Toward an Equal Level of Educational Attainment Between Deaf and Hearing People in Sweden?

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Various educational reforms in Sweden have resulted in a formally equivalent educational system for deaf and hearing pupils. Has this resulted in equal levels of educational attainment? This article compares 2,144 people born between 1941 and 1980 who attended a special education program for the deaf and 100,000 randomly chosen individuals from the total population born between 1941 and 1980. Data consist of registered information about the individuals in the year 2005. Results demonstrate that the deaf population has a lower level of educational attainment than the reference population. Women have a higher level of educational attainment than men, and younger people have a higher level than older people in each population. Neither sex, age category, nor immigrant background accounts for the variance in the level of educational attainment between the populations. The educational reforms have not been sufficient to reduce the unequal level of educational attainment between deaf and hearing people.

Education in Sweden

Basic Education

The Ecclesiastical Law of 1686 stated that all persons should receive basic education. Education was at that time organized by the church and directed mainly to religious matters. In 1842, the government established the public elementary school, with compulsory attendance, which was initially 4 years and 40 years later became 6 years. The state had the overall responsibility for education, preferably taught by a professional teacher, and the local parish was given charge of this. Teaching in the home took place as well. The focus of education became more general in the 1900s. In 1936, compulsory school attendance was increased to 7 years (fully implemented in 1948), although an additional 1 or 2 years were optional in some locations (Richardson, 2004).

It was not until 1889 that compulsory school attendance was introduced for the deaf (Parsson, 1997). Local municipalities or county councils were in charge of education, and the state had the responsibility to ensure that deaf children received education. In 1913, the government established special schools for deaf children, with compulsory attendance. The curriculum was designed to prepare deaf children for further education and to equip them with skills for independent living.

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of seven regional public schools for the deaf throughout Sweden. The education had a vocational orientation intended to develop self-sufficiency to gain independence. Classes in other subjects (e.g., Swedish, Religion, and Geography) were also given to prepare pupils for confirmation (Förhammar, 1991). In 1938, when the state assumed responsibility for education of the deaf, the number of schools for the deaf was cut down to four. In addition to the regional schools, there was a special national school for deaf pupils with residual hearing, those who were able to lipread well, or those who demonstrated good spoken language. The educational method used in the regional and national schools for the deaf was oral (i.e., teachers used spoken language and pupils were to lipread and respond in spoken language). Teachers were not allowed to use sign language. It is known, however, that pupils themselves used sign language, for example, during breaks (Hermanson, 1999). Even though the educational policy was oral, sign language was used in varying degrees during different periods, in different school subjects, and at different schools.

There were also state-run schools for hearing pupils, in addition to the elementary schools run by municipalities. A project that introduced a comprehensive school was started in the 1950s to create a unified education throughout Sweden. The result of the project was considered successful, and it was decided in 1962 that a compulsory 9-year comprehensive school should be introduced throughout the country (Pärsson, 1997; Richardson, 2004). The special schools for the deaf were also included in this new educational system. In 1965, they were required to provide an education that was equal, in terms of content, to the education offered to hearing pupils. One difference, however, was that the special school education lasted for 10 years, that is, 1 year more than for hearing pupils. This reform changed the purpose of special school education, shifting the focus from vocational to general education (Pärsson, 1997). In the 1970s, the national special school for deaf pupils with residual hearing, those who were able to lipread well, or those who demonstrated good spoken language was made a regional special school for the deaf (Hermanson, 1999). Another change was that a bilingual educational policy (sign language and Swedish) was introduced at special schools for the deaf, as Sweden recognized sign language in 1981 (Andersson & Hammar, 1996). However, bilingualism was not prescribed until the curriculum for special schools was established in 1983 (National Swedish Board of Education, 1983). The changes were gradual, making the date of complete bilingualism in practice difficult to identify.

