Are immigrants and descendants with ill health more prone to unemployment? Evidence from 18 European countries

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Abstract

ARE IMMIGRANTS AND DESCENDANTS WITH ILL HEALTH MORE PRONE TO UNEMPLOYMENT? EVIDENCE FROM 18 EUROPEAN COUNTRIES

Objective: Previous research has established that both ill health and minority status is associated with unemployment. Less is known, however, about the interplay between having ill health and being from minority background. The present study examines whether immigrants and descendants with ill health are particularly prone to unemployment during an economic downturn in Europe. **Design:** The EU-SILC cross-sectional data material is utilized, and linear probability models are estimated. The analysis is run for countries in which the two minority samples are acceptably large (N=>100), resulting in 18 included European countries. The year 2011 is chosen because it is possible to identify both immigrants and descendants in EU-SILC due to a module on intergenerational transfer of disadvantages. **Results:** The results indicate – as expected – that both ill health and minority status is independently related to higher unemployment likelihood. Immigrants and descendants with ill health, however, are not particularly likely to be unemployed. This finding is robust to a number of sensitivity tests, and the empirical pattern is very similar across the 18 included countries. **Conclusion:** Both minority status and ill health is associated with high unemployment probability in Europe. However, there does not seem to exist a 'double disadvantage' for immigrants and descendants with ill health, which is in line with a human capital perspective on how employers evaluate potential employees. Both a non-native sounding name and bad health status is interpreted as a risk factor, but there is no reason to expect ill health to lower the productivity level more if the applicant is a descendant or immigrant.

Keywords: Europe; Unemployment; Ill health; Health selection; Immigrant; Descendant.

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Introduction

In the aftermath of the US housing market collapse in 2007/ 2008, a severe economic downturn appeared in Europe, resulting in a rapid increase in unemployment rates in several countries. In the 28 EU member countries as a whole, there were approximately 26.5 million people registered as unemployed in May 2013 (Eurostat 2015a). To have a noticeable 'gap' in the résumé will make re-entry to employment more difficult, as employers are likely to interpret unemployment episodes as a signal of low expected productivity. Unsurprisingly, there exists a robust statistical association between previous unemployment experience and subsequently loose labor market attachment (Gangl 2006; Eliason and Storrie 2006). Evidence from field experiments have recently shown this association to be of a causal nature: people with unemployment experience get fewer positive responses from employers (Eriksson and Rooth 2014; Kroft, Lange and Notowidigdo 2013). Moreover, the unemployment experience is associated with feelings of inferiority and shame (Walker et al. 2013; Rantakeisu et al., 1999), and might even lead to a worsening of health status (Cooper, McCausland, and Theodossiou 2006; Montgomery et al. 1999).

Since unemployment is correlated with several negative events, it is important to investigate whether certain groups of people are overrepresented among the unemployed. The present study will examine whether immigrants and descendants with ill health are particularly prone to unemployment. The cross-sectional part of the EU-SILC data material is utilized, and linear probability models (OLS) are estimated. The 2011 version of EU-SILC is chosen, in which it is possible to identify both immigrants and descendants. The analysis is

run for countries where there are over 100 observations for both minority groups, resulting in 18 included countries.

Both ill health and a non-native sounding name is associated with unemployment (more on this below). Less is known, however, about *the interplay* between ill health and minority status, which is the focus of the present paper. From a theoretical point of view, there are three possible ways in which the interaction will 'play out' empirically (Pedulla 2014). Firstly, in an *additive* manner, which is in line with a human capital perspective on how employers evaluate potential employees. To have ill health is likely to lower the productivity level, but it will do so in a similar manner regardless of country background. Secondly, the interplay could operate in a *multiplicative* manner. The negative stereotypes related to having minority background could be amplified in the presence of more negative information (bad health). Thirdly, the interaction effect could manifest itself in a *diminishing* manner. The presence of additional negative information (ill health) about a member of a highly stigmatized group (minorities) could have little impact, and to have bad health might therefore be more detrimental for natives' labor market outcomes. This study will investigate which of these three possibilities best fit the data material at hand.

The following overarching research question will be pursued: *Are immigrants and descendants with ill health particularly prone to unemployment in 18 European countries in 2011?* The interaction between ill health and minority status has been investigated to some extent in labor market research previously, but this study adds on two domains. *Firstly*, through investigations of the unemployment risk for both immigrants and descendants with ill health. It is important to include descendants as a separate group, as they often have difficulties in gaining firm attachment to the labor market. *Secondly*, with an explicit comparative focus, where results will be compared across the European labor market.

Previous research on this topic has used data from merely one country, and it is hence difficult to know whether the findings are relevant for other national contexts as well.

Theory and previous research

Hiring, firing and unemployment

The outcome of the current study is *unemployment*, a destination that consists of two main processes: who is *hired*, and who is *fired*. Employers' evaluations of job candidates' expected productivity level is important in the former process, and employers will therefore search for (imprecise) productivity signals (e.g. sickness absence, non-native sounding name, etc.). The firing process is particularly important during an economic downturn, when many businesses have to downsize, or are closed. In these circumstances, the 'last-in-first-out' (LIFO) seniority principle ensures that those who were hired last are fired first (Lindbeck 1994, von Below and Thoursie 2010). Consequently, people with minority background and/ or ill health might – partly – have a high firing likelihood because they are disadvantaged in the hiring process. Analysis of data from Germany and the U.K. actually point to this being the case: immigrants are more prone to dismissals than the majority population. (Dustmann, Glitz and Vogel 2010).

