

# Can people with disabilities gain from education?

*Similarities and differences between occupational attainment among persons with and without disabilities*

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## Abstract.

**BACKGROUND:** More knowledge is needed of occupational attainment of persons with disabilities, i.e. the relationship between their educational level and their profession, and factors of importance for this relationship.

**OBJECTIVE:** To compare occupational attainment among persons with and without a disability.

**METHOD:** 3396 informants with disabilities and 19004 non-disabled informants participated (control group) in a survey study by Statistics Sweden. The informants with disabilities were divided into six groups.

**RESULTS:** Occupational attainment did not differ between the disability groups, neither between persons with and without a disability. Follow-up analysis showed that men with disabilities with primary or secondary school had an occupation above their educational level to a significantly larger extent than women with disabilities. This pattern was even clearer in comparison with the control group. Persons without disabilities, with secondary or higher education, were more successful in the labor market than persons with disabilities. Occupational attainment increased with age in both groups.

**CONCLUSIONS:** Young women with disabilities who only have primary or secondary education run a higher risk of having a job that is below their educational level than men at the same educational level. This indicates discriminating mechanisms in the society related to gender and ability.

Keywords: Discrimination, occupational attainment, education level, self-estimated work ability

## 1. Introduction

In Europe as well as in many other countries there is much concern about the labor market situation for people with disabilities. The reason for this is that the gen-

eral unemployment rate has increased in recent years, which is likely to aggravate disadvantaged groups' opportunities to support themselves without assistance from the community. Education is a factor that affects the possibilities to obtain a job, irrespective of disabilities. A well educated population is seen as an important counter-acting mechanism for unemployment and social exclusion [29,30].

The labor market has changed over the last decades and the need for a higher education more than primary

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school has increased, although there are still a number of positions that do not require any higher education. People with disabilities have, in a historical perspective, a lower educational level, and hence, a weaker position at the labor market than people without any disability. This situation is changing and people with disabilities more and more often attain higher educational levels [18,40,41].

Grönvik [16] identified three ways to define the concept of disability: administrative, functional and subjective definitions. The functional definition is based on a medical understanding of disability, the administrative on the distribution of welfare benefits, and the subjective definition on whether the person conceives him/herself as disabled. The present study is based on data collected by Statistics Sweden and it is the informants themselves that indicate whether they have a disability and whether they have reduced work ability, hence a subjective definition was used regarding both concepts.

Several studies (e.g., [11,21,24,34]) focus on the problems that a certain disability group has on the labor market, without making comparisons between groups with different disabilities. However, in Surveys on Living Conditions, e.g. those performed by Statistics Sweden which the present study is based on, data are often classified in many groups of disabilities. The results from those studies mainly concern how demographic variables, as well as other variables such as education and workability differ between the groups. However, there is a need today, as OECD [30] pointed out, for an operational labor market policy that addresses the obstacles that different groups of people with disabilities encounter. In line with that, Bengtsson and Greve [4] emphasizes the importance of a person-orientated concept in contrast to a situation orientated concept, to carry out surveys of people with disabilities, i.e. if the aim is to describe a group of people, one must begin by identifying the group. They are well aware of shortcomings and limitations of such an approach but after reviewing its pros and cons their conclusion is that a person-oriented concept is necessary if we want to make reasonable statements and descriptions about the living condition for people with disabilities. In a previous study [6] we addressed this issue, by comparing people's employment chances in six disability groups (Hearing, Speech-Reading, Vision, Psychological, Medical and Physical) and discussed the mechanisms behind this. We found that the employment rate differed between the disability groups. The highest employment rate was found in the group with hearing im-

pairment and the lowest rate among those with a psychological disability. The present study used the same categorization into six disability groups, but analyzed only the group of people with disabilities that was employed, and the association between their educational and occupational level, here called their *occupational attainment*.

### 1.1. Education and occupation

Several studies have shown that education is an important factor for people's chances to be employed [7, 17,22,39,41]. Moreover, it is known that, in average, people with disabilities have a lower educational level than the general population [38–40] and that students with disabilities face more obstacles, such as poorly adapted facilities, compared with students without disabilities (e.g., [7,17,22,35]). However, personal care and independent living have been shown to enhance the transition to higher education [47] and a late onset of disability is associated with an increased likelihood to complete secondary school [23]. Higher education has also been found to be the main factor to a smooth transition into working life for people with disabilities [37].

