M. A. Employment of the mentally retarded in Hennepin County, Minnesota. *Amer. J. ment. Defic.*, 1955-56, 60, 182-189.

A study of 177 mentally retarded individuals (I.Q. 79 and below) showed only 14 unemployed; 25% of the employed had held their jobs 5 years or longer; 86% were satisfied with their jobs. Average 1952 incomes: \$2,050 for males and \$1,511 for females with I.Q.'s between 60 and 79; and \$1,850 for males and \$1,340 for females with I.Q.'s of 59 and below.

50. Potts, Jane H. Vocational rehabilitation for the mentally retarded in Michigan. *Amer. J. ment. Defic.*, 1952-53, 57, 297-370.

A study of 168 mentally retarded rehabilitants (I.Q. 40 to 75+) indicated that (a) counselors devoted more time per case to the mentally retarded client than to clients with other handicaps, except the emotionally handicapped and the severely disabled; (b) on-the-job training was the most suitable training method for mentally retarded clients; (c) above I.Q. 40, success on a job was associated more with personal adjustment than with I.Q. Before rehabilitation only 13 of the group were working; after rehabilitation all 168 were placed in unskilled and personal service jobs.

On orthopedic patients:

51. Wagner, T. *Selective job placement*. New York: National Conservation Bureau, Association of Casualty and Surety Executives, 1946.

One thousand two hundred orthopedically disabled male workers were compared with a matched control group of non-handicapped workers. Findings include: (a) no difference between groups in work efficiency; (b) properly placed, handicapped workers are slightly superior to non-handicapped workers; (c) accident-frequency rate is lower and accident-severity rate is higher for handicapped than for non-handicapped workers; and (d) handicapped workers are less efficient in the first year of employment, become equal or superior to non-handicapped workers in efficiency after the first year.

On poliomyelitis patients:

52. Lowman, C. L. & Seidenfeld, M. A. A preliminary report of psychological effects of poliomyelitis. *J. consult. Psychol.*, 1947, 11, 30-37.

Interviews with 203 male and 234 female poliomyelitis patients revealed that (a) most of them were restricted in employability; (b) full-time employment varied directly with degree of physical restriction; (c) a slight relationship appeared between employment and conspicuousness of deformity; (d) education

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and intelligence were significant factors in finding employment; (e) surgery was a major factor in vocational and social adjustment.

53. Seidenfeld, M. A. Psychological elements in work interference from physical disability. *J. consult. Psychol.*, 1957, 11, 326-333.

From interviews with 91 male and 43 female employed poliomyelitis patients, it was concluded that disability was not a major factor in employment difficulties. Regardless of degree of physical involvement, most employed poliomyelitis patients reported little or no interference in work from their disability. Only those whose employability was restricted to specific types of occupations reported their disability as vocationally handicapping.

54. Wendland, L. V. Employment prognosis of the post-poliomyelitic. *J. appl. Psychol.*, 1952, 36, 328-332.

The employment histories of 68 male and 83 female post-poliomyelitis patients generally showed job stability and incomes which compared favorably with those of the non-handicapped. Physical involvement or need for a prosthesis did not seem to be factors associated with unemployment.

On seizure patients:

55. Lennox, W. G. & Cobb, S. Employment of epileptics. *Industr. Med.*, 1942, 11, 571-574.

Replies to a mail questionnaire were received from 608 male and 497 female epileptics of working age from all over the country (84% and 82% respectively of mailing list). About 54% of the men and 48% of the women (51% of the whole group) considered themselves fully able to work. This compares with 59% of the men and 32% of the women (47% of the whole group) who were actually employed.

On several disability groups:

56. Aitken, A. P. Rehabilitation of the employee injured in industry. *New England J. Med.*, 1947, 237, 903-905.

A rehabilitation program established by Liberty Mutual Insurance Co. returned 65% of 666 patients to gainful employment. Evaluation of the program indicated the value of a combination of physical therapy and early work therapy, and the need for educating medical professionals in rehabilitation.

57. Brighthouse, G. The physically handicapped worker in industry. *Industr. Relat. Sect., Calif. Inst. Technol., Bull. No. 13*, 1946.

Comparison of 1815 physically handicapped workers with 538 non-handicapped workers showed: (a) more time was spent in the placement of the handicapped; (b) the handicapped employees' work was slightly inferior in quality and quantity; (c) their accident rate was slightly higher, and their accidents tended to be more serious. However, the handicapped workers were more stable on the job, had longer periods of service and fewer unexcused absences.

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Handicapped workers advanced rapidly through lower grade jobs, but were promoted less often to supervisory positions.

58. Dietz, J. W. An experiment with vocationally handicapped workers. *Personnel J.*, 1931-32, 10, 365-370.

Records of 652 handicapped workers showed that, compared with a matched group of non-handicapped workers, they had fewer accidents, fewer absences due to sickness, and a lower turnover rate. Handicapped workers, however, were absent for "personal reasons" more frequently. Both groups were about equal in production and income.

59. Kassous, M. D. & Hammond, H. S. Work performance of physically impaired workers. *Mon. Labor Rev.*, 1948, 66, 31-33.

A two-year study of more than 30,000 impaired and unimpaired workers in 109 plants indicated that: (a) impaired workers were as efficient as unimpaired workers; (b) impaired workers lost slightly more time through absenteeism, but had slightly better safety records; (c) impaired workers were not hazards to others or to themselves; and (d) quit rate for impaired workers was slightly higher.

60. Morton, F. L. Management of the physically handicapped personnel. *Industr. Med.*, 1945, 14, 306-311.

Observation of 1717 handicapped workers over an 18-month period showed that handicapped workers had a much lower rate of separation, a much lower sickness and disability rate, and a slightly smaller frequency of injuries. The essentials of a program for handicapped workers and problems encountered in the management of physically handicapped personnel are described.

61. Whittico, J. M., Lawrence, M. S., Stauffer, Dorothy, & Elmer, R. Three year pilot rehabilitation study in a general hospital. *J. Amer. Med. Ass.*, 1957, 164 (5), 1633-1635.

A 3-year rehabilitation program was instrumental in returning 25 of 86 rehabilitants to full employment; 17 more were still training and nearing complete rehabilitation at the time of the study. The rest did not show any promise of being rehabilitated. The operation of the program was complicated by the segregation problem, since nearly all the rehabilitants were Negroes.