

ON PREDICTION OF VOCATIONAL REHABILITATION OUTCOME AT A SWEDISH EMPLOYABILITY INSTITUTE

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Objective: The main objective of this investigation was to identify a set of variables usable in early outcome prediction of vocational rehabilitation.

Design: On commencement of rehabilitation at an employability institute, data were sampled using structured interviews and checklists. Two years later the subjects were followed up by telephone interviews.

Subjects: The study sample was all unemployed with a somatic disorder as the cause of vocational disability, admitted from October 1995 to December 1996 ($n = 149$). Of these 109 (73%) agreed to participate.

Methods: Initially, data on demography, symptoms, expectations/beliefs about future capacity for gainful employment and sense of coherence (as an indicator of coping resources) were sampled. At follow-up the subjects' vocational situations were recorded.

Results: At follow-up, 40% were working or employable. Among the about 30 variables included, logistic regression showed that having a relatively high belief in vocational return (odds ratio, OR: 4.6, CI: 1.4–15.4), having a relatively high sense of coherence (OR: 3.5, CI: 1.5–8.4) and having a relatively high educational level (OR: 2.6, CI: 1.1–6.3) were significant predictors of positive outcome.

Conclusion: In this sample, socio-psychological and educational aspects were far more predictive of outcome than were medical circumstances.

Key words: outcome prediction, vocational rehabilitation, employability institute, beliefs and expectations, sense of coherence.

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INTRODUCTION

In Sweden the success of vocational rehabilitation appears limited. Thus in 1997, 17% of the rehabilitees had a job 6 months after vocational rehabilitation at Swedish employability institutes (1). The aim of this prospective study was to determine whether the outcome of the vocational rehabilitation of somatically disabled job-seekers at an employability institute

(EI) in Uppsala, Sweden could be predicted by simple demographic factors, symptoms of illness, the rehabilitees' expectations, their beliefs about their future capacity for gainful employment, the importance attached to having a job and their sense of coherence.

If predictors for vocational rehabilitation at the EIs can be identified, these predictors may prove useful in supporting individuals towards return to work, with the hope that this will lead to more effective use of the limited resources available.

The central authority of the Swedish Labour Market Administration is the National Labour Market Board. In each county a Labour Board is responsible for the local EIs. The overriding task of the EI was to provide support and resources for vocationally disabled job-seekers and others who needed particular help in finding, obtaining and holding down jobs. A person who has an impairment that negatively affects his/her ability to work is defined as vocationally disabled.

This prospective investigation was carried out at the Uppsala EI. The staff at the institute included employment consultants, psychologists, a physiotherapist, occupational therapists and a consultant physician (RM) in rehabilitation medicine. Two basic services were vocational counselling and vocational decision courses aiming to define the rehabilitees' wishes about future jobs and to provide information about what was needed to manage such jobs. Other services at the EI were aptitude testing, psychological and social support and practical work testing. Work testing could be performed at the EI, in which special work places were established, or at employers who were willing to receive the job-seeker for a period of, generally, 1–3 months. On the other hand, the EI did not provide, or only to a very limited extent provided, medical services and physical rehabilitation. Employment of vocationally disabled could be facilitated by varying degrees of wage subsidies and by adapting the workplaces and the work environment to make them suitable for disabled people. Recommendation for or placement in different courses was a possible intervention, and the maximum length of such studies was generally 1 year. Those who were severely vocationally disabled could be referred to a sheltered work company, supported financially by the government.

At the time of the investigation unemployment compensation was up to 80% of income prior to unemployment, generally during a maximum of 300 days. A person who got unemployment compensation was supposed to be employable, e.g. able to take an offered suitable job immediately. A major reason for referral to the EI was that the job-seeker was not able to continue

Table I. Proportions (%) of 109 work-disabled unemployed persons (56 women, 53 men) referred to an employability institute reporting different symptoms of chronic somatic impairment, by immigrant status and gender (I = immigrants, n = 41; NI = non-immigrants, n = 68). As the number in the I group was <50, proportions are given in brackets. The question concerning symptoms was formulated in English translation as follows: Have you, during the last 12 months had ...? Mark only symptoms that restricted your work or leisure. Response alternatives were yes and no