Further Education (More Than 9 Years of Education)

Various further vocational and theoretical education programs were previously available to hearing pupils. In 1971, however, when the compulsory 9-year comprehensive school was introduced, these different educational options were replaced with a unified type of upper secondary education (gymnasieskolan) (Pärsson, 1997; Richardson, 2004).

For the deaf, further education was initially optional and consisted of short courses available at the special schools for the deaf. At the beginning of the 20th century, further education became compulsory and was now available at separate schools. These schools also focused on vocational training. Traditional views were altered with the labor force shortage during World War II, and new areas of education were introduced. For instance, further education with an entirely theoretical focus was introduced. An upper secondary education for deaf pupils was started in 1967, and the former types of further education were discontinued (Pärsson, 1997).

Today, the upper secondary education (gymnasieskolan) provides the same range of theoretical and vocational course programs to deaf and hearing pupils. Deaf pupils attend their own special classes in schools for hearing pupils (Pärsson, 1997) in the town hosting the Swedish National Upper Secondary School for the Deaf. This school receives pupils from all over the country.

Because of the recognition of Swedish sign language as an official language in 1981, new educational and occupational fields opened up for deaf people. People mastering sign language, both deaf and hearing people, were now sought after in visual media, in special education for the deaf, and in caring for children, adolescents, and elderly deaf people (Pärsson, 1997). It has now become an advantage to master the previously
unaccepted sign language, also for hearing people because there are employment positions for which sign language skills are in demand or are an advantage.

A growing number of occupations require higher education, and an increasing number of deaf people are reaching these levels. Many deaf people are pioneers in these new occupations (Backenroth-Ohsako, 2002). Deaf students are integrated with hearing students at universities in Sweden, and deaf students can choose freely among the courses offered. To study at a university, however, deaf students need access to sign language interpreters, and these are not always available. Even if a deaf person has been accepted into a university course, it is not always possible for them to take part in it owing to the lack of interpreters.

Summary

There are several differences between education for deaf and for hearing people. One difference is the time at which compulsory education was established. The right to education for hearing people was established in 1686 and was made a compulsory education in 1842. The corresponding compulsory education for deaf people was established 50 years later. The duration of compulsory education differs between deaf and hearing people. Basic education for deaf pupils has always been longer, but as of 1965, the difference is only 1 year.

Another difference is the educational focus. Education for deaf pupils has primarily emphasized vocational training, whereas education for hearing pupils emphasized theoretical training. Hearing pupils have previously had a greater number of opportunities and fields of study. When the compulsory 9-year comprehensive school started in 1965, education in special schools for the deaf became more like the education of hearing pupils—at least in terms of content. However, it was not until 1981, when deaf pupils received education in sign language, that they gained the same opportunities to assimilate their training. These two reforms were crucial in making education for deaf and hearing pupils formally equal.

With respect to further education, hearing people have been able to access education earlier than deaf people. Whereas hearing pupils have been able to make a choice between vocational and theoretical training, the content of further education for deaf pupils has focused on vocational training. Not until more recently has it been accepted that deaf people should be able to study areas with a theoretical orientation.

Over the years, education for deaf people has moved toward an equality with the education offered to hearing people. What is the significance of this in terms of the level of educational attainment?

Level of Educational Attainment for Deaf People

Although there are no statistics on the level of educational attainment for deaf people in Sweden, a few bodies have attempted to examine the issue. On several occasions, the Swedish National Upper Secondary School for the Deaf and Hard of Hearing has investigated the activities of their pupils after having completed school (Backlund, 2000; Högsten, 1989; Jonsson, 1995). The proportion of former pupils that went on to pursue higher education at a university varies between 8% and 24% in these follow-up studies. As these inquiries encompass both deaf and hard-of-hearing pupils, conclusions about deaf pupils cannot be drawn.