Research concerning the relationship between educational level and workplaces for people with disabilities is limited. However, the survey conducted by Statistics Sweden, every other year since 1996, gives an overview of factors of importance for occupational areas for people with disabilities. To briefly sum up the results, it was found that a large part of people with disabilities was found in service, care and sales and professions without educational requirements. Moreover, there was a difference between men and women with disabilities, regarding the proportion of employees and entrepreneurs, i.e. women were more often employed and men more often entrepreneurs. This pattern was also found for people without disabilities and people with impaired work ability. However, one aspect that differed between persons with disabilities and those without was in which sector they had an employment. That is, people with disabilities were to a higher extent than people without employed in the public sector. This difference becomes even more pronounced for individuals with a disability who rated themselves as having a reduced capacity for work [39–41].

### 1.2. Which factors are related to occupational attainment?

Research on occupational attainment among people with disabilities has been very sparse [45]. However, it

seems likely that factors that affect the chance of getting an employment also are of importance for occupational attainment.

Previous studies have found that people with disabilities face more obstacles to get a job (e.g., [11,21,24,34]) and have lower educational level compared to people without disabilities [39,41]. However, there are also educational and occupational differences found between groups with different disabilities [6,8,10]. Clausen, Greve Pedersen, Olsen and Bengtsson [8] suggested that the problem for the group with a psychological disability might be a result of their lower education level. Their study was followed up by Boman, Kjellberg, Danermark and Boman [6] who separated three sub-groups among the persons with communicative disabilities. Their main conclusion was that the informants with hearing disabilities had the highest probability to be employed and that this advantage was independent of age, gender, education, ethnic background, residential region and self-estimated work ability. Previous research, which highlighted gender differences among people with disabilities from a work perspective, shows that the structure of working life often favours men [36,46]. Women more frequently experience problems at work, such as lack of enthusiasm and poorer health status [9]. Men stress economic aspects of work while women regard psychosocial aspects of work as more important [12]. Women more often have monotonous work tasks – a factor that may ultimately lead to a higher risk of being classified as a person with a disability, and in addition women earn lower wages [1,15,32,33]. Together, these studies indicate that having a disability and being a woman implies a double disadvantage on the labor market [2,3,20,25,26].

Recession has effects on people's employment possibilities and what kind of employment people have, and the people with disabilities is a particularly vulnerable group during such periods [29,30]. Moreover, the risk of acquiring a disability increases with rising age, and people with disabilities as a group, therefore have a high average age. The majority of people with disabilities are in the age group above 50 years, and studies have shown that employment among people with disabilities decreases fast after the age of 40, especially for those who had no education beyond secondary school [28,39–41]. Studies show that, regardless of whether a person has a disability, the age group with the best chances on the labor market is people in their forties [40,41]. Recession and age distribution thus may contribute to the lower employment rate among the persons with disabilities [17].

Research on people with disabilities, with another ethnic background than Swedish, shows that their risk of being unemployed [14] and having poor health status [4] is higher than among ethnic Swedes. Besides, both having a disability and being an immigrant increases the risk of having a work that is below one's educational level [45].

In general, availability of work positions is lower in Northern Sweden and on the island of Gotland than other parts of Sweden, and at the same time, the highest proportion of people with disabilities reside in northern Sweden [40,41]. Thus, it is important to analyze the significance of residential region and foreign background on occupational attainment among disability groups.

It is of the greatest importance to gain further knowledge about reduced work ability for people with disabilities as they represent a group that has a low level of education, high unemployment and generally low income [39,42,45].

Based on the existing body of knowledge, one can conclude that the possibility for people with disabilities to gain employment that corresponds to their educational level probably is related to their type of disability and its consequences for their work ability (e.g., [19]). Other important factors are age, gender, ethnic background and their region of residence. Some of the studies show that these associations are an effect of discriminating mechanisms in the society (e.g., [3,5,6,27]).

## 2. Aim and research questions

The overall aim of the present study was to compare occupational attainment among persons with and without a disability. To do so, following research questions were formulated:

- (i) How are type of disability, gender, age, ethnic background, residential region and self-estimated work ability related to occupational attainment for people with disabilities?;
- (ii) Is there a difference between people with disabilities and people without disabilities' occupational attainment and
- (iii) is there a difference between men and women and
- (iv) between different age groups in this respect?