Item	I/NI n = 41/68	Women/men n = 56/53
1. Long-lasting pain	(95)/90	95/89
2. Head and neck symptoms	(73)/44 ^b	66/43 ^a
3. Thoracic/lumbar back symptoms	(63)/63	68/59
4. Shoulder/arm symptoms	(68)/62	71/57
5. Hip/leg trouble	(54)/62	63/55
6. Other locomotor symptoms (such as joint symptoms or muscle pain)	(51)/57	64/45 ^a
7. Sleep disorders	(66)/47	54/55
8. Mental symptoms	(22)/21	23/19
9. Disease or injury of the nervous system (brain, spinal cord, nerves)	(10)/12	11/11
10. Other symptoms due to accident(s)	(2)/10	4/11
11. Eye disease or visual impairment	(7)/34 ^b	23/25
12. Ear disease or hearing impairment	(7)/15	7/17
13. Pulmonary illness (including asthma)	(17)/6	9/11
14. Skin disease (including eczema)	(15)/32 ^a	29/23
15. Hypersensitivity/allergic reactions from nose/eyes	(17)/35 ^a	34/23
16. Heart ailment and/or high blood pressure	(17)/6	5/15
17. Gastro-intestinal/liver/kidney disease	(39)/13 ^b	25/21
18. Diabetes (mellitus)	(2)/2	0/4
19. Miscellaneous	(20)/19	20/19

^a $p < 0.05$ and >0.01 ; ^b $p < 0.005$ and >0.001 .

in the former employment situation and that there was an uncertainty about which job he could manage. Sickness benefit was at the time of the investigation up to 75% of prior income and was 1998 raised to up to 80%. Those not qualified for sickness benefit or unemployment compensation could obtain social benefit (minimum level of necessary expenditures).

MATERIALS AND METHODS

Uppsala is a university and administrative city, situated about 70 kilometres north of Stockholm. At the time of the investigation, the municipality had approximately 185,000 inhabitants.

The study sample consisted of all subjects who were accepted by the EI-team working with people who were vocationally disabled due to somatic impairment and who started their vocational rehabilitation during the period October 1995 to December 1996. All subjects had a somatic disorder, diagnosed by a physician, as the cause of vocational disability. If, after referral but prior to admittance, there was a doubt whether a person really had a somatic medical diagnosis, he/she met the consulting physician (RM) who assessed if this was the case. Those who were vocationally disabled due to mental impairment, abuse problems, or criminality were admitted to other EI teams as were those vocationally disabled by severe lack of vision or hearing. Persons who had participated in vocational rehabilitation at an EI during the preceding 2 years were not included in the investigation. Moreover, only subjects who could master the Swedish language adequately for being interviewed and filling in questionnaires were included. On admission all eligible subjects were informed, orally and in writing, about this investigation. Of a total of 149 eligible individuals (84 women and 65 men) in the study sample, 109 persons (73%, 56 women and 53 men) with a gender-independent median age of 38 years (range 21–58) volunteered to participate on both occasions (see below) of the investigation. On admission they met the consulting physician (RM) individually, filled in questionnaires and a structured interview was performed.

The follow-up 24–25 months later was conducted as a telephone interview by RM. The duration of this interview was 10–15 minutes and it focused whether the subjects were gainfully employed, on unemploy-

ment compensation or on social benefit/sickness benefit/disability pension. Subjects were asked if and for how long time they had been gainfully employed since leaving the EI. They were moreover asked whether they had taken part in rehabilitation activities during the preceding 2 years and if so which type of rehabilitation. Some additional questions were asked, mainly concerning their level of life satisfaction. The results concerning life satisfaction will be reported later.

The investigation was approved by the Ethical Committee at Uppsala University.

Among the approximately 100 initial items included in the structured interview/filling in questionnaires, we have chosen in this report to focus on symptoms, (dichotomies yes/no, see Table I). The intensity of pain, if reported during the preceding week was measured using a standard visual analogue 100 mm scale (VAS ruler). The extent to which the respondents believed that they were capable to work full- or part-time (4-graded scales), the importance, apart from earning money, attached to having a job (5-graded scales) were explored. Two items, belief in vocational return and reported level of health (both 6-graded scales) were adopted from Eklund et al. (2). For details of scaling, see Fig. 1 (a–d). In addition, Antonovsky's (3) Sense of Coherence (SOC) instrument (29 items, 7-graded scales), was included. For pragmatic reasons the abbreviated 13 items version (SOC-13) was used in the computations. This reduction of items has been found valid—for references see Nilsson et al. (4).