Another indication of the level of attainment is the Level-of-Living survey among deaf members and a few deaf nonmembers of the Swedish National Association of the Deaf aged 16–84 years. It reports that deaf people have a lower level of educational attainment than the rest of the population in Sweden (Swedish Research Institute for Disability Policy, 2005). Of 138 deaf members, 77% had an upper secondary school education and 10% had completed an academic education. Of the 79 deaf nonmembers, 80% had an upper secondary school education and 5% had completed an academic education. The results may be skewed because the average age among responders was 60 years. As the investigators suggest, it was not as common to pursue further education in the older generation as it is among younger people today.

A Danish study (Døves uddannelses- og arbejdsmarkedstilfælde, 2006) shows a lower level of educational attainment among deaf people compared to the rest of the population. This study included 2,244 deaf people aged 18–65 years and found that 53% had compulsory
comprehensive school as their highest level of educational attainment, as compared to 31% in the entire Danish population. The proportion that proceeded to advanced studies was 10% among deaf people and more than twice that among the hearing. Furthermore, more women than men had higher education among both deaf and hearing people. This research also indicates that more deaf people now proceed to advanced studies but that, at the same time, the percentage of deaf persons that at most have completed compulsory comprehensive school is increasing. The proportion of deaf people with an educational level between compulsory comprehensive school and advanced studies is thus decreasing over time.

A Finnish study (Lehtomäki, 2004) also found that deaf women have a higher level of educational attainment than deaf men, and this is particularly clear among younger people. Furthermore, participants in the study considered deafness to be the number one obstacle to further education. The explanation offered by Lehtomäki is that deaf people assume that success is prevented by deafness or that they reflect societal attitudes toward deafness as its being associated with a low level of knowledge. Such attitudes may provoke a sense of futility in even trying to reach higher levels of educational attainment.

An American study (MacLeod-Gallinger, 1992) indicates that, even though deaf women have higher levels of educational attainment than deaf men, more deaf men go on to earn a PhD. This and another American study (Barnartt & Christiansen, 1996) also confirm lower levels of educational attainment among deaf people, as compared to hearing people.

Research on changes in levels of educational attainment over time indicates that the proportion of people with high-level education has increased in the deaf population (Barnartt & Christiansen, 1996; Schroedel & Geyer, 2000). A comparative study carried out by Barnartt and Christiansen (1996) showed that the proportion of people with high-level education has increased in the deaf population and in the hearing population during the period 1972–1991. This increase was greater in the hearing population than in the deaf population, and accordingly, levels of educational attainment are still higher among hearing people than among the deaf. Only at the second highest level of educational attainment was a decrease in the difference between deaf and hearing people observed. It is also noteworthy that the difference between deaf and hearing men was larger than the difference between deaf and hearing women.

In summary, there is no research that has examined the levels of educational attainment among deaf people in Sweden. According to reports and inquiries from other countries, the levels of educational attainment among the deaf are lower than in the rest of the population and deaf women have higher levels of educational attainment than deaf men. Because of this lack of knowledge about levels of educational attainment of deaf people in Sweden and because of the educational reforms that have aimed to achieve equality in education for deaf and hearing pupils, it is important to investigate levels of educational attainment in deaf people.

**Aim and Research Questions**

This article aims to describe and analyze levels of educational attainment among people that have attended special schools for deaf people as compared to the rest of the population in Sweden.

- What are the levels of educational attainment in people who have attended special education programs for the deaf? Do their levels of educational attainment differ from the levels of educational attainment of the reference population and, if so, in what respect? What differences in terms of sex, age, and immigrant background are observed within and between the groups?
- Have differences in the levels of educational attainment changed over time and in connection with the main type of educational policy?
- Are there any covariations between the levels of educational attainment and sex, age category, and immigrant background, and if so, how can they be described?