## 3. Method

The study was a cross-sectional survey study including one group that reported that they had some type of

Table 1  
Proportion and percentage of level of education for type of disability, the disabled group and the control group

Groups	Primary school education <i>n</i> / <i>%</i>	Secondary school education <i>n</i> / <i>%</i>	Higher education <i>n</i> / <i>%</i>
Type of disability			
Com-Hearing ( <i>n</i> = 439)	82/18.7	220/50.1	137/31.2
Com-Speech-Reading ( <i>n</i> = 153)	30/19.6	92/60.1	31/20.3
Com-Vision ( <i>n</i> = 167)	23/13.8	95/56.9	49/29.3
Psychologically ( <i>n</i> = 133)	22/16.5	72/54.1	39/29.3
Medically ( <i>n</i> = 1560)	258/16.5	841/53.9	461/29.6
Physically ( <i>n</i> = 944)	206/21.8	552/58.5	186/19.7
Disabled Group ( <i>n</i> = 3396)	621/18.3	1872/55.1	903/26.6
Control Group ( <i>n</i> = 19004)	2546/13.4	9486/49.9	6972/36.7

Note. Missing data: 0.3% in the disabled group reported no education and they were excluded from the analyzes.

disability and a reference group without any reported disability.

### 3.1. Participants

The present study is based on the extended regular labor investigation carried out by Statistics Sweden in the fourth quarter of 2004 where extension concerned questions about disabilities [38]. The survey included interviews with 29816 persons between the ages of 16 and 64. Of these, 24656 persons reported that they did not have a disability and 5160 persons reported that they had some type of disability. No questions about medical treatment and the severity of the disability were asked during the interviews. The questions addressed in the present study required following data reduction: All respondents (333) between 16–19 years of age were excluded. Most people in this age group were still in secondary school and not yet available to the labor market. All persons reporting an intellectual disability were also excluded, since this group was small (12 people) and also has a legally based right to activity according to the Law on Support and Service. A further reduction of the data was made by excluding the 253 respondents who only reported a disability not found among the response alternatives, or reported this disability as their primary one (34 respondents). Furthermore, the 169 respondents who reported several disabilities without indicating which one was primary were also excluded. Finally, informants that were not employed (955 persons) and informants not reporting any educational level (8) were excluded, which ended up to a total of 3,396 persons.

The present study also included a control group without any disability (19,004 individuals between 20–64 years old). The control group was randomly chosen by Statistics Sweden from their regular labor force investigation 2004.

### 3.2. Dependent variable

*Occupational attainment.* The dependent variable ‘occupational attainment’ was created by combining the variables *educational* and *occupational level*. The first variable, educational level was measured by classifying the informants’ highest completed level of education according to Swedish education nomenclature (SUN): into the categories: ‘primary education’, ‘secondary education’ and ‘higher education’ (Table 1). The second variable, occupation, was categorized according to Swedish Standard Classification of Occupations from 1996, into nine subgroups. Table 2 shows both the informants’ current occupations and also level of education that we defined was required for each profession.

Thus, the new dependent variable ‘occupational attainment’ was created by dividing the informants into three sub-groups: (i) an occupation below their educational level; (ii) an occupation corresponding to their educational level; and finally (iii) an occupation above their educational level.

In the analyses it was taken into account that people with primary school education cannot have an occupational attainment below their level of education, and people with higher education cannot have an occupational attainment above their educational level.

### 3.3. Independent variables

The first step was to analyze how occupational attainment varied as a function of the different types of disabilities, gender, age, ethnic background and residential region. Data for the control group comprised, besides the variables educational level and occupation described above, a division in age groups and gender. This enabled analyses of differences between people with disabilities and people without disabilities’ occupational attainment, differences between men and women and between age groups in this respect.

Table 2  
Persons with employment in the disabled and control group by occupation (%)

Occupation	Disabled group ( <i>n</i> = 3396)	Control group ( <i>n</i> = 19004)
Management	4.1	5.6
Work requiring special theoretical competence	14.3	19.8
Work requiring short university education	16.2	21.0
Office and customers service	9.7	9.2
Service, care and sales	22.0	18.2
Agriculture, gardening, forestry, and fishery workers	2.8	2.0
Handicraft in construction and manufacture	12.8	10.1
Process, machine operator and transport worker	13.3	10.2
Elementary occupation	4.8	3.9

Notes. Occupations requiring higher education. Occupations requiring compulsory school education. Occupations requiring primary school education.

