The Employment Effect of Immigrants' Language Proficiency[1]

Marie Louise Schultz-Nielsen
Rockwool Foundation Research Unit
and Aarhus School of Business

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Abstract

In this study I analyze what determines immigrants' language proficiency and to what extent proficiency in the host country language has an effect on the employment probability. The employment effect of language estimated by OLS may be biased for several reasons. Unobserved heterogeneity may bias the result in any direction whereas measurement error in the language proficiency variable will tend to bias the estimates downwards. I address these problems by using pararallel surveys among immigrants in Germany and Denmark. In the Danish case where the data is particularly rich I also address the causality problem that may occur if language proficiency is improved by being in employment.

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1 Introduction

The purpose of the study is to determine the effects of immigrants language proficiency on their employment prospect. Language skills might be important for many reasons, but one of the central questions in relation to integration of immigrants is: To what extent do better language skills help you find a job? This is first of all important for the immigrants who arrive in a country and have to decide how much effort they should put into learning the natives language. But secondly it is of great importance for governments who uses substantial amounts spent on language courses to improve the language skills of newly arrived immigrants.

Even though the topic is important the number of studies of the subject is rather limited. First of all one needs information about language skills. The main problem is, however, that even when this information is available and the correlation between language skills and labor market behavior can be established, this correlation cannot be interpreted as the causal relationship between language abilities and performance on the labor market. As pointed out by Borjas (1994), the positive correlation between language abilities and earnings which has been found in a number of studies, could be upward-biased simply because immigrants that in general have better abilities are also more likely to gain higher wages and have good language skills. But it could also be downward-biased if those immigrants that do not learn the host country language is doing relatively better on the labor market without these skills than those immigrants, who actually learn the host country language, see Willis and Rosen (1979). A further complication, as pointed out by Dustmann and Soest (2001), is that the assessment of the language abilities may suffer from substantial measurement error. To solve the problem with language abilities being endogenous Chiswick and Miller (1995) have proposed a model that determines language proficiency using an instrument variable (IV) approach. Dustmann and Soest (2001) and Dustmann and Fabbri (2003) show that the upward bias from endogeneity can be more than overruled by a downward bias due to measurement errors. In this paper I address these problems using a new unique survey that allows us to apply both IV and matching in a comparative study of Germany and Denmark, as well as panel data approaches when studying the situation in Denmark in isolation. The survey was conducted in Germany and Denmark in parallel and covers some of the largest immigrant groups in both countries, including people from Turkey, the former Yugoslavia, Poland, Iran and Lebanon (see Tranæs and Zimmermann, 2004). This rich dataset contains information on both self-assessed language abilities and the interviewers assessment of the respondents language abilities and a wide range of other variables including parental background. Approximately 3,500 and 5,500 were interviewed in Denmark and Germany respectively. Subjects were interviewed in Germany in 2002 and in Denmark in 1999 and 2001. In the Danish case data are particularly rich. First of all because the same individuals were

interviewed twice, secondly, because it is possible to follow the subjects through the use of register data before and after. This enable us to control for unobserved heterogeneity but also to deal very directly with the endogeneity problem by concentrating on the relationship between individuals language abilities (and changes in language abilities) prior to any employment in Denmark and their subsequent employment as they enter the labor marked.

The paper is organized as follows. In section 2 the existing literature is discussed. The analytical model is presented in section 3. The data includes two surveys and they are described in section 4. The empirical results are presented in section 5 and the conclusion follows in section 6.

2 Previous Research

Proficiency in the host country language is one of the very important skills immigrants can obtain. If the language spoken in the host and home country is the same then of course this will not be a problem. Immigrants often have been attracted to areas where the home country language is spoken. But it is far from always that an immigrant speaks the host country language upon arrival. In small language areas (like the Scandinavian countries) it is hardly ever the case.

As noted by Chiswick and Miller (2007) the story of the Babel-tower shows that the recognition of the importance of language abilities for labor market productivity has a very long history. In a more narrow economic context the importance of acquiring country specific human capital skills for the immigrants labor market performance has been known at least since the seminal work by Chiswick (1978), who identified the importance of duration of residency on immigrants earnings. This article has received much attention also due to the later criticism by Borjas (1985), who pointed out the possible importance of cohort-effects.

The first study (to my knowledge) of the importance of language proficiencies for the labor market performance is Carliner (1981). Like most of the later studies, he investigates the relation between language skills and earnings. He calculates the wage differences between several language groups in Canada. He finds that men who only speak English earn the most, but also finds that there is a wage premium for non-native English-speaking to learn English. In the French-speaking parts of Canada there is also a wage premium to learn French.

McManus et al. (1983) analyse the English proficiency and earnings among Hispanic males in United States. They find that English proficiency increases the younger the immigrant was upon arrival, with schooling (in the U.S.) and number of years in the U.S. The study also finds that a great deal of the wage differences between Hispanic and Anglo Americans can be explained by differences in English skills.

Grenier (1984) also investigates the relation between the language skills and earnings

among Hispanic-American males. He finds that (omitting correlated variables like place of birth and years spent in the U.S,) one third of the wage differences between Hispanic and Anglo-American males can be explained by language skills. Chiswick (1991) later note that there is a specification error in these estimates, but concludes that the one third of the earnings differential is in line with other American studies including Reimers (1983), Chiswick (1987), Kossoudji (1988), Tainer (1988) and Rivera-Batiz (1989).

Chiswick (1991) is the first to take special interest in the difference between speaking and reading abilities. He concludes that reading fluency is more important for immigrants earnings than speaking fluency. A similar result on German data is found in Dustmann (1994).

As pointed out by Borjas (1994), the positive correlation between language abilities and earnings, which has been found in many of the former studies, might very well be biased due to endogeneity problems.

One part of the problem is unobserved heterogeneity or omitted variable bias. That is, if the outcome (earnings or employment probability) is explained by a number of characteristics and you lack information about (at least) one of them. Then if the characteristic, i.e. abilities, which you lack information about, is correlated with language fluency, then the estimated parameter for language becomes biased. This problem is a parallel to measuring the return to schooling where the acquired level of schooling is often supposed to be correlated with other abilities, see Card (1999) for an overview.

Another part of the problem, which I will return to later, is that being on the labor market might improve your language fluency. In that case the causality is reversed, as it is not the language skill that improves the labor market performance, but attending the labor market that improves the language skills.

The problem of endogeneity between earnings and language is addressed in the seminal article by Chiswick and Miller (1995). They discuss what determines language proficiency and how to deal with the endogeneity. In order to determine what is important for immigrants proficiency in the host country language, they propose a theoretical model, where language skills are determined by three sources: Exposure to the language, efficiency in second language acquisition and economic benefit from language fluency.

To explain immigrants language proficiencies in the empirical part of the study they list a range of characteristics they would like to have information about. First of all they would like to know the immigrants expected wage increment for language fluency, duration of residency in destination country, expected future duration destination language instruction and educational level. Characteristics they all expect to have a positive effect on language fluency. While they expect higher minority language concentration, linguistic distance between home and host country language, age at migration and being a refugee, to have negative impact on language fluency. Being married to a countryman is also expected to have negative effect on the language skills. Chiswick and Miller (1995) would

also like to know how many children the immigrants have, but expect the influence on the parents language proficiency to be ambiguous. On the one hand having children might be a natural way of getting in contact with natives (via schools etc), on the other hand children can become translators for their parents making it less important for the parents on learn the host country language.

These pieces of information are not all available in the datasets that are used in the study. Instead language proficiency is explained by: Education, age, years since migration, married, married overseas, children, urban location, rural location, minority concentration and birthplace.

To deal with endogeneity Chiswick and Miller (1995) use the instrument variable (IV) approach with birthplace, the concentration of own ethnic minority at birthplace and if one is married overseas as instruments. These instruments turn out to be somewhat weak, but the methodological approach is very appealing.

Another way of dealing with endogeneity is shown by Dustmann & Fabbri (2003), who examine the language proficiency and labor market performance of immigrants in the UK. Their purpose is to investigate the causal relationship between immigrants English proficiency and their employment and earnings.

Like Chiswick and Miller (1995) they see learning a foreign language as an investment that depends on the potential future economic benefit, the exposure to the language and the efficiency in second language acquisition. And they start by estimating the language ability as a function of sex, age, years since migration, education (in host/home country), number of children, married, country of origin and ethnic concentration in neighborhood.

I will return to their model in a moment, but the main idea is to use a matching procedure to deal with the unobserved heterogenity, and then use the instrument variable approach to correct for the measurement error in the language proficiency variable.

Their overall result is that taking care of unobserved heterogenity in the earnings and employment regression leads to a substantially lower estimate than the traditional OLS-estimation would lead to. But this downward bias in the estimate is more than overruled if one also takes the measurement error of the language variable into account.

This result is in line with Dustmann and Soest (2001, 2002), who on basis of the GSOEP (German Socio-Economic Panel) estimate the effects of language proficiency on earnings for immigrants from Turkey, Yugoslavia, Italy, Greece and Spain. They use panel data and develop a model that enables them to divide the effect of the measurement error into a time-persistent and a time-varying component.

Until know the Danish evidence on the subject has been limited. Constant and Schultz-Nielsen (2004a, 2004b) estimate the effect of immigrants language proficiency on employment and earnings in both Germany and Denmark, but they do not address the unobserved heterogeneity or the measurement error. In general information about immigrants language proficiency is only available in very few Danish studies. And these studies do

not estimate the effects on the labor market behavior. There are a number of studies that do concentrate on immigrants labor market outcome like Husted et al. (2001), Jensen (2003), Nielsen et al. (2003) and Nielsen et al. (2004), but these studies are based on administrative registers that do not contain information about language proficiency.

3 The model

The econometric approach used in this analysis is very much similar to the one used by Dustmann and Fabbri (2003), who examine the causal relationship between language proficiency and labor market performance of immigrants in the UK. They address two sets of problems in their study, firstly the endogeneity between language and labor market performance and secondly the impact of measurement problems on the language variable.

Dealing with the endogeneity problem has been widely discussed in the evaluation literature. Potentially every person (i) can here occupy one of two potential states: $D = 1$ if the person is treated (takes part in the program) and $D = 0$ if not. These two states let to the potential outcome: y_i^1 if the person is treated and y_i^0 if not. The same theoretical framework can be adopted where looking at immigrants language abilities. Participating in a program is here equivalent to learning the host country language. To follow the notation of Dustmann and Fabbri (2003) we let $l_i = 1$ in the situation where the immigrant learns the host country language, and otherwise $l_i = 0$.

As noted earlier the outcome I will focus on is employment probabilities. One could here be interested in several different effects of learning a language. One effect could be the average treatment effect (ATE), measuring the average employment change for immigrants if they learn the language. Another effect could be the average treatment effect on the non-treated, measuring the change in employment if immigrants, who have not learned the language, actually did.

What I will focus on is how the employment probability changes with language abilities for those immigrants who have in fact learned the language. This measure is widely known as the average treatment effect on the treated (ATT) and can be written as:

$E(y_i^1 - y_i^0 | l_i = 1)$

Where;

$l_i = 1$ reefers to immigrants who have learned the host country language.

y_i^1 is employment probability if the immigrant speaks the host country language.

y_i^0 is employment probability if the immigrant does not speak the host country language.