The sense of coherence concept was introduced by Antonovsky (5) and defined as: "a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (a) the stimuli deriving from one's internal and external environments in the course of living are structured, predictable, and explicable; (b) the resources are available to one to meet the demands posed by these stimuli; and (c) these demands are challenges, worthy of investment and engagement" (6).

SOC is meant to measure the background for individual coping. A high SOC score indicates likelihood for successful coping with stressors, while a low score generally is associated with relatively poor coping abilities (for references see 3). The instrument has been validated for Sweden (7) and is rather widely used in Sweden (8).

Statistics

For all statistical analyses the SPSS™ version 11.0 statistical program

was used. The chosen level of significance was $p < 0.050$. Spearman's r_s or χ^2 /Fischer's exact test or the Mann-Whitney U-test was applied as appropriate.

A logistic regression (stepwise backward procedure) was applied to test which parameters were the most influential in predicting the outcome, using the odds ratio (OR) to estimate the odds of membership in the outcome group, given the presence of independent variables. In these analyses the dependent variable (outcome) was dichotomized into those working or employable at the follow-up vs those on sickness benefit/disability pension or those who had not finished their vocational rehabilitation after 2 years. Educational level was dichotomized into those having compulsory school, (generally 9 years) vs upper secondary school of further 3 years or university studies as the highest educational level. Age was dichotomized over the median. Perceived good health was dichotomized into very often-always/often/rather often vs very rarely-never/rarely/rather rarely.

likely/likely/rather likely versus very unlikely/unlikely/rather unlikely, belief in ability to work full- or part-time into belief in ability to work less than half-time vs half-time or more, importance attached to having a job into very great/great vs none/hardly any/some. Finally, SOC-13 was dichotomized over the median.

Because of the relatively small sample size, a series of 3 logistic regression analyses were performed: first separately for the demographic variables (gender, age, educational level, being an immigrant or not and on sickness benefit/social benefit/unemployment compensation on admittance), for the items in Table I (symptoms), and for the expectations/belief/coping resources (dichotomized) variables. The limit for entry/removal was set here to $p < 0.15$ to avoid loss of possibly significant variables in the final calculation. Secondly, the variables with significant contribution to any of the three initial equations were included in a logistic regression. In the final logistic regression analyses, the limit for entry/removal was set to $p \leq 0.05$.