### 3.3.1. Type of disabilities

In Statistic Sweden's disability investigation, disabilities are categorized as deafness, hearing impairment, dyslexia, blindness/vision impairment, stuttering, language/speech or voice disorder, psychological impairment, asthma/allergy, diabetes, heart-lung conditions, gastrointestinal disease, psoriasis, epilepsy, physical impairment, and finally intellectual disability. Thus, the disabilities reported in Statistic Sweden's [39] report, were divided into 16 subgroups and people who had several disabilities were to indicate their primary disability. In the present study a broader classification was carried out, to enable analyses of differences between groups of disabilities regarding their occupational attainment. This division was made based on earlier studies, by Boman et al. [6] on disabilities and employment, that divided disabilities into six groups: 'communicatively-hearing', including deaf and hearing impaired informants, 'communicatively-speech-reading' including informants with dyslexia, stuttering, language/speech or a voice disorder, 'communicatively-vision', including informants with blindness and vision impairment, 'psychologically', 'medically', including informants with asthma/allergy, diabetes, heart-lung conditions, gastrointestinal disease, psoriasis, epilepsy, and informants with 'physically' disabilities. The reason for making this division of the group with a communicative disability was that there are reasons to believe that the group with a hearing impairment differs in many important respects from others with a communicative disorder.

### 3.3.2. Gender

In the disability group, a total of 1,705 women (50.3 percent) and 1691 men (49.8 percent) participated, and in the control group, a total of 9,261 women (48.7 percent) and 9,743 men (51.3 percent) participated.

### 3.3.3. Age

The variable 'age' also included data from the disability and the control group. In both groups the informants were between 20 and 64 years of age, and they were divided into five age groups: 20–29, 30–39, 40–49, 50–59 and 60–64 years. The class boundaries were set so that a relatively even distribution was obtained between the age groups.

### 3.3.4. Ethnic background

In the interviews, the informants stated more than 70 countries as their country of birth, and to enable analyses a classification were conducted of ethnicity into six broader categories: 'Sweden', 'Scandinavia', 'EU 15', 'Other European countries' 'Asia, North and South America' and 'Other'. In the last group we merged a number of nationalities that consisted of very few people.

### 3.3.5. Residential region

The informants with a disability also reported the county in which they lived. They were then divided into six groups according to residence: 'Municipality of Stockholm', 'Central Sweden', 'Southern Sweden', 'Western Sweden', 'Northern urban' and 'Northern rural'.

### 3.3.6. Self-estimated work ability

The interviewees estimated how impaired their work ability was as a result of their disability using three categories: 'very impaired', 'partly impaired' and 'not at all impaired'.

## 3.4. Statistical analyses

Person's chi-2 analyses were performed (using SPSS 20.0 for Windows) with occupational attainment as the dependent variable. First analyses were made of the relation between on the one hand, the type of disabil-

Table 3

The proportion of persons' occupational attainment (OCA) for type of disability, gender, age groups, ethnic background, residential region and self-estimated work ability (%) and p-values from chi<sup>2</sup> analyses of group differences

Independent variables	OCA below education level %	OCA corresponding to education level %	OCA above education level %	$\chi^2$
Type of disability				
Com-Hearing ( <i>n</i> = 439)	6.4	66.5	27.1	
Com-Speech-Reading ( <i>n</i> = 153)	6.5	66.7	26.8	
Com-Vision ( <i>n</i> = 167)	8.4	69.5	22.2	
Psychologically ( <i>n</i> = 133)	12.8	60.9	26.3	
Medically ( <i>n</i> = 1560)	7.8	65.1	27.1	
Physically ( <i>n</i> = 944)	7.4	64.3	28.3	ns
Gender				
Men ( <i>n</i> = 1691)	6.2	60.4	33.4	
Women ( <i>n</i> = 1705)	9.1	70.0	20.9	70.7**
Ethnic background				
Sweden ( <i>n</i> = 3092)	7.2	65.7	27.1	
Scandinavia ( <i>n</i> = 110)	3.6	63.6	32.7	
EU 15 ( <i>n</i> = 35)	5.7	60.0	34.3	
Other Europe ( <i>n</i> = 60)	21.7	63.3	15.0	
Asia and America ( <i>n</i> = 81)	21.0	54.3	24.7	
Other ( <i>n</i> = 18)	16.7	55.6	27.8	46.8**
Residential region				
Municipality Stockholm ( <i>n</i> = 453)	9.3	60.0	30.7	
Central Sweden ( <i>n</i> = 420)	8.8	66.2	25.5	
Southern Sweden ( <i>n</i> = 1329)	7.1	66.4	26.6	
Western Sweden ( <i>n</i> = 625)	6.9	64.0	29.1	
Northern urban ( <i>n</i> = 285)	8.4	69.1	22.5	
Northern rural ( <i>n</i> = 284)	7.4	65.1	27.5	ns
Self-estimated work ability <sup>1</sup>				
Very impaired ( <i>n</i> = 465)	8.0	59.4	32.7	
Partially impaired ( <i>n</i> = 1120)	8.8	65.2	26.1	
Not at all impaired ( <i>n</i> = 1790)	6.9	66.6	26.5	ns