$E(y_i^0 | l_i = 1)$ is the employment probability/earning for immigrants who speak the host country language, had they not spoken it. Obviously this value is unknown. But the problem becomes much easier to solve if one can assume conditional independence, that is: $E(y_i^0 | x_i, l_i = 1) = E(y_i^0 | x_i, l_i = 0)$. The identification assumption is that it is possible to find a vector of variables x, which possesses the necessary information to control for

omitted variable bias. And in that case the effect of language proficiency for immigrants employment and earnings can be calculated as:

$E(y_i^1|l_i = 1, x_i) - E(y_i^0|l_i = 0, x_i)$

One way of controlling for differences in x_i is to use matching. As the number of observations is limited I will do the match by using the propensity score. The method is based on the work by Rosenbaum and Rubin (1983) who shows that the conditional independence assumption remains valid if the match is done on basis of the propensity score $p(x_i)$ instead of x_i.

To deal with the measurement problem I follow Dustmann & Fabbri (2003) and use an instrument variable approach. The basic idea is to find an instrument (I_i) that is correlated with the true language abilities, but not with the measurement error. I use whether or not the immigrant has been interviewed in the host country language as an instrument and I will return to a discussion of this instrument later. Given the above mentioned assumptions it is possible to calculate an estimator that corrects for the omitted variable bias by using matching and the measurement error by the IV-approach:

$$\gamma^{MI} = \frac{E(y_i^1|I_i=1,x_i) - E(y_i^0|I_i=0,x_i)}{\Pr(l=1|I_i=1,x_i) - \Pr(l=1|I_i=0,x_i)}$$

The intuition is that the difference in the nominator shows the difference in employment-probability for similar immigrants just having different language skills. Unfortunately these skills are not measured precisely. Therefore the denominator (less than 1) calculates how much the measured language skills increase when the instrument (being interviewed in the host country language) changes from zero to one.

4 The Data

The primary sources of information are surveys carried out in Denmark and Germany. I shall refer to them as the Rockwool Foundation Migration Survey Denmark/Germany (RFMS-D/RFMS-G). These surveys are made in collaboration between the Institute for the Study of Labor (IZA) in Germany and the Rockwool Foundation Research Unit (RFF) in Denmark. The surveys are based on a similar questionnaire with detailed questions concerning living and working conditions of immigrants in Denmark and Germany. RFMS-D and RFMS-G cover some of the biggest immigrant groups in both countries.

4.1 The Danish data: RFMS-D

The Danish data (RFMS-D) consist of two surveys conducted in 1999 and 2001, involving 3,615 (1999) and 3,262 (2001) immigrants and their descendants from eight non-Western immigrant groups. These were selected among the largest groups of immigrants and their descendants in Denmark, including people from the former Yugoslavia, Iran, Lebanon,

Pakistan, Poland, Somalia, Turkey and Vietnam. Immigrants from these countries account for approximately two thirds of all non-Western immigrants in Denmark around 2000. The RFMS-D includes not only foreign citizens, but also persons with foreign background who have acquired Danish citizenship.

In Denmark, every person (except asylum seekers) residing legally in the country obtains a social security number and is registered in the Danish Central Person Register (CPR). Therefore it was possible to draw the Danish sample from 1999 randomly from the CPR. The sample was restricted to persons who had lived in Denmark for at least two years and were between 16 and 70 years old. In 2001 the respondents were contacted once again and 2,348 re-interviewed. This sample was supplemented with 914 new persons. However, there seems to be serious problems related to the interviewers' language assessment among these new persons the values are simply not credible, and I shall only consider the re-interviewed in 2001 in this paper.

The RFMS-D was carried out by Statistics Denmark, which used a special immigrant staff, that enabled the respondents to choose the language to be interviewed in. But every interview was started in Danish in order to give the interviewer an impression of the respondents language skills. Afterwards the RFMS-D has been merged with register information available at Statistics Denmark. These registers contain information about the respondents age, marital status, income on personal level and household level. Furthermore information about neighborhoods has been added.

The response rate in the 1999 sample was 57.8 percent and 74.3 percent among the re-interviewed in 2001. This response rate is not high compared to surveys in general in Denmark. The main reason for the non-response was that it was harder to obtain the immigrants telephone numbers, mainly due to the fact that immigrants more often have (changing) mobil numbers and have names that are misspelled at the telephone company. In comparison another Danish survey among immigrants, Togeby and Møller (1999), had a response rate of 48.2 percent.

In order to check whether our sample is a representative sample of the immigrants in Denmark, I have examined to what extent the distribution of the immigrants in the survey is the same as for all immigrants in Denmark registered in the CPR from the eight countries mentioned previously. The comparison is made on the basis of a number of central background variables including sex, age, geography and employment.

The analysis of representativeness shows that the sex-age distribution in general is very much the same among immigrants in the surveys in and the CPR. But 40- to 49-year-olds are slightly over-represented in the RFMS-D (18.4 % among respondents in 1999 against 17.1 % in the CPR). The age-region distribution is in general very similar in the RFMS-D and in the CPR. But dividing Denmark into three regions (the Metropolitan area, the rest of the islands, and Jutland) there are fewer immigrants in the survey (50.6 % in 1999) that comes from the Metropolitan area than in the CPR (54.4 %) and accordingly more

in the other regions. With respect to the employment situation the RFMS-D seems very representative. But in 2001 there is some over-representation of employed immigrants among the re-interviewed.

Even though there are some minor differences between the immigrants in the RFMS-D and in the CPR especially concerning region and employment the RFMS-D appears to be quite representative and give very substantial knowledge about the non-Western immigrants in Denmark.

See Nielsen and Pedersen (2000) and Bauer and Nielsen (2004) for a more in-dept description of the RFMS-D.

4.2 The German data: RFMS-G

The German dataset (RFMS-G) collected in 2002 includes 5,569 foreign citizens from Turkey, the former Yugoslavia, Poland, Iran, and Lebanon living in Germany. These five nationalities represented approximately two thirds of the foreign non-Western population in Germany in 2001.

Although the RFMS-G is inspired by the Danish survey some adjustments have been made. First of all, the German sample only includes foreign nationals, because it was impossible to draw a random sample that included naturalized foreigners. Secondly, the RFMS-G contains questions mainly about the household composition and income that in the RFMS-D is known from the administrative registers. Thirdly, some questions have been changed due to institutional differences between Denmark and Germany.

The RFMS-G was carried out by Infratest Sozialforschung (now TNS Infratest). The interviews were carried out as face-to-face interview in the respondents home using a laptop. The interviewer tried, as a starting point, to carry out the interview in German, in order to evaluate the language skills of the respondents. In the cases where the respondent had difficulties understanding German, the interviewers had hard copies of the questionnaire in Turkish, Serbo-Croatian, Polish, Farsi, and Arabic that they could show the respondent. In addition, an interpreter could help to overcome language problems.

The sample design of the German survey is somewhat different from the Danish due to the limited possibilities of obtaining register-information in Germany. Mainly because the amount of information in these registers is more limited, but also because the access restrictions are severe.

In Germany each legal resident is registered at the local Einwohnermeldeamt. Infratest Sozialforschung contacted Einwohnermeldeämter in the 100 largest communities in former West Germany and the three largest in former East Germany. On the basis of the number of foreigners in the 103 communities 500 sample points was randomly distributed. Each sample point should obtain 11 interviews, so the total number of interviews should be about 5,500 with 1,100 from each of the five nationalities. Because of the random sampling procedure the number of sampling points became very high in some places like Hamburg

and West Berlin. To avoid clustering effects and also due to practical reasons, some of the sampling points from these places were moved to other communities. The final sample contains interviews with immigrants from 72 communities.

The response rate was 43.5 percent. This is somewhat lower than in RFMS-D, but compared to other German surveys it seems reasonable. The German ALLBUS (Allgemeinen Bevlkerungsumfrage der Sozialwissenschaften) among native Germans for example had a response rate in 2000 of 47 percent. The same year the new immigrant panel (F) in the German Socioeconomic Panel (GSOEP) had a response rate of 51, see von Rosenbladt (2001).

The main concern is of course still if the sample is representative of the five immigrant groups. As in the Danish case this has been checked by comparing the distribution by the central parameters sex, age and country of origin in the survey with the best available administrative register. Register information is obtained from the Ausländerzentralregister (AZR) that covers all foreign citizens in Germany. Unfortunately this information is not fully reliable, mainly because some foreigners do not de-registrate when they leave Germany again. This is especially a problem when people only stay for at short period and then leave again. This is often the case for many Polish males that comes to work in Germany for a short period. In the comparison between the distribution in the RFMS-G and in the AZR we find that Polish males with shorter duration of residence are generally under-represented. But as mentioned this might in reality not be a problem in the survey, but rather at the AZR.

The representativness of the RFMS-G is also checked with respect to the distribution by region. This analysis shows that immigrants from North Rhine-Westphalia are over-represented, especially for immigrants from Lebanon, where 50 percent of the interviews comes from this region against 31 percent in the AZR. As the North Rhine-Westphalia is an urbanized area and the sample is drawn among immigrants in the 103 biggest cities this does not come as a great surprise. The overall conclusion is that the only other way in which the sample is biased is in the dimension of polish mentioned above. Apart from that the representativness seems to be good, but one needs to remember that the sample is drawn among immigrants from five specific nationalities in the 103 biggest cities.

For a more in-dept description of the data in the RFMS-G, see Bauer and Nielsen (2004).

4.3 Important characteristics of the two populations

In the following is given a short description of the contents of the RFMS-D and RFMS-G. The results from these surveys will be shown separately. A special attention will be given to the key questions concerning language abilities.

How to measure language abilities is not a clear case. In many of the studies mentioned earlier are used self-reported language abilities. This self-reported measure might not be

equivalent to the true language proficiency as the respondents might not know, how good or bad he/she actually speaks. Some respondents might also boast or be very modest about their abilities.

In our study are used a number of different questions to measure the respondents' abilities to speak the host country language. First of all there is a number of questions where the respondents are asked about their own opinion regarding their abilities to speak Danish/German. The first question is "How would you evaluate your Danish/German language skills?" (1=Very poor, 5=Fluent). Respondents who said "Fluent" was not asked a number of other language questions. The reason is that these questions concerning language abilities might irritate respondens, who have already stated that they speak the language fluently. If the respondent do not answer "fluently" they are asked further questions concerning their abilities to communicate in the host country language in everyday life situations like; explaining themselves on the phone to the authorities, reading books and responding to job offers in writing.

These three examples are in the following used as proxies for the respondents abilities to speak, read and write Danish/German. The frequencies are shown in Table 1, where the samples are restricted to immigrants between 25 and 55 years old.

As can be seen from Table 1 only 7.7 percent of the immigrants in Denmark report that they speak or read Danish very poorly, while 13.4 percent report that they write very poorly. Furthermore there are only 20.5 percent that concider themselves good at writing, while 26-27 percent are good at speaking and reading.

Interestingly, more respondents seem to evaluate there language skills at the medium level, when we ask them the more general question: How would you evaluate your Danish language skills? compared to the speaking, reading and writing measures that all refer to abilities in more specific situations. This is also what one would expect from taking an average. However, as those who state that they are fluent in the host country language are given the same value in the speaking, reading and writing measures, this is also a consequence of the coding. Nonetheless, a comparison of the last language questions with the speaking, reading and writing abilities seems to suggest that this overall language measure is most closely related to the speaking-abilities. So when the respondents answer this question they might mostly think of (or value) their speaking-abilities.