**Methods**

**Participants**

The population consists of people born between 1941 and 1980 who attended special schools for the deaf in Sweden and/or the Swedish National Upper Secondary School for the Deaf. A total of 2,371 persons,
including their identification numbers, were located through school catalogues. In all, 227 of them were not included owing to incomplete identification numbers, death, or emigration from Sweden (for more information about the incomplete identification numbers, see Discussion—Limitations). The remaining population of 2,144 individuals is defined in this text as the deaf population. It constitutes a total population of all persons born between 1941 and 1980 having attended special schools for the deaf and/or the Swedish National Upper Secondary School for the Deaf. It does not, however, constitute a population of all deaf people in Sweden. In this article the deaf population is compared to a reference population of 100,000 randomly chosen individuals from the total population born between 1941 and 1980 and living in Sweden in 2005.

In addition, subjects in the deaf population had to be registered in the national population register in Sweden on the 31st of December 2005. Pupils from all the five special schools for deaf are included; however, pupils from schools for the deaf with additional impairments are excluded. None of the individuals in the deaf population received a cochlear implant at an early age.\(^3\)

Having attended special schools for the deaf and/or the Swedish National Upper Secondary School for the Deaf, people in the deaf population present with a congenital or early-onset deafness/hearing loss. The degree of the hearing loss is not known, and it is thus beyond the scope of this article to state whether people in the deaf population are audiologically deaf or not. It is also unknown whether people in the deaf population consider themselves to be culturally Deaf. Likewise, the level of knowledge in the deaf population of sign language is unknown. The oral method of education was prescribed at school for pupils born between 1941 and 1963, but according to sources, many of the pupils used sign language. Pupils born between 1964 and 1980 attended school at a time when the educational policy advocated sign language (sign language was recognized in 1981 in Sweden). In summary, the deaf population is heterogeneous in their communication method and degree of hearing loss, but they all demonstrate a hearing loss from an early age and attended a special school for the deaf. Therefore, the definition of deaf used in the present text is a person with a hearing loss from an early age attending a special school for the deaf.

There may be individuals in the deaf population that have particular difficulties or additional impairments. Individuals with additional impairments may also be included in the reference population. In follow-up studies made by the Swedish National Upper Secondary School for the Deaf, 14%–16% of their former pupils had additional impairments (Backlund, 2000; Högsten, 1989; Jonsson, 1995). A study of pupils from special schools for the deaf in Sweden (The National Agency for Special Schools for the Deaf and Hard of Hearing, 2001) showed that 30% required additional support and, according to a follow-up study some years later, this percentage increased to 40% (Hendar, 2005). A comparably large proportion of deaf people are considered to have additional difficulties, which is not unique to Sweden. National statistics from the United States indicate that the percentage of the deaf or people with hearing loss that have additional impairments varied between 29% and 39% during the period 1977–1997 (Holden-Pitt & Diaz, 1998).

Materials
Data for this article are taken from the “Integrated database for labor market research” (a database at Statistics Sweden) and consist of information on education, employment, and income. The data are registered information from the year 2005. Ethics approval of this study was granted by the Regional Ethics Board in Uppsala (Sweden).

Analyses were made with the following variables: age, sex, immigrant background, and level of educational attainment. The immigrant background variable is divided into five subgroups according on the location of birth of the participant and his/her parents (Sweden or abroad).\(^4\) The subgroups are (a) born abroad with both parents born abroad, (b) born in Sweden with both parents born abroad, (c) born abroad with at least one parent born in Sweden, (d) born in Sweden with one parent born in Sweden and one parent born abroad, and (e) born in Sweden with both parents born in Sweden.
Another variable, level of educational attainment, is defined as the highest level of education that a person has completed. It is divided into three subgroups (if not otherwise stated): (a) upper secondary education, (b) postsecondary education of 2 years at most, and (c) postsecondary education of at least 3 years (including postgraduate studies).

Procedure

Analysis of frequencies, cross tables, and logistical regression were done using the Statistical Package for the Social Sciences. For the logistical regression analysis, the Akaike information criterion (AIC) was used to determine which combination of variables (sex, age category, and immigrant background) fit the data in the best way (Hair, Anderson, Tatham, & Black, 1998). The combination of variables displaying lowest AIC indicates the best model.