\*\**p* < 0.001. <sup>1</sup>Missing data: 21 persons that reported 'do not know' in self-estimated work ability were excluded.

ity, gender, age, ethnic background, residential region and self-estimated work ability and, on the other hand, occupational attainment for informants with a disability. Secondly, to follow up the results, chi-2 analyses for each educational level were performed. Logistic regression analyses were performed of the relation between gender as well as type of disability and occupational attainment to control for the effect of group differences in other respects. Finally, chi-2 analyses were performed to analyze the relationship between occupational attainment among people with and without disabilities and gender and age differences in this respect.

#### 3.4.1. Ethical review

The Regional Ethical Review Board in Uppsala approved the project in April 2005.

## 4. Results

### 4.1. Type of disability and occupational attainment

There was no significant association between occu-

pational attainment and type of disability (Table 3). About two-thirds of all informants had an occupational attainment that corresponded to their educational level. It is also worth noting that about a quarter of the informants with primary or secondary school education had an occupational attainment higher than their level of education. Overall, the pattern between groups with different disabilities, are very similar. In people with psychological disabilities and higher levels of education an occupational attainment lower than their educational level was found, but this was not statistically significant ( $\chi^2(10, n = 3396) = 345.1, p < 0.001$ ). For example, in the group with hearing disabilities 31.2 percent belonged to the highest education group, whereas this was true for only 19.7 percent of the group with physical disabilities. Thus, fewer persons could have an occupation above their educational level among the people with a hearing disability than in the group with physical disabilities. However, the difference between groups with different disabilities remained non-significant also when separate analyses were made of each educational group. Logistic regres-

Table 4

The proportion of persons' occupational attainment (OCA) for primary, secondary and higher education (%) and p-values from chi<sup>2</sup> analyzes of gender differences

	Men	Women	$\chi^2$
<i>Primary school education</i> <sup>1</sup>	( <i>n</i> = 372)	( <i>n</i> = 249)	
OCA corresponding to educational level ( <i>n</i> = 68)	5.4	19.3	
OCA above educational level ( <i>n</i> = 553)	94.6	80.7	29.6**
<i>Secondary school education</i>	( <i>n</i> = 936)	( <i>n</i> = 936)	
OCA below educational level ( <i>n</i> = 87)	2.4	6.9	
OCA corresponding to education level ( <i>n</i> = 1417)	74.9	76.5	
OCA above educational level ( <i>n</i> = 368)	22.8	16.6	30.55**
<i>Higher education</i> <sup>2</sup>	( <i>n</i> = 383)	( <i>n</i> = 520)	
OCA below educational level ( <i>n</i> = 174)	21.7	17.5	
OCA corresponding to educational level ( <i>n</i> = 729)	78.3	82.5	ns

\* $p < 0.01$ , \*\* $p < 0.001$ . Notes. <sup>1</sup>Informants that have a primary school education could not have an occupation that was lower than their education. <sup>2</sup>Informants' with higher education could not have an occupation that was higher than their education.

sion analyses showed that this was true also after control for differences in gender, age, ethnic background, residential region and self-estimated work ability.

#### 4.2. Gender, age and occupational attainment

A clear relationship between gender and occupational attainment was found, i.e. an occupation higher than the educational level was more common among men (Table 3). Among the women 28.7 percent had a higher school education, while the corresponding proportion among the men was only 21.7 percent. As the informants with a higher school education cannot have an occupation that lies over their educational level, this could be a part of the explanation for the difference found between men and women's occupational attainment. However, analyses of the relation between men and women's occupational attainment for each educational level show that this is not the entire explanation. Results from separate chi-2 analyses are presented in Table 4, and from that it can be concluded that a majority of the informants had an occupation attainment that corresponded to their actual education. Further, it was more likely for men than for women in the group with the lowest education, to have an occupational attainment above their level of education ( $\chi^2(1, n = 621) = 29.6, p < 0.001$ ). The same was true for the group with a secondary school education. Besides, men were also less likely to have an occupational attainment below their educational level than women ( $\chi^2(1, n = 1872) = 30.6, p < 0.001$ ). In the group with a higher school education, however, there was a non-significant gender difference.