The self-reported levels of language abilities from the immigrants in RFMS-G 2002 is in general a bit higher than in the RFMS-D 1999 and there is a greater similarity in the distribution of answers between the overall language measure and speaking abilities than writing. But in contrast to RFMS-D, there are fewer immigrants that read than speak German.

Another way of measuring the respondents abilities in the host country language is to ask the interviewer to evaluate the respondents abilities. This has been done in this study, where the interviewer at the end of each interview is asked to evaluate the respondents

Table 1: Measuring abilities: Respondents' and interviewers' assessment

	Respondents' assessment				Interviewers' assessment
	Language proficiency	Speaking	Reading	Writing	Language proficiency
RFMS-D, 1999					
Very Poor	4.6	7.7	7.7	13.4	8.6
Poor	14.9	17.7	16.8	21.1	19.6
Medium	36.6	28.1	27.3	25.7	32.4
Good	29.6	27.3	26.1	20.5	23.3
Fluent	14.3	19.2	22.2	19.3	16.2
All	100.0	100.0	100.1	100.0	100.1
No. of observations	2,331	2,297	2,227	2,185	2,331
RFMS-G, 2002					
Very Poor	3.7	8.7	16.6	15.7	6.6
Poor	13.7	14.7	16.7	17.5	13.2
Medium	32.5	23.2	19.7	21.4	23.8
Good	29.7	27.5	21.1	20.6	28.8
Fluent	20.3	25.9	25.9	24.8	27.5
All	99.9	100.0	100.0	100.0	99.9
No. of observations	4,149	4,131	4,078	4,064	4,154

language abilities at a five point scale. It is off course a major disadvantage of the language measure if the interviewer do not know the respondents language abilities well enough to evaluate them. Therefore the surveys were organized and the interviewers instructed so each interview started in Danish/German. As the interviewer mainly have information about the respondents abilities to speak the language, the language measure must be expected to mainly give a description of these abilities.

One clear advantage of the interviewers assessment (instead of the self-reported) is that he or she has other interviews to compare with and the interviewer has no incentives to exaggerate the respondents language abilities. I would therefore expect the interviewers assessment in our surveys to be somewhat nearer to the true language measure, than the self-reported language measures. I will later return to this aspect and test whether it makes any difference for our results if the language measure is changed.

A third sort of language measure is, whether the interview has been conducted in the host or home country language. This measure was introduced in Dustmann and Fabbri (2003) and a nice feature about it is, that it is actually tested whether the respondent is able to carry out the interview in the host country language. But unlike the other language measures it is not identically measured in RFMS-D and RFMS-G. The reason is that the respondents in the Danish survey had easier access to a person that could speak the host country language than was the case in Germany. The Danish survey is conducted mainly by telephone and the respondents are contacted by an interviewer from the same

country of origin. One of the first questions is what language the respondent wants to be interviewed in. Therefore it is very easy for the respondent to choose to be interviewed in the home language instead of Danish and it was only one third of the respondents that was actually interviewed in Danish. In contrast two thirds of the respondents in Germany was interviewed in German.

As noted earlier the RFMS-G was carried out as face-to-face interviews by the usual interviewer corps at Infratest Sozialforschung. As they did not speak the home country language of the respondents they were bringing a hard copy of the questionnaire in the five relevant languages. Afterwards they reported whether they had been using this hard copy during the interview and also if an interpreter had been called to help. Only in one third of the interviews, one of these two kinds of language help was used.

This difference between uses of interview language can perhaps partly be explained by better language proficiencies among immigrants in Germany than in Denmark. But the main part of the difference must be due to the different circumstances of the interviews mentioned above.

To look closer into this problem, Table 2 shows the relation between interview language and the interviewers assessment of the respondents language proficiency. The table shows that in both surveys more than 95 percent of the respondents who according to the interviewer speak the host country language very poorly are interviewed in the home country language. Among respondents speaking Danish/German poorly there is also an overwhelming majority that is interviewed in the host country language. Among immigrants in RFMS-G with medium language skills 45 percent are interviewed in German, while the figure is less than 20 percent in RFMS-D. The majority of immigrants having good language skills in RFMS-G are interviewed in German. This figure is 40 percent in RFMS-D. But being fluent in Danish makes 71 percent do the interview in Danish, in Germany it is close to 100 percent.

On basis of the different kinds of information about language proficiency I construct six language measures that are used in the further analysis. Four of them are based on respondents own assessment and regard speaking, reading and writing and the more general assessment of their language abilities. One is based on the interviewers assessment of the respondents language abilities, and the last one is whether the interview was conducted in German/Danish or the home language.

In accordance with Dustmann and Fabbri (2003), I simplify the language measure and construct dummies, where people with fluent or good language proficiency have the value one and all others have zero.

Language measures and other variables used in the analysis are shown in Table 3. The language indicators reflect the results from Table 1. More immigrants speak and read than writes the language. In Denmark the respondents evaluate their language abilities as higher than the interviewer do, in German it is opposite. This difference might reflect

Table 2: Interview language and interviewers' assessment of language

	Interviewers' assessment: Language proficiency					
	Very poor	Poor	Medium	Good	Fluent/ Very good	No. of. obs.
RFMS-D, 1999						
Interviewed in:						
- home country language	95.5	92.1	81.8	59.7	29.3	1,664
- Danish	4.5	7.9	18.2	40.3	70.7	667
All	100.0	100.0	100.0	100.0	100.0	2,331
RFMS-G, 2002						
Interviewed in:						
- home country language	98.5	93.6	55.0	11.7	2.5	1,497
- German	1.5	6.4	45.0	88.3	97.5	2,657
All	100.0	100.0	100.0	100.0	100.0	4,154

that the interviews in RFMS-D is conducted by well Danish speaking immigrants that knows the difficulties of learning the language. Wheras the interviews in RFMS-G is conducted by natives, that perhaps sometimes tend to be less critical in their judgment.

As before the sample is restricted to immigrants between 25 and 55 years old. In the Danish survey 52 percent of the respondents in this age-group are males, against 49 percent in the German survey.

In the analysis is also included dummy stating whether the immigrant is married or not. In both surveys 76% are married. I shall later return to the possible importance of the origin of the spouse. For now it should be noted that in the Danish case it is possible to divided between being married to a foreigner or a Dane in accordance with the information from Statistics Denmark. In Germany the only available information is which country the spouse is born in. In most cases immigrants spouses that are foreign will also be born abroad. But it is not always the case. In RFMS-D 66 percent of the immigrants are married to a foreigner, 11 percent are married to Danes and the rest are singles. In RFMS-G 61 percent are married to a person born outside Germany, 16 percent are married to a person born in Germany and the rest are singles. Considering the differences in measures these figures seem rather close.

Children are measured as the number of children between 0-17 years in the family. In the RFMS-G the respondents on average has 3 children, while the number is only 1.6 in RFMS-D. On average the immigrants are 37 years old in RFMS-D and one year older (38) in RFMS-G. Even though the immigrants are not much older in the German survey they have on average been longer timer (16 years) in the host country compared with immigrants in the Danish survey, who in 1999 have been 13 years in the country.

The respondents have also been asked about their health conditions. Those who state that they have chronic health problems that restricts their daily life are considered having

a bad health, all others a good health. In RFMS-G 94 percent of the respondents have a good health compared to 91 percent in the RFMS-D.

Education is often considered closely related to language abilities. To measure the immigrants education as precisely as possible I separate education obtained in host and home country and I divide between three different levels of schooling and education: Primary and secondary school, Vocational training and University education. All in all I have seven categories, the omitted being no schooling. The categories are mutually exclusive. If immigrants have completed education both in the home and the host country, I use the education from the host country. The reason for this is, that even though the home country education may have given the respondents good qualifications they seem to have needed some more since they have decided to have further education in the host country.

In RFMS-G the information on education and training is based on the respondents answers in the survey. This is also the case in RFMS-D when measuring the respondents education from the home country. Regarding their education from Denmark the most precise information is obtained from registers and I therefore use this information. As can be seen from Table 3, half of the respondents in RFMS-D has primary/secondary school from the home country as their highest educational level. In RFMS-G it is only the case for 32 percent of the respondents. Instead more have vocational training from the home country. The share that has a university education from their home country is 9 percent in Denmark and 11 percent in Germany. This is just about the same as the share that has primary/secondary school and the share that has vocational training in the respective host countries, while only 2 - 4 percent have a university education from the host country.

Looking at country of origin I find some major differences due to the sample designs described earlier. The RFMS-G only includes immigrants from the Former Yugoslavia, Iran, Lebanon, Poland and Turkey, whereas RFMS-D also includes immigrants from Pakistan, Somalia and Vietnam.

The ethnic concentration of immigrants in the neighborhood is measured by identical questions in the surveys. A dummy is constructed so immigrants who state that half or more of the people in the neighborhood are immigrants have the value one; all others have the value of zero. In the Danish case I have been able to check this information by using a register based neighborhood dataset developed by Damm et al. (2006). These comparisons show that the reliability of the survey based answers in general is good.

5 Estimation results

On the basis of the data described in the previous section I shall now turn to the discussion of what determines language proficiency and to what extent being able to speak the host country language has an influence on the employment probability.

Table 3: Selected summary statistics. Immigrants 25-55 years in Denmark and Germany

	RFMS-D 1999		RFMS-G 2002	
	Mean	StdE.	Mean	StdE.
Employment	0.4976	0.0109	0.5660	0.0077
Speaking	0.4823	0.0109	0.5308	0.0077
Reading	0.4851	0.0109	0.4612	0.0077
Writing	0.4005	0.0107	0.4444	0.0077
Language (own assessment)	0.4668	0.0109	0.4998	0.0078
Language (interviewers' ass.)	0.4175	0.0107	0.5636	0.0077
Male	0.5168	0.0105	0.4852	0.0078
Married	0.7646	0.0089	0.7612	0.0067
No. of children	1.61	0.0275	3.03	0.0548
Age	37.31	0.2089	38.20	0.1303
Year since migration	12.52	0.1378	15.80	0.1520
Prim./Sec. from home country	0.5097	0.0105	0.3199	0.0073
Vocational from home country	0.1340	0.0072	0.2449	0.0068
University from home country	0.0876	0.0059	0.1050	0.0048
Prim./Sec. from host country	0.0814	0.0058	0.1057	0.0048
Vocational from host country	0.0885	0.0060	0.1052	0.0048
University from host country	0.0353	0.0036	0.0234	0.0024
Good Health	0.9102	0.0060	0.9374	0.0038
Iran	0.0951	0.0061	0.1848	0.0061
Lebanon	0.1282	0.0070	0.1821	0.0061
Pakistan	0.1027	0.0064	-	-
Poland	0.1345	0.0072	0.2304	0.0066
Somalia	0.1336	0.0072	-	-
Turkey	0.1447	0.0074	0.2339	0.0066
Vietnam	0.1243	0.0069	-	-
Ethnic concentration (0/1)	0.2761	0.0094	0.4288	0.0078
Interviewed in Danish/German	0.2839	0.0095	0.6419	0.0075
No. of Obsevations	2,260		4,154	

Note: Educational classification: Baseline: No education, Secondary=Primary/Secondary school, Vocational training, some medium-cycle higher education and short-cycle higher education, University=Some medium-cycle higher education and University degree.

5.1 Language proficiency

To explain what determines language proficiency I follow the work of Chiswick and Miller (1995), who argues, that learning a foreign language can be seen as an investment depending on: potential future economic benefit, the exposure to the language and the efficiency in second language acquisition.