A margin of error was calculated for the results concerning the reference population, which consists of a random sample of the total population in Sweden. At most, the margin of error was 0.5% (level of confidence 99.9%). Because of this and the fact that the reference population is a large and randomly chosen sample, the results can be generalized to the total population in Sweden—about 9 million people (Statistics Sweden, 2007). Because the deaf population is a total population and the reference population is a large random sample, all the differences presented in this text are significant at the 99.9% level of confidence.

There is a small amount of missing data on the level of educational attainment (0.6% in the deaf population and 1.2% in the reference population). The level of educational attainment in these individuals is not known by Statistics Sweden. This may be due to studies abroad and therefore a lack of registration of the level of education in Sweden.

Results

Level of Educational Attainment (Highest Level of Education Achieved)

The level of educational attainment in the deaf population is lower than in the reference population. In the deaf population, only 5% completed at least 3 years of postsecondary education, as compared to 21% in the reference population (see Table 1). This is the requirement in Sweden for achieving a university degree. Furthermore, upper secondary education (as the highest level) is completed by 87% in the deaf population as compared to 65% in the reference population.

Women have a higher level of educational attainment than men in the deaf and the reference populations. Patterns in the deaf population are similar to those in the reference population, with the differences between women and men being slightly smaller in the deaf population (see Table 1).

Another evident pattern in the two populations is age. Higher levels of educational attainment are more common among younger people than older (see Table 2).

There were no differences in the deaf population in immigrant background owing to the small number of people in the various subgroups. When the subgroups are regrouped into two groups—one consisting of people born in Sweden with both parents also born in Sweden and the other consisting of people with an immigrant background (the four remaining subgroups)—the outcome in the deaf population is that the percentage with a postsecondary education of at least 3 years is slightly higher in the group with an immigrant background, and conversely, the percentage of upper

<table>
<thead>
<tr>
<th>Highest completed education</th>
<th>Deaf population</th>
<th>Reference population*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>Upper secondary education</td>
<td>88</td>
<td>84</td>
</tr>
<tr>
<td>Postsecondary education, 2 years</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Postsecondary education, at least 3 years</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Total (%)</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total (n)</td>
<td>1,132</td>
<td>1,000</td>
</tr>
</tbody>
</table>

*The margin of error was 0.3%–0.5% (level of confidence 99.9%) for the results of the reference population.
Secondary education is slightly lower. No differences were observed between people with an immigrant or Swedish background in terms of level of educational attainment (the highest level of education achieved) in the reference population.

The results clearly demonstrate a difference in level of educational attainment—the deaf population displaying lower levels than the reference population. In the populations, patterns in terms of educational attainment in subgroups according to sex and age, respectively, are similar.

Differences in Level of Educational Attainment Over Time

A potential increase or decrease in the level of educational attainment (the highest level of education achieved) was explored by comparing the level of educational attainment in age categories. Levels of educational attainment in four age groups (25–34, 35–44, 45–54, and 55–64 years) in the deaf population are presented as an under- and overrepresentation in comparison with the reference population. The comparison is made on the basis of the reference population through the relative risk reduction (RRR) \( (P_1 - P_2)/P_1 \) (Swinscow & Campbell, 2002). For example, Table 2 shows that 78% of the deaf population, 25–34 years old, has an upper secondary education and that the corresponding percentage is 57% in the reference population. The RRR is, thus, 37% \( (78 - 57)/57 = 0.37 = 37\% \). Because the baseline risks are not similar, that is, different age categories are compared, the RRR is used.

**Upper secondary education.** There was a greater discrepancy between the proportion of the deaf population and the proportion of the reference population with upper secondary education. The overrepresentation of the deaf population with upper secondary education as the highest completed education increased when the four age categories were examined, starting with the oldest age group (see Table 3). Indeed, the percentage of the deaf population with upper secondary education decreased in a comparison of older and younger people in the deaf population (Table 2), but this is demonstrated to an even greater extent in the reference population, which results in an increased difference (RRR) between the two populations (Table 3).