To follow up this result, a logistic regression analysis was made with occupational attainment below and above educational level as dependent variable. The analysis showed that it was more likely for men than

for women to obtain an occupational attainment that was above their level of education, and that this difference remained significant after controlling for differences in the other independent variables. The differences in occupational attainment below their educational level was also significant, but in opposite direction, as women were over represented in this group. It should be noted that this difference was no longer significant after control for educational differences.

Table 3 shows that the probability of having an occupational attainment higher than level of education increases with age. The same tendency was seen in all three educational groups, but was only significant for informants with a higher school education ( $\chi^2(4, n = 903) = 21.8, p < 0.001$ ). The significant difference between the age groups remained after control of self-estimated work ability. Moreover, separate logistic regression analyses of the variables age and occupational attainment below and above level of education was performed, with the age group 20–29 years as reference group. This analysis shows that, the older a person is the higher probability of having an occupation above the educational level also after a control for other variables. The same reference category was chosen in the analysis of occupational attainment in the group with a low level of education, and the result showed that no differences remained significant after control for other variables.

#### 4.3. Ethnic background, region of residence and occupational attainment

The relationship between ethnic background and occupational attainment was also significant (Table 3). However, after a control for impaired work ability and other group differences, the significance between different ethnic backgrounds disappeared.

Table 5

The proportion of persons' occupational level for primary, secondary and higher education (%) and p-values from chi<sup>2</sup> analyzes of group differences

	Disabled group	Control group	$\chi^2$
<i>Primary school education</i> <sup>1</sup>	(n = 621)	(n = 2546)	
OCA corresponding to educational level (n = 326)	11.0	10.1	
OCA above educational level (n = 2841)	89.0	89.9	ns
<i>Secondary school education</i>	(n = 1872)	(n = 9486)	
OCA below educational level (n = 494)	4.6	4.3	
OCA corresponding to educational level (n = 8005)	75.7	69.4	
OCA above educational level (n = 2859)	19.7	26.3	36.2**
<i>Higher education</i> <sup>2</sup>	(n = 903)	(n = 6972)	
OCA below educational level (n = 1266)	19.3	15.7	
OCA corresponding to educational level (n = 6609)	80.7	84.3	7.71*

\* $p < 0.01$ , \*\* $p < 0.001$ . Notes. <sup>1</sup>Informants that have a primary school education could not have an occupation that was lower than their education. <sup>2</sup>Informants' with higher education could not have an occupation that was higher than their education.

The occupational attainment did not differ significantly between residential regions (Table 3).

#### 4.4. Self-estimated work ability and occupational attainment

About 50 percent estimated that they had impaired work ability. Table 3 shows that self-estimated work ability was unrelated to occupational attainment. Separate analyses of the three educational groups showed that the relation between work ability and occupational attainment was non-significant in the groups with the lowest and the highest education. However, in the group with secondary school education, persons who considered themselves to have work impairment more often had a job below their educational level and less often above this level compared to those without any work impairment ( $\chi^2(4, n = 1863) = 26.9, p < 0.001$ ).

#### 4.5. Occupational attainment – Comparisons with a control group

Further questions of interest in this study was to investigate the differences in occupational attainment between people with and without a disability, and if there were differences between men and women and between different age groups in this respect.

There were no significant differences between people with disabilities and people without a disability in terms of having an occupation below, corresponding or above their actual education. This result was somewhat influenced by differences between the groups' educational level ( $\chi^2(1, n = 22400) = 147.7, p < 0.001$ ). Thus, for example, in the control group 36.7 percent had higher education, whereas this was true for

26.6 percent in the group with disabilities (Table 1). Therefore, separate chi-2 analyses of the relation between occupational attainment among informants with and without a disability were also performed for each educational level (Table 5). In the group with a secondary school education there was a significant difference between the group with disabilities and the reference group ( $\chi^2(1, n = 11358) = 36.2, p < 0.001$ ). An occupation above their educational level was more common in the control group than among the persons with disabilities. A higher percentage among the informants with disabilities had an occupational attainment corresponding to their level of education. The percentage with an occupational attainment below their educational level was the same in the two groups. A significant difference was also found in the group with higher education ( $\chi^2(1, n = 7875) = 7.71, p < 0.01$ ), where a lower percentage of the control group had an occupation that was below their educational level than among the informants with disabilities (15.7 and 19.3% respectively).