These three types of information are not always observed, as discussed earlier. But the data for this study do offer the same kind of explanatory variables as used by Dustmann and Fabbri (2003), and in addition the RFMS-D and RFMS-G contain information about both self-assessed and interviewer assessed language skills for all respondents.

In the following the language skills are explained by gender, marital status, number of children, age, years since migration, education, country of origin and ethnic concentration in the neighborhood.

These explanatory variables are used to determine the five different language measures described earlier. As mentioned the four self-assessed language measures are not constructed independent of each other, but we shall use them anyhow to give a better understanding of the overall language measure, which will be used later in the employment analysis.

In accordance with Dustmann and Fabbri (2003) language proficiency is measured as a binary variable that has the value 1 if the language proficiency is Very good/fluent or Good and otherwise zero. The estimation results in Table 4-5 are based on linear probability models, which have the advantage of having easily interpreted estimates[2]. Table 4 shows the results from the dataset RFMS-D 1999. As can be seen from the table men are more likely to have good or fluent language skills than women. This is in accordance with previous studies and might be related to the fact that the man is often the breadwinner in the family, and learning the language might therefore in general be associated with higher future economic benefits for males.

Being married seems to have a negative effect, but this effect is only significant, when it comes to speaking and reading the language. This might reflect that married immigrants are less likely to have many contacts among natives, unless married to one.

As argued ealier having children could have both positive and negative effect on the language skills. In this case it seems to have a negative effect, perpaps due to the translation help from older children or due to the time-constrain that smaller children impose on their parents (especially the mother).

The age variable in general has a negative sign, but is not significant in this analysis with respondents between 25 and 55 years old. The interpretation of the age variable is here age given the number of years since migration. Therefore a negative effect of age indirectly shows that immigrants who arrive at an early age are more likely to become

[2]Estimations based on a probit-model has also been calculated. Marginal effects based on mean characteristics show very similar results.

Table 4: Language Determinants, Linear Probability Models. Denmark, 1999

	Respondents' assesment		Speaking		Reading		Writing		Interviewers' assesment	
	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.
Male	0.1029*	0.0194	0.1048*	0.0190	0.0769*	0.0194	0.0797*	0.0200	0.0612*	0.0180
Married	-0.0389	0.0237	-0.0233	-0.0232	-0.0101	0.0236	-0.0014	0.0242	-0.0094	0.0221
No. of children	-0.0181*	0.0074	-0.0256*	0.0073	-0.0256*	0.0075	-0.0197*	0.0077	-0.0271*	0.0069
Age	-0.0227	0.0123	-0.0043	0.0121	0.0097	0.0123	0.0048	0.0126	-0.0056	0.0115
$Age^2/100$	0.0107	0.0157	-0.0120	0.0154	-0.0276	0.0157	-0.0186	0.0162	-0.0123	0.0145
Years since migration	0.0423	0.0052	0.0457*	0.0051	0.0319*	0.0052	0.0285*	0.0053	0.0479*	0.0049
Years since $migration^2/100$	-0.0642	0.0150	-0.0770*	0.0147	-0.0425*	0.0149	-0.0435*	0.0152	-0.0729*	0.0140
Education:										
Prim./Sec. from home country	0.0134	0.0376	0.03172	0.0374	0.0506	0.0394	0.0098	0.0403	0.0167	0.03511
Vocational from home country	0.0514	0.0458	0.0721	0.0454	0.0774	0.0475	0.0780	0.0487	0.0570	0.0428
University from home country	0.1823*	0.0483	0.2530*	0.0479	0.2783*	0.0495	0.2350*	0.0507	0.2247*	0.0451
Prim./Sec. from host country	0.1270*	0.0513	0.2023*	0.0507	0.2613*	0.0523	0.2250*	0.0534	0.1758*	0.0478
Vocational from host country	0.2404*	0.0496	0.2924*	0.0490	0.3267*	0.0506	0.3210*	0.0517	0.3195*	0.0463
University from host country	0.2745*	0.0659	0.3415*	0.0648	0.3763*	0.0661	0.4704*	0.0672	0.3841*	0.0615
Good health	0.0846*	0.0332	0.0917*	0.0329	0.0779*	0.03422	0.0312	0.0354	0.0800*	0.0309
Iran	0.0693	0.0432	0.0003	0.0423	-0.1291*	0.0429	-0.0687	0.0441	-0.0136	0.0402
Lebanon	-0.0578	0.0414	-0.1435*	0.04067	-0.3044*	0.0419	-0.1339*	0.0429	-0.1530*	0.0385
Pakistan	-0.2521*	0.0441	-0.2979*	0.0432	-0.4537*	0.0442	-0.265*	0.0456	-0.3434*	0.0409
Poland	0.0677	0.0393	0.0144	0.0387	-0.0015	0.0394	-0.0146	0.0409	0.0057	0.0365
Somalia	-0.0911*	0.0391	-0.1565*	0.0385	-0.1649*	0.0392	-0.1100*	0.0407	-0.1321*	0.0363
Turkey	-0.2023*	0.0421	-0.3961*	0.0412	-0.5116*	0.0421	-0.4060*	0.0435	-0.4473*	0.0391
Vietnam	-0.3989*	0.0415	-0.4646*	0.0408	-0.5321*	0.0413	-0.3676*	0.0426	-0.3751*	0.0386
Ethnic concentration (0/1)	-0.0241	0.0212	-0.0527*	0.0209	-0.0499*	0.0214	-0.0699*	0.0220	-0.0649*	0.0198
Constant	0.7073*	0.2360	0.4077	0.2320	0.3021*	0.2362	0.2748	0.2427	0.3906	0.2195
No. of observations	2,255		2,221		2,152		2,111		2,255	
R^2	0.2542		0.2977		0.2968		0.2415		0.3324	

fluent in the host country language. But this effect is not significant in RFMS-D 1999.

One potentially very important determinant of language skills is the educational level. In this analysis we divide between education from home and host country, as some part of the human capital obtained through education in the home country may not be easily transferred to the host country. This is confirmed when looking at the estimates. There does not seem to be any significant effect of having attained primary/secondary school compared to having no schooling. A vocational education from the home country does not help either. However, having a university degree from the home country significantly raises the probability of being proficient in Danish, and this goes for all five measures of language skills. Having obtained education in the host country on the other hand raises the probability in all language measures. As expected the probability raises most when the respondent has a university degree. The correlation between language and education is strong for all five measures, but as one would expect the correlation is strongest when it comes to writing the language. Looking at Table 4 this also seems to be the case.

Health conditions can play an important role for language acquisition, as people with a bad health must be expected to have more difficulties to cope with daily life and less energy to learn a new language. This is confirmed by Table 4, where having a good health seems to improve language skills. The effect is significant for all language measures except for writing.

As noted by Chiswick and Miller (1995) it must be easier to learn a language if the linguistic distance is small. Chiswick and Miller (2005) estimate such a distance between English and a range of languages by estimating the difficulty Americans have to learn the other language. To my knowledge such a measure has not yet been made between Danish or German and a range of other countries.

Another approach is to look at the origin of the languages, as they are presented in the language trees. One would then expect that languages that are more closely related, like German and Danish compared to Hebrew or Arabic, are also easier to learn. As the language trees cannot tell us exactly how far one language is from the other one needs to include the different languages as seperate dummies in the analysis.

In most cases the mother tongue will be very closely related to the country of origin. Therefore the linguistic distance is expected to be captured by this variable. However, country of origin also includes other aspects like cultural distance. But this would also be the case if language dummies were used as these also would be highly correlated with cultural aspects.

Returning to Table 4 we notice that immigrants from Poland and the former Yugoslavia (the baseline) are most likely to have the best Danish language skills. One reason for this might be that the languages spoken in these countries are Slavic and within the indo-European language tree and presumably more closely related to Danish than for instance Arabic. But the cultural distance may also be smaller, and this may help immigrants

from these countries to get in contact with Danes etc., so we can only state that people from Poland and the former Yugoslavia have better language skills, but we cannot state exactly why.

As noted earlier, ethnic concentrations are measured by a dummy variable indicating whether or not more than half of the people in the neighborhood are immigrants. As immigrants who live close to other immigrants might not be exposed to the native language, we expect the effect to be negative. Looking at the estimates in table 4 there seems to be a negative correlation between ethnic concentration and language proficiency, but one should be careful about interpreting this as a causal relationship.

Looking at the five different language measures in table 4, there are many similarities. But educational level seems to be most important when it comes to writing. The explanatory power of the model seems to be highest when the language that is determined is the interviewers overall assessment of the language skills.

Turning to immigrants in Germany, table 5 shows the estimation results based on RFMS-G from 2002.

The immigrant men in the German sample have a higher probability of being fluent or good in the host country language compared to women. Just like married seems to have a lower probability of being fluent or good in the host country language than singels A result that is very much in line with the Danish results.

For a given number of years since migration the age variable has a negative impact on the language skills, reflecting that immigrants who have arrived in Germany at a young age are more likely to be proficient in German. The number of years in Germany has a positive, but marginally declining effect on the language skills. The effect is significant for all language measures.

The educational level also has a very significant and positive effect, and the correlation seems to be even greater than in Denmark. There could be several reasons for this. One might be that as German (in contrast to Danish) is a world language and it could have been learned in the home country. This would strengthen the correlation between language skills and education from home country. Another reason could be differences in the educational system in the two host countries. One of the major differences between the educational systems in Germany and Denmark is that in Germany the students move to different schools depending on their grades and performance as early as 4th grade, while the differentiation happens more gradually in Denmark and is not completed until after 9th grade. A result of this early sorting in Germany could be a larger heterogenity between the different educational groups in Germany, which would then affect the estimates regarding education from the host country. For a more in-dept description of the educational systems in Germany and Denmark, see Constant and Larsen (2004).

Having a good health also raises the language skills in Germany. The effect is significant for all language measures except for reading.