RESULTS

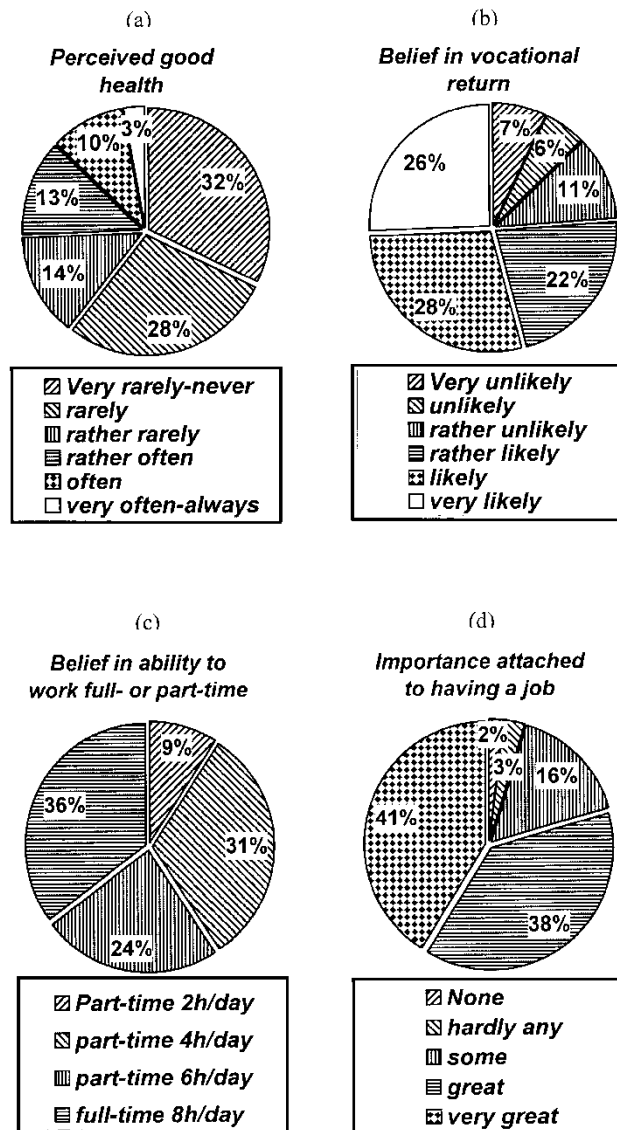


Fig. 1. Proportions (%) of work-disabled persons (56 women, 53 men), with a diagnosis of somatic disorder and referred to an employability institute, reporting different levels of (a) perceived good health, (b) belief in vocational return, (c) belief in ability to work full- or part-time and (d) importance attached to having a job.

Age, gender or being/not being a first-generation immigrant did not differ significantly between the respondents and non-respondents. Totally, 38% of the respondents were first-generation immigrants (defined as those born abroad). This is considerably higher than the 13% of subjects 18–64 years old living in Sweden 1996 but born abroad. Of the participants, 41% had comprehensive school and 59% upper secondary school or higher education. At the start of the vocational rehabilitation 44 respondents were on sickness benefit, 13 were receiving social benefit and 51 were on unemployment compensation.

Eighty-six persons (79%) reported symptoms from the locomotor system as their main obstacle to being vocationally active. Among these, 9% reported light pain (VAS 1–20 mm), 17% moderate pain (VAS 21–40 mm), 37% rather severe pain (41–60 mm) and 37% severe to unbearable pain (VAS 61–100) during the preceding week. There were no significant differences in estimated pain levels between those with long lasting pain, who on admittance were on social benefit or had unemployment compensation, and not either when these 2 groups were pooled and compared with those on sickness benefit on admittance. The remaining 21% reported other symptoms.

There were no significant differences (cross-tabulations, 1 df) in any of the symptom variables or in any of the socio-psychological variables between those who were on social benefit and those on unemployment compensation. With one exception, (symptoms from hips and legs) there were no differences between the pooled group of those on social benefit or unemployment compensation and those who were on sickness benefit.

Table I demonstrates the prevalence of symptoms. In most of those with long lasting pain (97 of 100) the pain was located in the locomotor system. Symptoms from the head and neck were significantly most common in women and in immigrants. About 20% of those with long-lasting pain reported symptoms from all of the different topographical locations (items 2–6), while more than 60% reported symptoms from at least 3 different locations and a further 25% from 2 of them. Sleep disorders were also common. More Swedish-born subjects than immigrants reported eye disease or impaired vision. The immigrants had a three times

higher prevalence of abdominal diseases than the Swedish-born subjects. Moreover, one-fifth of all subjects reported mental symptoms.

When the 2 outcome groups (see below) were compared, those in the negative outcome group had significantly higher estimated pain levels on admittance, ($p < 0.05$).

Socio-psychological aspects

Twenty-six per cent (Fig. 1a) reported that at least rather often they experienced good somatic health and 76% believed that return to gainful employment (Fig. 1b) was at least rather likely. Slightly more than 1/3 of the respondents (Fig. 1c) believed that in the future they would be able to work full-time (8 hours per day) and a further 55% judged that they would become able to work part-time, 4–6 hours per day. Hence, only a small minority believed that they could probably work no more than 2 hours per day. About $\frac{3}{4}$ considered that gainful employment, apart from being a source of income, was of great or very great importance to them (Fig. 1d) and at the opposite end of the scale, work carried no or hardly any importance for 5%. In none of these 4 items were there significant differences between immigrants and those born in Sweden. There was only one significant gender difference, namely that the women believed that they were able to work fewer hours per day than did the men ($p < 0.05$).

The median SOC-13 score was 56 (mean 57) with no significant gender difference while immigrants had significantly ($p < 0.005$) lower scores than the Swedish-born subjects (median scores 52 and 59, respectively).

Outcome after 2 years

For simplification, 2 main outcome categories (positive and negative) were distinguished. These were sub-classified as follows (Fig. 2).