#### 4.6. Gender and age – Comparisons with a control group

It was also of interest to analyze differences in occupational attainment between men and women and between age groups. There were no significant differences between men and women with or without disabilities or different age groups in terms of having an occupation below, corresponding or above than their actual occupation. Overall, the pattern between the groups was very similar. Further analyses, of differences between gender and age groups among the informants with disabilities, showed that it was more likely for men than for women to obtain an occupation that



was above their level of education, and that women were over represented in the group with an occupational attainment below their educational level. However, analyses of the relation between men and women's occupational attainment show that for each educational level a majority of the informants without disabilities also had an occupation that corresponded to their education. However, in the group with the lowest education, 95.1 percent of men had an occupation above their level of education, while this was true for only 81.1 percent of the women ( $\chi^2(1, n = 2546) = 129.6, p < 0.001$ ). In the group with a secondary school education, 5.9 percent of the women had an occupation that was below and 21.7 percent an occupation above their level of education. The corresponding figures for the men were 2.9 percent and 30.3 percent, respectively ( $\chi^2(1, n = 9486) = 127.57, p < 0.001$ ). In the group with a higher school education the pattern were almost identical for men and women (see Table 4 for comparisons with the informants with disabilities).

Moreover, it was found that with increasing age, the probability of having an occupation that was above the level of education increased for informants with disabilities. This tendency was significant for informants without disabilities with secondary school education ( $\chi^2(8, n = 9486) = 201.2, p < 0.001$ ) and with a higher school education ( $\chi^2(4, n = 6972) = 416.3, p < 0.001$ ). One interesting difference was found between people with disabilities and people without disabilities between 20–29 years with only primary education, in that 93 percent of the persons without disabilities had an occupational level above their level of education, while this was true for 88 percent of informants with disabilities.

## 5. Discussion

### 5.1. Factors correlated with occupational attainment for people with a disability

The factors that are most correlated with occupational attainment for persons with disabilities turned out to be gender and age. In total, there were basically as many women as men in this study; but there were some differences in gender distribution between different types of disabilities. It is well known that women with disabilities have poorer possibilities to get a job than men [6,36,40,41], and this makes it interesting to examine the relation between education and competence requirements among women with disabilities

who have a job. The main finding, shown in Table 4, indicate that men with primary and secondary school education more often than women had an occupation attainment that was above their education. Women were over represented in occupations without special educational requirement. This means that men with a disability with only primary and secondary school education more often than women receive jobs that require a higher education. Although there were more women who had higher education, there was no significant difference between men and women's occupational attainment in that group. This result agrees well with for example Barron's [3] and Michaliakis' [27] discussion of women being double discriminated. Women choose to a higher extent than men to continue their studies at colleges and universities. Earlier research shows that, despite that, men establish themselves more quickly on the labor market after completing their studies, and that women are weeded out by employers to a greater extent when having equal merits [13]. A plausible interpretation of the results is that there seems to be gender related discriminating mechanisms that results in that for women with low education the possibility to gain a job is lower than for men with the same educational level.

The older the informants in this study were, the more likely it was that they had a work that was above their level of education, and less likely to have a work that was below their actual education. This implies that age compensates for a low level of education. The finding that increased age gives a higher occupational attainment is not particularly surprising, as the possibilities for advancing in an occupation increase with increasing work experience. Analysis of the occupational attainment above the level of education showed that there was no difference between the age group of 30–39 and 20–29. One possible explanation is that the educational period is longer today and it takes longer time to establish in the labor market [29,30].

The analysis of the relation between ethnic background and occupational attainment showed that no significant differences remained after control for work ability and other group differences.

No significant differences in occupational attainment were found between the groups with different type of disability, residential region or self-estimated work ability. Nevertheless, there are interesting aspects to discuss. The first issue is the relation between the type of disability and occupational attainment. Independent of the type of disability, a majority of the informants had an occupational attainment that corre-

sponded to their level of education (Table 3). It is also notable that informants with a psychological disability more often had an occupational attainment that was below their level of education compared with the other groups. Secondly, we note that despite the high level of education in the group with hearing disabilities, they did not to a higher degree than other groups have an occupation that corresponded to their level of education. Considering this, it is surprising that the analysis did not reveal any significant differences between the group's occupational attainment, and explanation could be the wide categorization of occupations and heterogeneous disability groups.