Table 5: Language Determinants, Linear Probability Models. Germany, 2002

	Respondents' assesment		Speaking		Reading		Writing		Interviewers' assesment	
	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.
Male	0.0807*	0.0136	0.0731*	0.0137	0.0179	0.0134	0.0553*	0.0134	0.0797*	0.0136
Married	-0.0494*	0.0169	-0.0360*	0.0170	-0.0383	0.0167	-0.0104	0.0167	-0.0299	0.0169
No. of children	-0.0090*	0.0022	-0.0068*	0.0023	-0.0046*	0.0022	-0.0078*	0.0023	-0.0061*	0.0023
Age	-0.0108	0.0079	-0.0207*	0.0081	-0.0175*	0.0079	-0.0179*	0.0079	-0.0107	0.0080
Age^2/100	0.0002	0.0102	0.0134	0.0102	0.0081	0.0100	-0.0097	0.0100	-0.0020	0.0102
Years since migration	0.0435*	0.0025	0.0453*	0.0025	0.0396*	0.0024	0.0355*	0.0024	0.0468*	0.0025
Years since migration^2/100	-0.0634*	0.0059	-0.0712*	0.0059	-0.0564*	0.0058	-0.0487*	0.0058	-0.0737*	0.0059
Education:										
Prim./Sec. from home country	0.0868*	0.0245	0.1061*	0.0247	0.0920*	0.0242	0.0529*	0.0242	0.0879*	0.0245
Vocational from home country	0.1715*	0.0266	0.1725*	0.0268*	0.1525*	0.0262	0.1013*	0.0262	0.1879*	0.0267
University from home country	0.3280*	0.0311	0.3921*	0.0313	0.4265*	0.0306	0.3492*	0.0307	0.3898*	0.0311
Prim./Sec. from host country	0.3312*	0.0312	0.3340*	0.0314	0.3748*	0.0307	0.3610*	0.0308	0.2776*	0.0312
Vocational from host country	0.3667*	0.0310	0.3977*	0.0313	0.4245*	0.0306	0.4116*	0.0307	0.3546*	0.0311
University from host country	0.4313*	0.0498	0.4578*	0.0502	0.5505*	0.0491	0.5223*	0.0492	0.4075*	0.0499
Good health	0.1227*	0.0279	0.0802*	0.0279	0.0370	0.0272	0.0850	0.0274	0.1026*	0.0277
Iran	0.0355	0.0232	0.0455	0.0233	0.0491*	0.0228	-0.0656	0.0229	0.0484*	0.0232
Lebanon	-0.0921*	0.0234	-0.0782*	0.0236	-0.1189*	0.0230	-0.0635*	0.0231	-0.1272*	0.0234
Poland	0.1207*	0.0217	0.1221	0.0219	0.1175*	0.0214	0.1445	0.0214	0.1083*	0.0365
Turkey	-0.1382*	0.0217	-0.1573*	0.0218	-0.1609*	0.0214	-0.1327*	0.0214	-0.1610*	0.0217
Ethnic concentration (0/1)	-0.0528*	0.0134	-0.0406*	0.0134	-0.0187	0.0214	-0.0363*	0.0132	-0.0507*	0.0134
Constant	0.2032	0.1533	0.4117*	0.1545	0.3985*	0.1510	0.3562	0.1515	0.2836	0.1534
No. of observations	4,058		4,058		4,058		4,058		4,058	
R^2	0.3064		0.2934		0.3239		0.3154		0.2935	

As Denmark is rather closely linked to Germany both in respect to culture and language, one would expect that those having most trouble learning Danish might also have most trouble learning German. Looking at the estimates from the RFMS-G it seems that among the five countries in the survey there is a ranking somewhat similar to the RFMS-D. Immigrants from Turkey have the lowest probability of being proficient in German, followed by the Lebanese and immigrants from the former Yugoslavia. Interestingly, Iranians do better than the Yugoslavs, while immigrants from Poland have the highest probability of being proficient in German.

When immigrants from Poland are clearly doing better in Germany (but not in Denmark) than immigrants from the former Yugoslavia it might be related to the fact that Poland and Germany are neigh boring countries with close relations making it worthwhile for people in Poland to learn German. However it should be pointed out that the RFMS-G do not include ethnic Germans from Poland (Aussiedlers), so this is not part of the explanation.

When it comes to ethnic concentration in the neighborhood there seems just like in Denmark - to be a negative correlation between language proficiency and ethnic concentration.

All in all there are many similarities in what seems to determine language proficiency in the two countries. These results are also in line with what is found in Dustmann and Fabbri (2003), who use almost the same explanatory variables to explain language proficiencies in the UK among immigrants from a range of non-Western countries.

The four dimensions of self-assessed language abilities can to a large extent be explained by the same determinants. Although the ability to write (and in Germany also read) the host country language seems more closely related to the educational level than the ability to speak the language. In the analysis that follows we shall restrict the analysis to only two of the language measures, namely the respondents overall assessment of their language skills and the interviewers assessment of the language skills. Both of these measures seem more suitable for evaluation the respondents speaking abilities than for evaluation reading and writing abilities.

5.2 Employment probability

After having discussed what determines immigrants' language proficiency in the host country, we shall now investigate to what extent being fluent in or good at the host country language helps immigrants find a job.

A first problem here to consider is whom to include in the employment analysis. A problem that sounds trivial, but turns out to be rather crucial. Up until now everybody between 25 and 55 years has been included in this paper. Turning to the employment analysis it might seem natural to focus on immigrants, who are on the labor market. This is done in Dustmann and Fabbri (2003), who base their employment analysis on

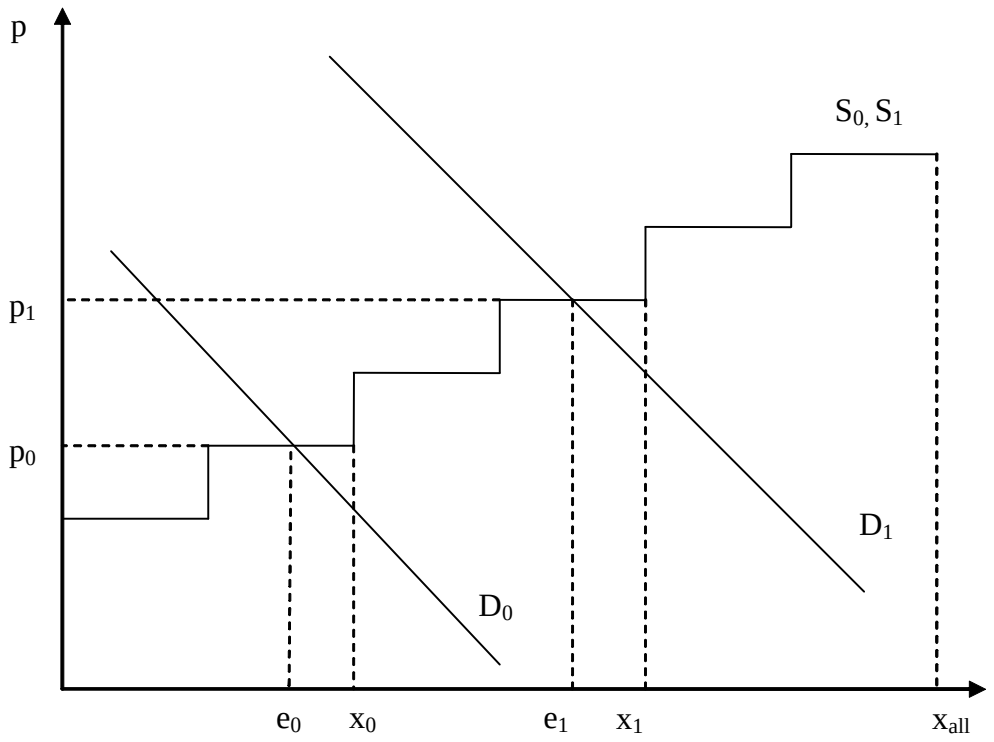


Figure 1: Employment Effect and Selection of Sample

those immigrants, who are employed or unemployed according to the ILO definition. According to the ILO definition people are employed if they have at least one hour of weekly work and, consequently, unemployed are those, who are unemployed the whole week. Furthermore the unemployed need to have been actively searching for at job within the past four weeks and be able to start in a new job within two weeks.

One good argument for this restriction of the sample is, that it is very certain that the analysis only includes people who are really interested in a job. But we might on the other hand exclude people, who consider themselves unemployed, but for some reason did not fulfill the abovementioned criterias' or people who would actually like to have a job, but have given up because they do not have sufficient language skills. These immigrants might enter the labour force when they eventually have required the necessary skills.

To discuse this problem on a more formal basis consider Figure 1.

This simple figure illustrates the difference between including all immigrants in the analysis and only considering those, who participate on the labor market. The demand for immigrant labor is assumed to be higher if the immigrant speaks the host country language (D_1), than if he/she does not (D_0). Therefore the demand curve D_1 lies above D_0. Immigrants' labor supply is presented by a "stair-formed" curve. Here illustrated as having the same shape independent of the language skills. All those immigrants with the lowest reservation wages receive a job first, but if the supply of labor for a given price

level exceeds the demand, unemployment occurs. Therefore e_0 is the number of employed and x_0 the number in the labor force among immigrants without language skills, while e_1 and x_1 are the similar numbers among those with language skills. Each language-group consists of x_{all} persons. The number of unemployed with and without host country language skills are given by $x_0 - e_0$ and $x_1 - e_1$.

If all immigrants are included in the analysis $E(y^0) = \frac{e_0}{x_{all}}$ and $E(y^1) = \frac{e_1}{x_{all}}$, therefore $E(y^1 - y^0)_{all} = \frac{e_1 - e_0}{x_{all}}$

If only immigrants, who fulfill the ILO criteria are included $E(y^0) = \frac{e_0}{x_0}$ and $E(y^1) = \frac{e_1}{x_1}$ and hence $E(y^1 - y^0)_{ILO} = \frac{e_1}{x_1} - \frac{e_0}{x_0}$

Considering only immigrants in the labor force we will therefore overlook that employment could be raised from x_0 to e_1 if the immigrants change status from demand curve D_0 to D_1. In other words, improving language skills might not only influence whether the immigrants become employed or not, but also if they join the labor force. So if the sample consists only of immigrants in the labor force we might exclude an important part of the employment effect and thereby underestimate the effect.

But including all immigrants is not without problems either. Some of the immigrants might have no intension of ever entering the labor market and this effect might very well be more common among immigrants without host language skills. In relation to Figure 1 it means that the supply curves no longer have the same shape among immigrants with and without host language skills. From a practical perspective it also means that the group without employment becomes more heterogeneous when it consists of both unemployed and people not part of the labor market. This does not have to be a problem, if we have all the otherwise unobserved information that is needed to explain the differences in employment. But if this is not the case, the analysis will tend to overestimate the effect of language if language skills are correlated with the unobserved characteristics.

In the following I will therefore estimate the employment effect of language based on all immigrants between 25 and 55 years and those that fulfill the ILO criterias and I will consider the results as an lower and a upper bound of the employment effect of language.

A second problem to consider is what language measure to use. The main concern is to find a language measure of importance for labor market behavior which at the same time contains as little measurement error as possible. All the language measures in the RFMS could in principle be of interest here. But particularly the two measures that contain an overall assessment of the immigrants' language proficiency must be of interest.

As noted earlier I would expect the interviewers' assessment of the respondents' language proficiency to be nearer to the true language measure than the respondents' own assessment. This is because the interviewer has other interviews to compare with and has no incentives to exaggerate the respondents' language abilities.

However, to see if it makes any difference whether I use the interviewers' or the respondents' assessment two different estimations of the employment probability have been

Table 6: Employment probability and language proficiency, two language measures

	RFMS-G 2002		RFMS-D 1999	
	Coeff.	StdE.	Coeff.	StdE.
OLS, respondents' language assessment	0.1223*	0.0165	0.1072*	0.0212
OLS, interviewers' language assessment	0.1634*	0.0164	0.1994*	0.0225
No. of observations	4,127		2,266	

made. The two models are alike except for the change of language variable. The complete employment model is presented in the following section, but for know I shall concentrate on the estimated employment effects. These estimates are shown in Table 6 that presents the results for all immigrants in RFMS-G and RFMS-D.

The table shows that the employment effect of speaking the host country language good or fluently is higher if the interviewers' assessment of the language proficiency is used instead of the respondents' own assessment. This is in line with the hypothesis that the measurement error is smaller, when the interviewer evaluates the language proficiency. This might also explain why the employment effect raises more in RFMS-D, where the interviewers seemed to be more critical.

One potential problem could be if some of the interviewers based their judgment of the respondents' language proficiency on respondents' performance on the labor market. But RFMS-D 1999 contains detailed information about who conducted the interview and there seems to be no problems of that kind. I will therefore consider the interviewers' assessment as the most accurate one, and it will be used in the following sections.