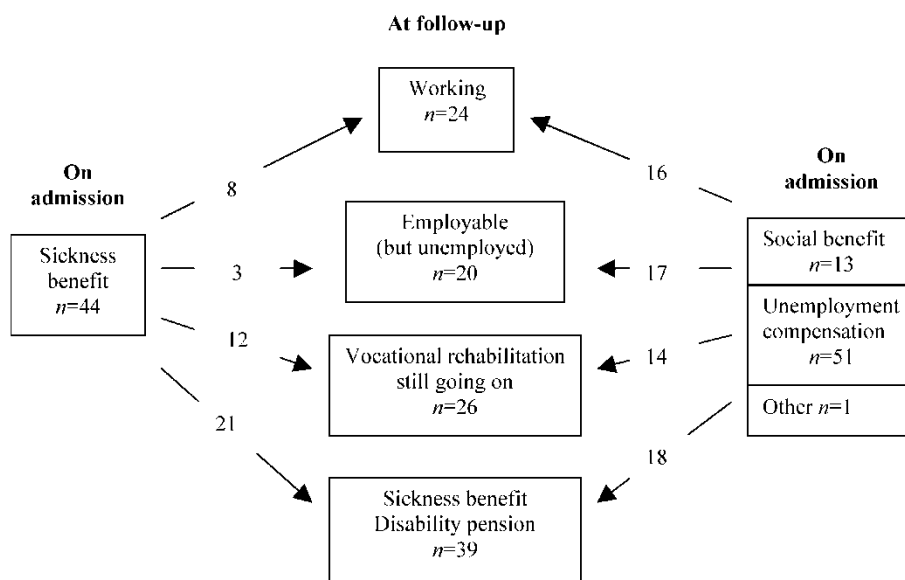


Fig. 2. The number of the 109 vocational rehabilitees receiving sickness benefit and the number receiving social benefit or unemployment compensation on admission to the Employability Institute and their distribution 2 years later among the 4 outcome groups.

Positive outcome (44 subjects)

1. *Working (24 subjects)*. During the 2-year period of this investigation, the subjects in this outcome group had worked between 1 and 24 months (median 12 months), 5 had worked half-time (4 hours per day), 3 75% (6 hours per day) and 16 persons had worked full-time. Seven of them had a wage subsidy but none worked at a sheltered work company.

2. *Employable but unemployed (20 subjects)*. A person was in this study regarded as employable if he/she at follow up received unemployment compensation or otherwise after the period at the employability institute was judged to be able to take a job (c.f. introduction). Six of the subjects in this group had worked from 4 and up to nearly 24 months during the last 2 years.

Negative outcome (65 subjects)

3. *Under investigation/work training/on courses (26 subjects)*.

One person in this group had worked (half-time) for 22 months, but at the time of follow-up was undergoing work training.

4. *On sickness benefit/receiving disability pension (39 subjects)*.

One person was on 75% sickness benefit and worked 25% (2 hours per day), one had had a temporary job for 6 months and another had been gainfully employed during a 12-month period.

Univariate analyses (dichotomies) showed that education higher than compulsory school, being on employability compensation in relation to being on sickness benefit on admission, not having joint symptoms or muscle pain, perceiving good health, having a high belief in vocational return, believing oneself to be able to work half-time or more, attaching great importance to having a job, and having a relatively high sense of coherence were all associated with a positive outcome ($p < 0.05$).

Among the socio-psychological items (full scale used) having a high belief in vocational return, believing oneself to be able to

Table II. Odds ratios (OR), *p* values and confidence intervals (CI) for a positive outcome of the vocational rehabilitation in 109 vocationally disabled persons referred to an employability institute

	OR	<i>p</i> <	95% CI
Relatively high belief in vocational return	4.6	0.013	1.4–15.4
Relatively high SOC	3.5	0.004	1.5–8.4
Relatively high educational level	2.6	0.037	1.1–6.3

SOC = sense of coherence.

work half-time or more, attaching great importance to having a job, and having a relatively high sense of coherence, were associated with a positive outcome ($p < 0.05$).

The series of 3 (see statistics) logistic regressions performed separately for the three groups of variables yielded a total of 9 variables that significantly predicted the outcome: a higher probability for a positive outcome emerged for those who had education higher than comprehensive school, were not immigrants, were not on sickness benefit on admission, did not have joint symptoms/muscle pain, gastro-intestinal disease, or mental symptoms, attached relatively great importance to having a job, had high belief in vocational return, and had a relatively high sense of coherence. In the subsequent step, entering only these 9 variables, three significant predictors emerged (Tables II and III): having a relatively high belief in vocational return, having a relatively high level of SOC-13 scores and having a relatively high educational level.