Another question posed in this study was the relation between self-estimated work ability and occupational attainment, and as stated, there were no differences in occupational attainment between informants that had very, partly or unimpaired work ability (Table 3). However, separate analyses of each educational group showed that work ability was important if they had a secondary school education. Another interesting finding is that informants that reported that they had very reduced work ability to a higher extent (32.7%) were found in the group that had an occupational attainment that was above their level of education, as compared with those who reported partly or not at all reduced work ability (26.1 and 26.5%, respectively).

The results showed that the pattern of education was different depending on how the informants estimated the degree of impaired work ability. In total, 894 informants had higher education and, of these, only 9 percent had very reduced work ability. Further, those who did not have reduced work ability had a higher level of education. A possible interpretation of this relation between educational level and self-estimated work ability is that the disability less often represents a serious obstacle in jobs requiring a higher education.

Gender and age differences that were important were also evident, where the women to a higher extent than men, and informants between 50 and 59 years, had very and partly reduced work ability. One possible interpretation could be that older informants with only primary school has over time gained experience to get a job over their level of education, and thereby mitigate the effects of their reduced work ability. Why this pattern does not appear in the secondary school group is harder to explain.

### 5.2. Differences in occupational attainment between people with and without disabilities

We found that people without disabilities had higher level of education (Table 1). People with disabilities

were more represented in work places that required primary and secondary school education and less represented in work that required higher education (Table 2). Further, there were no differences between people without and people with disabilities' occupational attainment or between men and women or between different age groups in this respect. However, a possible interpretation of the results from the separate analyses of the three educational levels is that it is more worthwhile for non-disabled to study further as they to a higher degree had work that was higher or corresponded to their level of education (see Table 5), and that being male and having long work experience, independent of whether one has a disability or not, seems to be sufficient to increase the probability of gaining a work position that lies above the level of education. Finally, young people with disabilities with only primary education had less opportunity to get a job above their level of education compared to young people without disabilities. Taken together, this result is in line with earlier findings (e.g., [39–41]).

### 5.3. Limitations of this study

The possibilities for generalization are in one sense very good because the sample is large and probably representative of the country's population of people with disabilities that can manage a telephone interview. However, there are some limitations related to the use of official statistics based in quantitative surveys with limited space for follow-up questions. The operational definition of occupational attainment was based on a rather crude categorization of occupations, which was further reduced to three levels. It is obvious that there is likely to be a large variation of educational demands within these groups and probably rather much overlap between them. This may of course have weakened group differences in other variables.

The time when the disability was acquired obviously influences the possibility to make a career, and varies both within and between disability groups. It would have been desirable to include this variable in the analyses, but no such information was available.

Another limitation, with regard to validity, is that too few questions were asked that were intended to measure impaired work ability. The informants were asked to report the degree to which their work ability was impaired and to choose between three response alternatives. It is clearly not possible to address the concept of impaired work ability using one simple question [44]. The estimation informants made of their im-

paired work ability was probably connected to the demands placed by their work, and if an informant has a certain job, it is probably because his/her disability does not pose a serious obstacle to managing this job. Ilmarinen, Toumi and Klockars [19] conducted a study designed to explain changes in work ability using occupational and lifestyle factors. In their study, work ability was measured in a more valid way, as the variable was formed by an index covering seven items. Within each of the six disability groups, the level of disability may vary widely and self-reported work ability was the only and very unsatisfactory indicator available of these differences. Thus, the categories made can be seen as very heterogeneous, and the summarized descriptions of them are definitely not valid for all sub-groups in the category and do not necessarily give a true picture of any sub-group. For example, they may give a too positive picture of the situation of the deaf and a too negative picture of the situation for those with an age-related hearing disability. The variations in self-estimated work ability in each group may be seen as an indicator of impairment severity, but this measure has serious weaknesses, as indicated above.

## 6. Conclusions

The overall issue was to examine whether it is worthwhile for people with disabilities to study further. The result shows that people without disabilities with secondary or higher education were more successful in the labor market, compared to people with disabilities. A picture that also appeared in this study was that men with disabilities could make a career with only primary and secondary education, while higher education was required for women with disabilities to succeed. This gender difference appeared even more clearly in the control group. Finally, age compensated for low education among both the group with disabilities and the group without disabilities, and it also seems that more work experience in some sense could compensate for impaired work ability. The results indicate that there exist a number of discriminating mechanisms that counteract the importance of education, especially for women with disabilities. It is important that these types of mechanisms are further investigated.

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