5.2.1 Employment effect of language proficiency in Germany

As noted earlier the RFMS-G consists of 4,154 immigrants between 25 and 55 years. Among these respondents 2,351 are employed and 345 state that they are unemployed and fulfill the ILO criterias.

As mentioned at the beginning of this paper one common way of measuring employment effects has been to assume that the relation between employment and language proficiency can be explained by a linear probability function, and estimate it by OLS. This straightforward approach might lead to serious bias in the estimates, but we will return to this after having actually looked at the results from using this approach.

In table 7 are shown estimations of employment probabilities with the following explanatory variables: language proficiency, gender, being married, no. of children, age, years since migration, education, health condition and country of origin. These are the same explanatory variables as in Dustmann and Fabbri (2003), except from the health information, which as explained ealier, potentially is very important for both language skills and employment situation, but sometimes is difficult to obtain information about. The other explanatory variables are all the kind of information that is usually included in

language studies except from the distinction between education from home and host country. An information that could be very important as education from the home country might not be fully transferable to the host country.

The number of observations with the necessary information is reduced from 4,127 to 2,682 when the sample is restricted to respondents in the labor force. Turning to the results, the language variable is, as expected, shown to have a higher influence on the employment probability, when the sample consists of all immigrants instead of those in the labor force. The language measure used here is the interviewers' assessment of the respondents' language skills. The coefficient is 0.1634 in the sample that includes all immigrants between 25 and 55 and is highly significant. It states that the employment rate among all immigrants is 16 percentage points higher for those speaking the host country language, everything else being equal. The coefficient of the language variable is much lower (0.0411) when looking at the sample that only includes immigrants in the labor force.

The selection of individuals into the labor force is also illustrated by the coefficient of the gender variable. Looking at immigrants in the labor force, being male seems to have a negative impact (-0.0587) on the employment. The interpretation of this result is probably not that immigrant women in Germany are the most highly demanded labor, but rather that being a woman not only influence employment, but also whether you join the labor force. This is confirmed by the analysis, where all immigrants are included. In this case being a male raises the employment probability by 0.1960.

Being married raises the employment chance significantly in both samples, while the number of children decreases the probability of being employed. The negative employment effect of having children found in this and the following estimations is primarily due to an effect on women's labor market behavior. I have therefore also estimated alternative probability models, where the effect of having children was allowed to be different for men and women. However, this does not have any effect on the estimates of the language proficiency variable, that is the main object of this article, and these alternative estimations are therefore not shown.

Including all respondents between 25 and 55 years old, the combined age variable has a small, but significant, negative effect on the probability of being employed, while the number of years in the country variable raises the probability of being employed up to 28 years of stay, but at a declining rate. Among immigrants in the workforce none of these variables are significant, probably reflecting that age and years in the host country are more decisive for being on the labor market than for being employed given that you are participating on the labor market.

Having attended primary/secondary school in the home country significantly improves the employment probability when all immigrants between 25 and 55 years are included, and having vocational training or a university degree from the host country is even bet-

Table 7: Employment probabilities, Linear Probability Models. Germany, 2002

	Workforce		All	
	Coeff.	StdE.	Coeff.	StdE.
Language proficiency	0.0411*	0.0151	0.1634*	0.0164
Male	-0.0587*	0.0134	0.1960*	0.0143
Married	0.0448*	0.0160	0.0574*	0.0177
No. of children	-0.0094*	0.0024	-0.0218*	0.0024
Age	-0.0006	0.0078	0.0263*	0.0084
$Age^2/100$	0.0006	0.0099	-0.0353*	0.0106
Years since migration	0.0014	0.0026	0.0167*	0.0027
Years since $migration^2/100$	-0.0014	0.0059	-0.0312*	0.0063
Education:				
Prim./Sec. from home country	-0.0115	0.0282	0.0566*	0.0257
Vocational from home country	-0.0104	0.0294	0.0979*	0.0280
University from home country	0.0088	0.0336	0.1116*	0.0332
Prim./Sec. from host country	-0.0111	0.0327	0.0124	0.0330
Vocational from host country	0.0251	0.0313	0.1943*	0.0330
University from host country	0.0657	0.0657	0.2097*	0.0525
Good health	0.1388*	0.0340	0.2952*	0.0289
Iran	-0.0214	0.0221	-0.0230	0.0242
Lebanon	-0.1189*	0.0241	-0.1320*	0.0245
Poland	0.0317	0.0203	0.0863*	0.0228
Turkey	0.0015	0.0210	-0.0039	0.0229
Constant	0.7450*	0.0151	-0.5676*	0.1607
No. of observations	2,682		4,127	
R^2	0.0684		0.2158	

ter. However, having vocational education or a university degree from the home country improves the employment chances even more. Among immigrants in the workforce the educational variables are not significant, probably both reflecting that the effect and the sample size here are smaller.

Health condition are very important for employment, and the coefficient is twice as high (0.2952) when all immigrants are included compared to the smaller ILO sample.

Coming from Poland increases the employment probability compared to immigrants from the former Yugoslavia, while immigrants from Lebanon has a significantly lower employment probability.

The explanatory variables that have been included in the analysis so fare are all, except from health and education from home country, variables that are commonly used in employment analysis. When estimating the effect of language it might, as noted in the beginning, be very important to control for (otherwise) unobserved heterogenity. Therefore I try to include extra variables that can correct for this.

Two characteristics that could be correlated with language skills are the respondent's intelligence and eagerness to be integrated on the labor market. Our survey has no direct test of these personal characteristics, but I do have information about father's education, a variable that traditionally has been used to correct for unobserved heterogeneity in language analysis, because the parental capital can be very important for their children's human capital acquisition.

I also include a dummy variable stating whether or not the immigrant has attended a language course in order to measure his/hers eagerness to learn the language. Residential status is often considered important information because refugees, guest workers and family reunified immigrants might have different backgrounds and obviously also very different reasons for immigrating. I therefore include a dummy for being refugee and a dummy for being guest worker.

The last information included is partner's characteristics and I include two dummies stating whether an immigrant (in the German case) is married to a German or married to a foreign citizen.

If the language skills are positively correlated with the unobserved abilities one would expect the estimates for the language variable to be upwards-biased in the first place and therefore fall, when information correcting for the unobserved abilities is introduced. On the other hand, if the correlations between language skills and unobserved abilities are negative, then the estimate will tend to raise, when further information is introduced. This could be the case if those immigrants, who do not learn the language well are doing relatively better on the labor market without the language skills than the other immigrants who actually learned the language, see Willis and Rosen (1979).

To see how the inclusion of new variables affect the language coefficient consider Table 8. The first row shows the language estimates from the OLS-regression in Table 7. The

Table 8: Employment probability and language proficiency in Germany

	Workforce		All	
	Coeff.	StdE.	Coeff.	StdE.
1: OLS	0.0411*	0.0151	0.1634*	0.0164
2: OLS including extra variables	0.0344*	0.0156	0.1473*	0.0168
3: Prop. Matching	0.0364	0.0294	0.1529*	0.0302
4: Prop. Matching and Measurement Error	0.0864*	0.0395	0.2500*	0.0479
No. of observations	2,682		4,127	

second row shows the language estimates, when the extra explanatory variables has been included. These estimates are somewhat lower, but the change is rather modest.

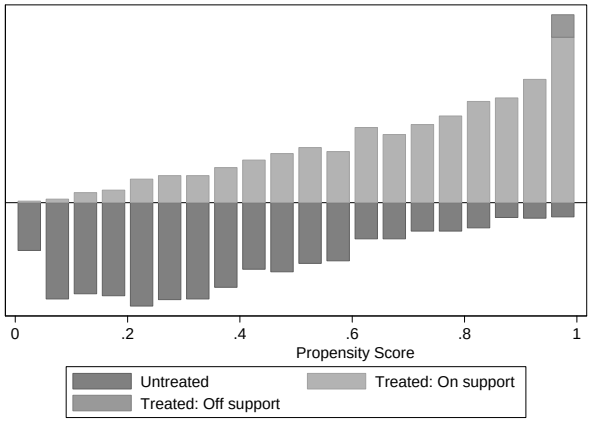
Until now I have only explored the employment effect of language skills in the set-up of a linear probability model estimated by OLS. In this model the employment probability is assumed to be described by a linear function of the explanatory variables, with the same coefficient for all respondents. If these assumptions do not hold the OLS-estimates can be rather misleading. To deal with this we loosen up the functional form assumptions and test what happens if we instead use a matching procedure to find the employment effects of language skills.

This alternative approach is described in section 3. We now allow the employment effect to differ between individuals and focus on estimating the average treatment on the treated (ATT). As this is done by matching we also shift to a non-parametric approach, where the relation between employment and the explanatory variables no longer needs to be described by a linear function. Instead we match the treated with similar immigrants among the non-treated and calculate the difference in employment levels. The treatment group includes all respondents who speak the host country language fluently or well according to the interviewer. As the number of observations is limited, I use the propensity score to establish whom to match with among the non-treated. A Gaussian Kernel based estimator is used in the estimations.

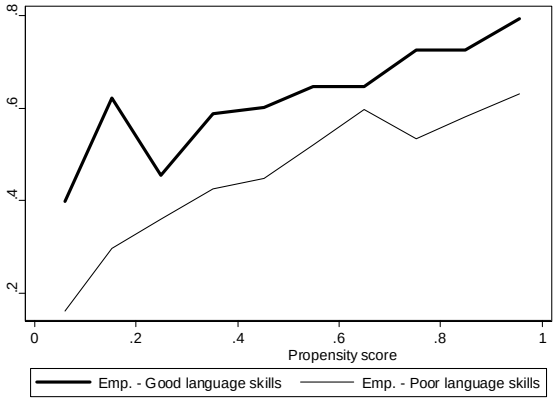
To illustrate the matching method in practice look at the figures on page **??**. The employment effect of matching is basically found as the difference in employment level between the treated and non-treated with same propensity scores, weighted on the treated. Figure 2a) shows the density of treated (those who speak the host country language) and non-treated (those who do not) in relation to the propensity score. Figure 2b) shows the actual employment levels among treated and non-treated depending on propensity scores. As the propensity score estimates the probability of speaking the language based on a set of explanatory variables it is in general expected to find higher propensity scores among those who actually speak the language, than among those who do not. But if there are none or only few among the non-treated with propensity scores at the same levels as the treated a common support problem exist and the match might become biased. To ensure that this does not happened 45 observations in RFMS-G that are off support are exclude.