**Postsecondary education, 2 years.** The difference (RRR) between the deaf and the reference populations in the percentage with a postsecondary education of 2 years is 64% among the oldest age group but only 7% among the youngest (see Table 3). It is concluded that great changes took place over the course of time in the level of educational attainment. The deaf population is underrepresented but is close to the reference population.

**Postsecondary education, at least 3 years.** The differences (RRR) in the highest level of educational attainment are similar in the deaf and reference populations in the oldest and youngest age groups (see Table 3). Although there is a decreasing difference (RRR) in the
three younger age groups (45–54, 33–44, 25–34), the deaf population is still underrepresented in comparison with the reference population.

In summary, the level of educational attainment increases in the deaf population and to an even larger extent in the reference population. A difference between the two populations is thus maintained. The deaf population, however, approaches the reference population in terms of level of educational attainment with respect to postsecondary education of 2 years.

Level of Educational Attainment and Educational Policy

Swedish sign language was recognized as an official language in 1981, with a bilingual educational policy being adopted at the special schools for the deaf. As a consequence, those born between 1964 and 1980 attended school when the sign language educational policy was in effect. Pupils born between 1941 and 1963 attended school during the previous period of oral educational policy. These two groups are compared in the deaf and reference populations through the RRR, and the results are given in Table 4, which shows differences (under-/overrepresentation) in the level of educational attainment (the highest completed education). Differences (RRR) increased in an examination of the upper secondary level and decreased in an examination of the higher educational levels.

Covariation of Some Variables With Level of Educational Attainment

Logistical regression analysis was used to investigate whether any of the variables (sex, age category, immigrant background) separately or together covaries with the level of educational attainment. The variable, level of educational attainment, was dichotomized with low educational level representing upper secondary education as the highest completed education and high educational level representing all education on levels above the upper secondary education. The variable of type of population (deaf population/reference population) was also included.

The analysis indicates that neither sex, age category, nor immigrant background differs in the two populations (see Table 5). The covariation is similar in the two populations. In other words, the level of educational attainment cannot be explained by any of the three variables, as the relationship between sex and level of educational attainment, for example, is similar in both populations.

Discussion

Limitations

This article is based on data from the national database register, which means that large rates of nonresponse, common when sending out questionnaires, can be avoided. The database approach used in the study also offers the opportunity to construct a reference population for analytical purposes and sets the stage for
future longitudinal studies as the “integrated database for labor market research” is updated yearly. On the other hand, data are originally gathered and registered for reasons and in manners that are out of the control of researchers, implying risks of unknown errors in the data sets.

In registering identification numbers from pupils’ catalogues of special schools, errors could have occurred or individuals could have been missed altogether. Registration was carried out through the catalogues issued every second year to minimize the risk of errors in the registration of identification numbers. Some identification numbers were incomplete and had to be completed through the population register; name and date of birth were used to find the right person. Duplicates were rare and in a few cases people with strong relations to the Swedish deaf community assisted in finding the correct person. The risk of not having identified the correct person is estimated to be very low.

We have no knowledge, as mentioned previously, of whether the individuals in the deaf population in this article are audiologically and/or culturally deaf. Therefore, persons with different degrees of hearing loss and persons who do not consider themselves to belong to the deaf community may be included in the deaf population. However, this article does not make these criteria an issue of inclusion; inclusion rather depended upon whether the individual had attended a special school for the deaf.