The overall correct classification was 71%, (negative outcome 75%, positive outcome 64%). To correct for possible confounding effects of the demographic variables: immigrant status, age (dichotomized) and gender, these variables were entered in a subsequent logistic regression together with the 3 significant predictors. This did not at all change the odds ratios of the 3 predictors (to the level of the first decimal).

DISCUSSION

Although there is a wealth of Swedish data from social insurance offices from the 1990s concerning return to work in people who have been or are on sickness benefit, (9–12), only few studies have focused on subjects referred to an EI. It must, though, be pointed out, that our sample is selected, as it stems from one employability institute at a time when the unemployment rate was 8%. Level of unemployment in the home area of the rehabilitees has been found to be a predictor of a successful

outcome of employment rehabilitation in the U.K. (13). On the other hand, our finding that 22% (24/109) were working 2 years after the start of the vocational rehabilitation in this investigation is in line with the 17% overall Swedish EI success rate in 1977 (1).

The endpoint for assessing outcome is obviously situational. It is of course quite possible that some subjects in group 3 and perhaps group 4 will be employable later on. If so, their vocational rehabilitation has been a long process. That vocational rehabilitation may be a time consuming process is illustrated by the fact that at follow-up 49 rehabilitees reported that they during the preceding 2 years had had practical work training, 38 had studied or participated in other courses and 12 reported different medical interventions/physical training.

Several Swedish articles (2, 14) have reported that the subject's own evaluation of his/her prognosis regarding return to work has major predictive value for the outcome of a vocational rehabilitation program. In a meta-analysis of factors predicting extended work disability after an acute period of occupational low back pain Shaw et al. (15), found that expectations for recovery/return to work and coping with pain were important for the early prognosis of low back disability. In the USA the outcome of vocational rehabilitation of subjects with locomotor problems has been reported to be more successful in patients with higher educational levels (16).

The major finding of this investigation, namely that a set of three variables; positive background for successful coping, belief in vocational return and relatively high educational level were sizeable predictors of positive outcome appears to be in principle agreement with these findings. Moreover, Eklund et al. (2) using the same variable for characterizing belief in vocational return, in a more general vocational clientele from northern Sweden found that belief in vocational return and also educational level were among the predictors of vocational return. These authors did not include SOC in their investigation. In contrast to our finding, in northern Sweden the level of experienced health was the main predictor of a positive outcome.

The mean SOC-13 score found here was considerably lower than scores reported in "normative" Swedish studies (17). It thus appears that this sample and in particular immigrants, had a less favourable background for coping with life stressors than have general population samples. This agrees with findings that, after closure of an assembly plant in Sweden, unemployed had lower SOC scores than re-employed (8).

Table III. Cross tabulations between outcome and the 3 significant predictors of the vocational rehabilitation in 109 vocationally disabled persons referred to an employability institute

	Positive outcome <i>n</i> = 44	Negative outcome <i>n</i> = 65	<i>p</i> <
Relatively high/relatively low belief in vocational return	40/4	43/22	0.003
SOC-13 \geq median/ $<$ median	30/14	26/39	0.004
Relatively high/low educational level	32/12	32/33	0.015

SOC = sense of coherence.

Several reports (18, 19), indicate that immigrants are less successful in finding a job in Sweden, a finding which was not confirmed here. The fact that more first-generation immigrants complain of head and neck symptoms than non-immigrants may probably best be explained by difficulties in integration into the Swedish labour market, where immigrants, regardless of their educational background, quite frequently are offered manual, physically burdening jobs (18). A possible explanation for our finding that immigrant status *per se* was not a significant predictor of the outcome may speculatively be our inclusion criterion of adequate knowledge of the Swedish language i.e. a positive bias. Another reason can be that the immigrants had relatively low SOC and in the final logistic regression analysis, immigrant status was “weighted out”.

We have no explanation for the fact that Swedish-born subjects had more eye and skin symptoms and allergic reactions. Neither can we explain why in this small sample the prevalence of abdominal illness was three times higher in immigrants than in Swedish-born subjects.

Finally, whereas outcome prediction may be statistically valid it must be pointed out that use of predictors should not lead to an *a priori* exclusion of prospective rehabilitees. The present results may, rather, encourage vocational rehabilitators to pay respect to the attitudes and adaptational resources of the subjects. It is hoped that this will lead to a better success rate in return to gainful employment.

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