Figure 2: Matching by the propensity score, Germany 2002

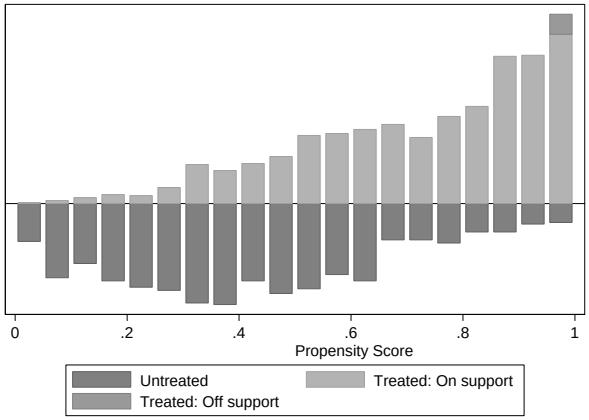
Density: **Employment level:**



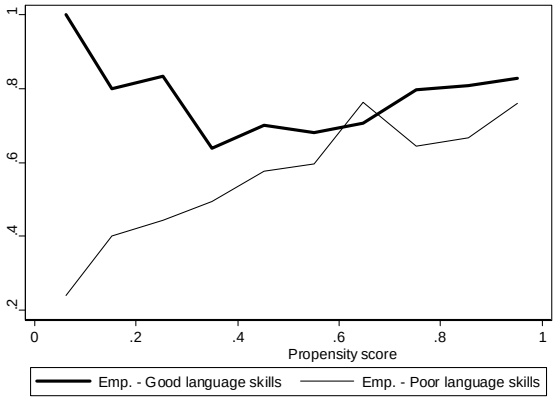
a) All immigrants



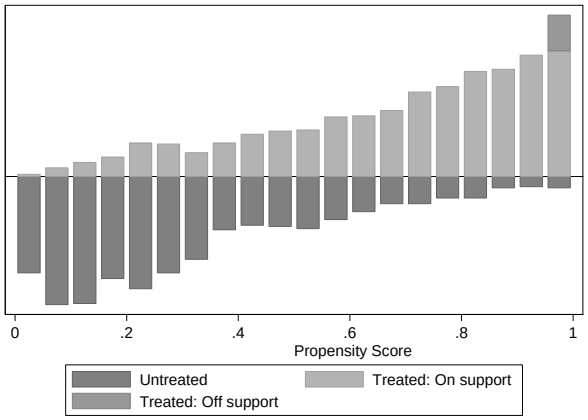
b) All immigrants



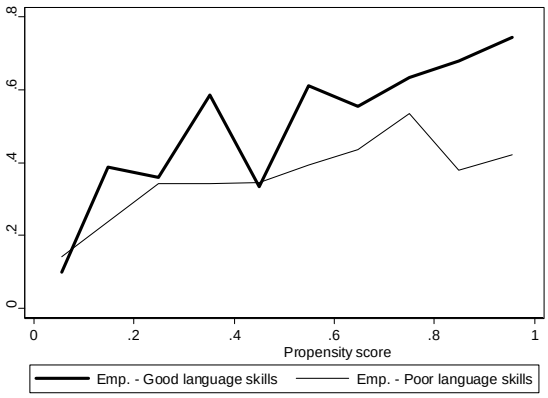
c) Men



d) Men



e) Women



f) Women

Table 9: Employment probability and language proficiency in Germany by gender, 2002

	Workforce				All			
	Men		Women		Men		Women	
	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.
1: OLS	0.0717*	0.0211	-0.0081	0.0203	0.1484*	0.0228	0.1512*	0.0234
2: OLS+	0.0642*	0.0216	-0.0130	0.0212	0.1306*	0.0232	0.1393*	0.0242
3: PM	0.0481	0.0251	-0.0047	0.0297	0.1046*	0.0292	0.1986*	0.0330
4: PM+M	0.1088	0.0557	0.0346	0.0534	0.1890*	0.0683	0.3167*	0.0615
No. of obs.	1,622		1,060		2,008		2,119	

The first result of this matching is shown in the third row in Table 8. Note that the matching here is based on the same explanatory variables as in the OLS-regression in second row. Using this approach and including both males and females the employment effects actually seem to be the same regardless of the estimation method. But the standard deviation is higher when matching is used and the estimated effect of language skills among immigrant in the labor force is no longer significant.

The fourth row show the results, when the instrument variable approach is used to control for measurement error in the language variable. The instrument used is a dummy for whether or not the interview has been conducted in the host country language. The same instrument is used by Dustmann and Fabbri (2003) and it seems like the best available instrument in the RFMS-G. Because interview language and language proficiency must be correlated and the employer seems to have no interest in what language the immigrant is interviewed in. It may however be that the optimistic spirit (or whatever) that makes the immigrant willing to conduct the interview in the host country language could be valuable for an employer as well. In that case the estimated employment effect will be upwards-biased. If this is not the case, the results suggest that the usually measured employment effect is only half the size of the effect, when taking account of the measurement error.

In order to see if the results in Table 8 are equal for both sexes the analysis has also been run separately for men and women. The result is shown in Table 9. Looking at the OLS-results in the first row it seems that the employment effect is almost the same for men and women, if all immigrants are included in the analysis. If only immigrants in the labor force are considered there is no employment effect at all of language skills among women, while the effect is 0.07 and significant for men. A difference that certainly emphasize the selection process when women join the labor force. Controlling for additional variables shrinks the estimate a bit as it can be seen from the second row.

Using a matching procedure shrinks the estimates in the third row even further for men, while the effect becomes larger if all women in the sample are considered. This discrepancy cannot be explained by the use of different explanatory variables as these are the same in both analyses. Instead it has got to do with the difference in methodology.

The OLS estimate is based on the assumption that the probability of employment can be explained by a linear relationship and that the effect of different explanatory variables – including language skills – are the same for everybody. In matching a non-parametric approach is used and the employment effect is allowed to be heterogeneous. So the average treatment effect among the treated (ATT) as I focus on here can be different than the effect among the non-treated.

To see what happens in practice consider again the figures on page **??**. Looking at the Figure 2d) and 2f) it seems that employment effect of language becomes smaller with rising propensity scores for men, whereas the upper side seems to be the case for women. So when calculating the ATT one gives weight to those immigrants who actually learned the language and in general have higher propensity scores. Therefore the employment effect tend to fall among men and rise among women compared to the OLS estimates shown in the second row.

The result of adjusting for measurement error in the language variable is shown in the fourth row. The employment effect of language skills nearly doubles for both men and women, as it was also the case earlier.

5.2.2 Employment effect of language proficiency in Denmark

In order to investigate the employment effect of language proficiency among immigrants in Denmark, I present results based on RFMS-D similar to those in the previous section based on the RFMS-G. But as noted in section 4.3 the interview language is not a good instrument for language proficiency in the Danish case. Therefore it is not possible to calculate the importance of the measurement error in the Danish case.

Again I start by estimating linear probability models based on all immigrants in the sample between 25 and 55 years old, and those immigrants that are in the workforce. The number of observations is - as shown earlier - considerably lower in the RFMS-D 1999, than in RFMS-G 2002. All in all there are 2,266 immigrants between 25 and 55 years old. They are reduced to 1,189, of whom 111 are unemployed, when only immigrants in the workforce are included.

In Table 10 I show the results of estimating the employment probabilities in RFMS-D 1999. The effect of language proficiency, is like in the German case, highly significant, but differs substantially depending on whether I include all immigrants in the survey (0.1994) or restrict the sample to immigrants in the workforce (0.0699). Being male also raises the probability of employment, but only when all immigrants are included. This suggest that being a male has a positive impact on the probability of joining the workforce, but unlike the German case the sign of the gender estimate does not change when looking only at immigrants in the workforce. One reason for this could be that while the German welfare system is largely built up on family-based transfers, the Danish tax and social security system is more based on the individual. This could encourage more women also among

Table 10: Employment probabilities, Linear Probability Models. Denmark, 1999

	Workforce		All	
	Coeff.	StdE.	Coeff.	StdE.
Language proficiency	0.0699*	0.0195	0.1994*	0.0225
Male	0.0034	0.0173	0.1649*	0.0143
Married	-0.0251	0.0214	0.0474*	0.0235
No. of children	-0.0034	0.0074	-0.0267*	0.0073
Age	0.0297*	0.0109	0.0346*	0.0122
$Age^2/100$	-0.0378*	0.0140	-0.0480*	0.0155
Years since migration	-0.0083	0.0046	0.0209*	0.0053
Years since $migration^2/100$	-0.0276*	0.0129	-0.0308*	0.0150
Education:				
Prim./Sec. from home country	0.0180	0.0282	0.0531	0.0374
Vocational from home country	0.0197	0.0294	0.0652	0.0456
University from home country	-0.0043	0.0336	0.0846	0.0483
Prim./Sec. from host country	-0.0066	0.0487	-0.0413	0.0512
Vocational from host country	0.0041	0.0464	0.1105*	0.0498
University from host country	0.0335	0.0544	0.1614*	0.0659
Good health	0.0323	0.0340	0.3517*	0.0330
Iran	-0.0449	0.0360	-0.1488*	0.0429
Lebanon	-0.0966*	0.0384	-0.2422*	0.0407
Pakistan	-0.0483	0.0203	-0.0752	0.0443
Poland	0.0085	0.0312	-0.0158	0.0387
Somalia	-0.0272	0.0406	-0.2249*	0.0389
Turkey	-0.1742*	0.0347	-0.1125*	0.0427
Vietnam	0.0306	0.0347	-0.0211	0.0420
Constant	0.3820*	0.0195	-0.7466*	0.2337
No. of observations	1,189		2,266	
R^2	0.1070		0.2738	

immigrants to join the workforce.

Being married has a positive impact of the employment probability among all immigrants, while having children has the opposite effect. The combined age-variable has a positive but declining impact on employment until the age of 37 years and thereafter a negative impact. Having an education and especially one from the host country has a positive effect on the employment probability. A good health significantly raises the probability to be employed among all immigrants, while the effect is much smaller among immigrants in the workforce. Immigrants from Iran, Lebanon, Somalia and Turkey are less likely of being employed than immigrants from the former Yugoslavia (the baseline), Vietnam and Poland.

To see to what extend the estimated employment effect of language is sensitive to changes in the specification of the model consider Table 11. Just like in the German case, the first row repeats the language estimates from the previous OLS regression, i.e. including the explanatory variables shown in Table 10.

Table 11: Employment probability and language proficiency in Denmark, 1999

	Workforce		All	
	Coeff.	StdE.	Coeff.	StdE.
1: OLS	0.0699*	0.0195	0.1994*	0.0225
2: OLS including extra variables	0.0815*	0.0211	0.1978*	0.0239
3: Prop. Matching	0.0883*	0.0417	0.2408*	0.0542
No. of observations	1,189		2,266	

In the second row additional variables are included. To make the comparison between immigrants in Germany and Denmark as close as possible we include the same variables: Fathers education and dummy variables stating whether the immigrant: has attended a language course, came as a refugee, came as a guest worker, is married to a Dane, is married to an immigrant. Due to the use of register data these last two dummies are a little bit different (but probably better) than the German information based on citizenship.

As can be seen from the table these extra variables raise the language estimate slightly among immigrants in the workforce and it practically stays unchanged when all immigrants are included in the analysis. This either indicates that the language estimates are really stable and not biased by unobserved heterogeneity or alternatively that we do not have the proper information to control for the unobserved heterogeneity. In this case it probably reflects that the explanatory variables included in Table 10 allready contain a great deal of information and that the additional information I may need to control for further unobserved heterogeneity is hard to obtain.

To see if the estimates are affected by the choice of methodology, the employment effect has also been calculated by matching. However, a common support problem exists as there are rather few observations among the non-treated with very high propensity scores. All in all there are 17 treated persons with a propensity score above the highest level among the non-treated. There is also a very limited number of observations (6) among the non-treated with propensity scores above 0.90. The consequence of this is that we have a considerable number of treated persons where we miss a good comparison group. There are in other words some migrants with very good language skills that are not comparable with the immigrants who do not speak the host country language. It is not possible to state what the employment effect of the language skills is for this group. I have therefore trimmed the data in a way, so treated respondents are omitted if there are too few non-treated for a comparison. In RFMS-D 15 percent of the treated are omitted.