**Table 5** Results of the logistical regression

<table>
<thead>
<tr>
<th>Variables</th>
<th>Odds ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (Female)</td>
<td>1.000</td>
</tr>
<tr>
<td>Male</td>
<td>0.751***</td>
</tr>
<tr>
<td>Age categories</td>
<td></td>
</tr>
<tr>
<td>(55–64 years)</td>
<td>1.000</td>
</tr>
<tr>
<td>25–34 years</td>
<td>1.962***</td>
</tr>
<tr>
<td>35–44 years</td>
<td>1.492***</td>
</tr>
<tr>
<td>45–54 years</td>
<td>1.294***</td>
</tr>
<tr>
<td>Immigrant background</td>
<td></td>
</tr>
<tr>
<td>Born in Sweden with both parents born abroad</td>
<td>1.000</td>
</tr>
<tr>
<td>Born abroad with both parents born abroad</td>
<td>0.945**</td>
</tr>
<tr>
<td>Born in Sweden with both parents born abroad</td>
<td>0.812***</td>
</tr>
<tr>
<td>Born abroad with at least one parent born in Sweden</td>
<td>1.660***</td>
</tr>
<tr>
<td>Born in Sweden with one parent born in Sweden and one parent born abroad</td>
<td>0.996</td>
</tr>
<tr>
<td>Type of population</td>
<td></td>
</tr>
<tr>
<td>Deaf population</td>
<td>0.285***</td>
</tr>
<tr>
<td>Constant</td>
<td>0.454***</td>
</tr>
</tbody>
</table>

Reference categories are given within parentheses. **p < .01. ***p < .001.

Reflections on the Results

After a number of educational reforms, education for the deaf and the hearing is formally equivalent in Sweden. What has been the impact of these reforms on the level of educational attainment for deaf people? In accordance with previous research studies (see, e.g., Barnartt & Christiansen, 1996; Schroedel & Geyer, 2000), the results of this article demonstrate that the level of educational attainment of deaf people has risen. In comparison with a reference population, the level of educational attainment of the deaf population is however—as before—lower, which has also been demonstrated in other studies (Barnartt & Christiansen, 1996; Døves uddannelses- og arbejdsmarkedssforhold, 2006; MacLeod-Gallinger, 1992; Swedish Research Institute for Disability Policy, 2005). This result—that is, that the disparity between deaf and hearing has not altered—can be traced to the comparably larger increase in the proportion of people with a high educational level in the reference population and parallels the conclusions of the study of Barnartt and Christiansen (1996).

The results of the study of Barnartt and Christiansen (1996) additionally indicate that differences in the level of educational attainment between the two populations have decreased only on the second highest level, which was also found in the research presented here. One reason for this decrease may be that education on this level has become a frequent option in the deaf population although people in the reference population now more often aim at an academic education of at least 3 years. An additional reason could be that the duration of education in special schools for deaf pupils in Sweden is extended as compared to other schools. Therefore, the young cohort of deaf persons in this article may still be studying to attain higher levels of education.
A result in this article that has not been demonstrated in other studies is that the deaf population displays the same pattern of level of educational attainment as the reference population with respect to sex and age categories—women have a higher level of educational attainment than men and younger people have a higher level of educational attainment than older people.

During the sign language educational policy period (based in this article on the year of birth of the pupils), the difference between the deaf and hearing with upper secondary education has increased and the difference between the deaf and hearing with higher education levels has decreased. The level of educational attainment for deaf has increased in general during this period, but differences in level of educational attainment between the deaf population and the reference population are still apparent. The conclusion is that educational policy concerning the communication mode in the classroom does not seem to have had a straightforward impact on differences in level of educational attainment between the deaf and the reference population.

The results of the study furthermore reveal that neither sex, age category, nor immigrant background statistically explain the differences in the level of educational attainment between the deaf and hearing populations. Other circumstances could certainly influence educational attainment and will be discussed below.

Communication between teachers and pupils is of course basic to the teaching and learning processes. Teachers having Swedish as their first language might not have the same standard in sign language as deaf pupils having sign language as first language. Such teachers may consequently have difficulties in explaining complex contexts in sign language and also in comprehending what their pupils express in sign language. If communication between teacher and pupil does not work properly, the pupil will most certainly encounter difficulties in taking in the education offered (Statens Offentliga Utredningar, 1996; The Swedish National Agency for Education, 1996). To ensure that all teachers, which use sign language in the classroom, have a satisfactory level of knowledge in sign language, recently, suggestions have been made that special schools have to provide sign language instruction for their teachers (Hendar, 2008).