The result of this matching is shown in the third row in Table 11. Among immigrants in the workforce the estimate only raises slightly to 0.0883, while this tendency is more pronounced among all immigrants, where the estimate raises from 0.1978 to 0.2408. This seems to reflect that the average employment effect is larger among immigrants in Den-

Table 12: Employment probability and language proficiency in Denmark by gender, 1999

	Workforce				All			
	Men		Women		Men		Women	
	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.	Coeff.	StdE.
1: OLS	0.0460*	0.0254	0.1115*	0.0313	0.1817*	0.0305	0.2350*	0.0340
2: OLS+	0.0635*	0.0281	0.1153*	0.0333	0.1844*	0.0331	0.2324*	0.0357
3: PM	0.0695	0.0645	0.1069	0.0710	0.2582*	0.0491	0.2385*	0.0493
No. of obs.	733		456		1,168		1,098	

mark who has actually learned the host country language well than among those who did not learn the language.

To see how the language estimates vary by gender in the Danish case, look at Table 12. As one would expect on basis of Table 11 the results are really stable and not very sensitive to inclusion of additional variables in the second row. The change from an OLS-regression to a matching procedure does not seem to change the estimates among immigrants in the workforce, but the standard error raises somewhat and the effect is no longer significant. Among all immigrants the effect is still significant and for women the estimate is almost unchanged. For immigrant men it raises substantially.

5.3 Employment and language skills - is causality reversed?

Until now we have discussed the relationship between employment and language as if it was given that language skills could increase the probability of employment, but not that being employed could raise the language skills. This is in line with the existing literature that focuses on the effects of unobserved heterogeneity and in some cases also measurement errors.

It seems however plausible that being employed could provide contact with many natives which again could lead to an improvement of the language skills, whereby the causality between employment and language is reversed.

To deal with this causality it would be nice to have a good instrument. However, in this case it is not easy to find, as potential candidates like unemployment in region that could give exogenous variation in employment are easily influenced by moving.

Instead I focus on the Danish data which, as noted in the begining of this paper, in many aspects is richer than in the German case. Firstly, data contains a small panel of 1513 immigrants with information about language skills in both 1999 and 2001. Secondly, extra register data, including labor market participation since 1980, can be added.

To illustrate how the data has been collected see Figure 3. The first wave of interviews was conducted from November 1998 to July 1999. The respondents from the first wave were interviewed again in spring 2001. Information about language skills and employment status at the time of the interviewing is obtained from both surveys. The access to register data gives us information about each respondent's employment history. It is therefore

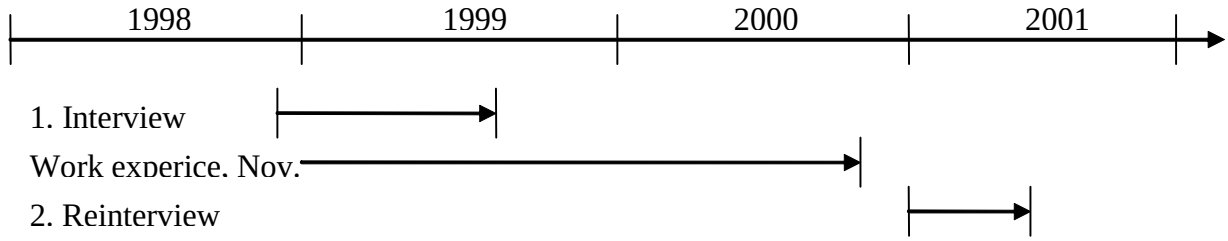


Figure 3: Collection of Data in Denmark

possible to state how much work experience each respondent had in November 2000, shortly before the second interview wave.

Returning once again to the linear probability model I use the panel data to estimate the relationship between language and employment. This time I deal with the unobserved heterogeneity by estimating the first-difference, whereby we control for all individual time-persistent characteristics. The result can be seen from Table 13 and shows that having good or fluent language skills is associated with 7.5 percentage point higher probability of being employed. This is lower than the estimates among all immigrants in Table 11 and hardly supprising as we have now eliminated all the individual time-persistent characteristics. However, we have not yet analyzed the causality between language and employment.

One way of doing this is to look at the immigrants of whom we know that they had no or very little work experience prior to the second wave of interviews, so any language improvement between the two waves could not be caused by employment. Second interview wave was carried out in early spring 2001 and the population is therefore restricted to immigrants who according to the registers had no job experience in Denmark before November 2000. As immigrants who have stayed in Denmark for a very long period and are still without job experience must be expected to differ from the average immigrant I restrict the sample to immigrants who have arrived in Denmark after 1993.

The result is shown in Table 13. Omitting immigrants who have arrived before 1994 and have prior work experience reduces the number of observations to 160. Despite this low number of observations the analysis seems to suggest that language skills have an employment effect. It is very close (6.9) to be significant at the 5 percent level, and would in fact be significant if the model did not include the squared terms age and years since migration.

To investigate to what extent the employment effect differs with work experience and the number of years in the country similar estimates based on immigrants with different work experience and years in the country are shown in Table 14.

Table 13: Employment probability, Linear Probability Models, First-difference. Denmark

	All immigrants interviewed in both surveys			All immigrants arrived after 1993 and without job until ultimo 2000		
	Coeff.	StdE.	P-value	Coeff.	StdE.	P-value
Language proficiency	0.0750*	0.0265	0.005	0.1382	0.0755	0.069
Married	-0.0098	0.0419	0.815	-0.0539	0.1052	0.609
No. of children	-0.0234	0.0192	0.224	-0.0006	0.0418	0.989
$Age^2/100$	-0.0560	0.0427	0.190	-0.0088	0.1024	0.932
Years since $migration^2/100$	-0.0847*	0.0397	0.033	-0.2381	1.2759	0.852
Education:						
Prim./Sec. from host country	0.2117	0.2412	0.380	-0.0013	0.2673	0.996
Vocational from host country	0.2757*	0.0791	0.001	-	-	-
University from host country	0.1561	0.1529	0.005	-	-	-
Good health	0.1494*	0.0370	0.000	0.0709	0.0801	0.377
Constant	0.1765*	0.0650	0.007	0.0716	0.2836	0.801
No. of observations	1513			160		
R^2	0.0333			0.0323		

Table 14: Employment probability, Linear Probability Models, First-difference. Denmark

	Arrived in 1993 or earlier			Arrived after 1993		
	Coeff.	StdE.	P-value	Coeff.	StdE.	P-value
Had no work experience Nov. 2000	0.0439	0.0586	0.454	0.1382	0.0755	0.069
No. of observations	234			160		
Had work experience Nov. 2000	0.0727*	0.0329	0.027	0.1074	0.1088	0.326
No. of observations	960			159		

The results in Table 14 confirm that when estimating the employment effect of language skills for immigrants with no prior work experience in the host country it is important to distinguish between immigrants with short and long duration of stay in the country. And even though the number of observations with short duration of stay and no former work experience is limited the results indicate that language skills do influence employment. The result thereby supports the existing litteratur that focus on the employment effect of language. However, the results do not tell us whether or not there is also a language effect of employment.

6 Conclusion

The purpose of this paper is to assess the importance of immigrants' language proficiency. What determines language proficiency and to what extent do language skills have an effect on employment probability?

The data used in the paper is from surveys conducted among non-Western immigrants in Denmark and Germany. In the Danish case the immigrants were interviewed in 1999 and again in 2001 and the data were afterwards merged with register data. The German survey from 2002 is almost identical to the Danish surveys, but does also contain some information that in Denmark is available from registers. The analysis is restricted to immigrants between 25 and 55 years of age. The Danish data includes 2,260 immigrants in 1999 of whom 1,513 were re-interviewed in 2001. The German data is larger and includes 4,154 immigrants interviewed in 2002.

Following the theoretical model by Chiswick and Miller (1995) determinants of immigrants' language skills are estimated. I find that immigrants that are males or have a good health are more likely to be good at or fluent in the host country language. The same goes for immigrants who have arrived at a young age or have been in the country for a long time. Having obtained education in the home country is also good, but education obtained in the host country is even better. Immigrants from Poland and the former Yugoslavia are in both countries more likely to be proficient in the host country language than Turks, and in Germany this is also the case for Iranians. The number of children and the share of immigrants in the neighborhood are negatively correlated with language proficiency.

These results are rather stable whether we analyze immigrants' abilities to speak, read or write the host country language. But writing (and in Germany also reading) abilities are more strongly correlated with the educational level than the ability to speak the language. These results are very much in line with previous studies of language abilities among immigrants in Germany, UK, US and Australia.

In the analysis concerning the employment effect of being good at or fluent in the host country language I use two different measures of the language skills. Both measures are overall assessments of the respondents' language skills that seem to be closely linked

to the respondents' abilities to speak the language. The first measure is based on the respondents' own assessment of his or hers language skills, while the second is based on the interviewers' assessment.

Estimating the relationship between employment and language in a simple linear probability model, it turns out that the respondents' own assessment of the language skills results in somewhat lower estimation results compared to using the interviewers' assessment. This is probably a result of the interviewers' assessment being a more precise measure of the true language skills. However, this language measure is not perfect either, e.g. because the origin of the interviewers could play a role too, as native interviewers seem to be less critical in their judgment than immigrant interviewers.

In order to assess the causal relationship between employment and language additional variables are added to control for (otherwise) unobserved heterogeneity and a matching procedure is used. Including the additional control variables lowers the employment effect of language proficiency somewhat in Germany, but not in Denmark. Using a matching procedure instead of OLS raises the estimates for both men and women in Denmark and for women in Germany. This could suggest that those immigrants that have learned the host country language well are those for whom it is most beneficial. Still, when this seems to be less the case among immigrant men in Germany it might also reflect the structural differences between Denmark and Germany, where the net replacement rate in Denmark is higher for the low skilled and publicly funded language courses are very common, which makes it less important to find a job right away than it is for the breadwinner in a German household.

However, what influences the employment effect of language skills the most is who the analysis includes. If only immigrants in the workforce are considered, that is individuals in job and individuals searching for a job, then the effect is 0.04 in Germany and 0.09 in Denmark, whereas the effect is 0.15 and 0.24, respectively, if all immigrants are considered. This reflects that excluding all immigrants who are not searching for a job and thus are outside the workforce will tend to underestimate the effect of language proficiency, as improving language skills not only can influence whether the immigrants become employed or not, but also whether they join the workforce. On the other hand including all immigrants will be expected to overestimate the importance of language proficiency as the sample becomes more heterogeneous and it becomes more difficult to control for all the unobserved characteristics.

To deal with measurement errors in the language variable I use an instrument originally proposed by Dustman and Fabbri (2003): whether or not the interview is conducted in the host country language. It turns out that this instrument only works in the German case. The instrument is too weak in the Danish case, where the interviews have been conducted by immigrant interviewers. Because a change in interview language has been "costless" and might also depend on the interviewers' preferences. Yet it might also be in

the German case, where the interviewers seem to be less critical, that the measurement error is largest. It turns out that the employment effect of language proficiency nearly doubles in Germany, when dealing with the measurement error in the language variable.

In the final section I discuss the causality between employment and language. It seems to be taken for given in much of the existing literature that language has an effect on employment, but not that being employed could improve the language skills. The first results among immigrants with no former job experience seem to suggest that improved language abilities prior to any employment seem to increase the subsequent employment chances of immigrants, which suggest the existence of causality linked from language skills to employment prospects. The result thereby supports the existing literature.

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