Level of knowledge is crucial to any option of further education. The rate of pupils that leave the Swedish special school for deaf persons with complete final grades is reported to be low (Hendar, 2008; Ministry of Health and Social Affairs, 2003), which negatively affects the possibility for upper secondary education. Moreover, the level of knowledge in general among deaf pupils as compared to hearing pupils in upper secondary education is also low (The Swedish National Agency for Education, 1996). Deaf people may furthermore lack sufficient knowledge of the Swedish language, as Swedish is their second language. A Swedish report (Hendar, 2008) confirms that pupils in the special schools for deaf have lower grades in the Swedish language than pupils in other schools. Good knowledge in the Swedish language is a requirement to continue to higher education, and therefore, this may also be a factor that influences the level of educational attainment.

Social context is also central when discussing educational attainment. Some aspects of social context will be addressed here.

Because the Swedish National Upper Secondary School for the Deaf exists in one town only, many of the deaf pupils have to move away from their parental home to attend school. Because of this, deaf pupils might experience greater changes (new town, new lodgings, new friends, and parents at a distance) beginning upper secondary education than hearing pupils who typically continue their education in their hometown and family environment. The deaf teenagers might in such circumstances sometimes give priority to social life over studying (Norberg, Yström, & Brunnberg, 2008).

Low expectations from persons in the surroundings may furthermore have an impact (this was found to be the case in hard-of-hearing students; Danermark, Antonson, & Lundström, 2001).

Parental income and social class have been found to have an impact on hearing children’s results in school (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Haveman & Wolfe, 1995; Statistics Sweden, 2005), but there is nothing indicating differences in these respects when it comes to deaf children.
Consequently, such mechanisms will probably not influence the differences in level of educational attainment between the two populations.

**Additional difficulties.** Large proportions (30%–40%) of deaf pupils are assessed to have additional difficulties that may require specific supportive measures. These pupils, perhaps, do not receive the appropriate support in school to overcome the difficulties or to pursue advanced schooling, and a number of the pupils may have such significant additional difficulties that postsecondary education is not an option. Indeed, pupils with additional difficulties are included in the reference population as well—for example, 5%–10% in Sweden have dyslexia (Sterner & Lundberg, 2002)—but the very large proportion of deaf pupils with additional difficulties could be one factor (although difficult to estimate) behind differences in level of educational attainment between the deaf and hearing populations.

**Conclusions**

The level of educational attainment among deaf people has increased over time in Sweden. However, at the same time, the level of educational attainment for hearing people has increased even more. In spite of reforms in Sweden to make education of deaf persons equal to education of other persons, deaf people do not obtain the same level of education as other citizens. The educational reforms implemented in Sweden are without doubt necessary to raise the educational level of deaf people but, as shown in the study reported here, such measures are not sufficient for deaf people to attain the same level of education as the rest of the population. Other circumstances, which may influence the level of educational attainment, such as communication in the classroom, level of knowledge, social context, and additional difficulties could contribute to the persistent difference. Further research into these and other conditions and mechanisms that seem to be of importance to educational attainment in the deaf population is necessary.

**Notes**

1. Before 1889, it was not a matter of course that deaf people should have an education, but a couple of separate schools for deaf existed and some deaf attended them (Parsson, 1997).

2. A national school for deaf with additional impairments also existed. As the study reported, it does not focus people with additional impairments. This school will not be further discussed.

3. Implantation of cochlear implant on deaf children started at the end of the 1980s in Sweden (C. Möller, personal communication, October 26, 2007).

4. The categories are predetermined by Statistics Sweden.

5. Postgraduate studies are included in this category because the number in 2005 of deaf people that has completed postgraduate studies is too small to present. In the reference population, the percentage is 1.1%.

6. The Swedish “personnummer,” consisting of year, month, day of birth, and a four-digit code.

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