Ethnic discrimination and health selection

Why are minorities disadvantaged on the labor market? Lack of country-specific human capital is obviously important for *immigrants*, e.g. language difficulties and minimal knowledge about the institutional setting in the 'host country'. However, this argument cannot necessarily be extended to *descendants*. Having all education and work experience from the host country, descendants should – in principle – be as employable as their peers with

majority background are. Yet, if there exists discriminatory preferences/ practices (Phelps 1972; Becker 1971) – or implicit bias against members of 'out-groups' (Jost et al. 2009) – among employers, descendants could be recruited to a lesser extent. In fact, recent evidence from field experiments points to this being the case. Several studies have established the presence of ethnic discrimination in the hiring process, among both immigrants and descendants (e.g. Blommaert, Coenders and Tubergen 2014; Bursell 2014; Jacquemet and Yannelis 2012; Carlsson and Rooth 2007). Apparently, a non-native sounding name is damaging while applying for jobs.

What about people with ill health, why should their labor market attachment be an issue? Health status could act as a proxy for expected productivity level of the applicant, and hence lead employers to rather hire (or, while downsizing, keep on the payroll) people with good health status. Risk aversion is also involved: The person with ill health might be prone to high sickness absence, and could even deteriorate further in health. Previous research have shown that people with health problems have a rather loose labor market attachment. Health selection is evident both as a heightened unemployment likelihood (Butterworth et al. 2012; Arrow 1996; Mastekaasa 1996) and as a lower probability of having or gaining employment (Schuring et al. 2013; García-Gómez, Jones and Rice 2010). It should be stressed, however, that there are cross-national differences in the extent to which ill health is associated with weak labor market attachment (Heggebø 2015; Schuring et al. 2007), indicating that certain policies and labor market contexts are more beneficial for people with health problems.

To summarize, previous research has established the presence of both ethnic discrimination and health selection on the labor market. We know less about how ill health and minority status *interacts*, which is the topic of the next section.

Ill health and minority status – the interplay

An important question to ask is whether health status is comparable between individuals belonging to majority and minority groups in Europe (e.g. the 'healthy immigrant effect'). Results from previous research is somewhat mixed (see Nielsen and Krasnik 2010 for a review). Some find that immigrants and descendants are more vulnerable to certain diseases and health problems (Dinesen et al. 2011; Hjörleifsdottir Steiner et al. 2007), where others find small differences once socioeconomic factors are accounted for (Lorant, Van Oyen and Thomas 2008; Cooper 2002). According to the current data material, there are negligible differences between the majority, immigrants and descendants in the prevalence of limiting longstanding illness (LLSI) (see table 2). There are some noticeable exceptions: immigrants report somewhat less LLSI in Germany, Hungary, Spain and the U.K, whereas the opposite is the case in Estonia, Latvia, Lithuania and Slovenia. Furthermore, descendants report somewhat more LLSI in the Czech Republic, Germany and Spain. In general, however, health status seems to be comparable across the three groups.

Immigrants, health and employment status has received some attention in previous research. An early study from Germany found that migrant unemployed workers had worse health status than their native counterparts (Elkeles and Seifert 1996). A more recent paper from Australia showed unemployment to be associated with poor mental health for immigrants (Kennedy and McDonald 2006). Lastly, a paper from Denmark is very relevant for our purpose (Jakobsen and Larsen 2010). The authors find – using register data and the general practitioner's referral behavior as an instrumental variable – that the negative causal effect of health on employment probabilities is larger for immigrants than natives.

From a theoretical point of view, the combination of minority status and ill health could have an impact on unemployment probability in three ways (Pedulla 2014). Firstly, in an *additive* manner. This is in line with a human capital perspective on how employers

evaluate potential employees. To have ill health is likely – on average – to lower a person's productivity level, for instance through high sickness absence and/ or reduced work capacity. However, the lowering of productivity will be similar regardless of country background, and ill health should therefore not be particularly damaging for immigrants and descendants. Secondly, the interplay could operate in a *multiplicative* manner. The (potential) negative stereotypes related to having minority background could be strengthened when it is accompanied by more 'negative' information (bad health status). Hence, to have a combination of two undesirable signals is – from an employer's point of view – especially worrying, and the unemployment probability will hence be significantly higher than if the person had only one of the negative 'traits'. Thirdly, the interaction effect could manifest itself in a *diminishing* manner. The presence of additional negative information (ill health) about a member of a highly stigmatized group (immigrants) could prove to have little impact. Employers are so preoccupied with the non-native sounding name that a bad health status will 'slip under the radar', so to speak. Thus, it is possible that having bad health is more detrimental for natives' labor market outcomes.

It is important to emphasize that we do not observe the hiring process directly in the current data material (as in a field experiment), and it is therefore impossible to know how employers actually evaluate candidates. Furthermore, there is some uncertainty regarding the extent to which employers can observe health status of the applicants, given that it is illegal to ask about health issues in job interviews in many countries. Previous (major) health impairments are likely to manifest itself as gaps in résumés, which is easy for employers to observe. Additionally, employers can lean on 'imprecise' health signals (e.g. being obese/underweight or shortness of breath) while interviewing candidates.

Heterogeneity across Europe

Only countries with over 100 observations for both minority samples are included in this study. 100 is chosen as cut-off point because 10-25 percent of the sample typically report ill health, and we therefore need at least 100 observations in order to produce reliable statistics. 12 countries were excluded because the descendant and immigrant samples were too small (e.g. 49 descendants in Portugal and 37 immigrants in Bulgaria, see table A1), and Ireland were dropped because of a very low number of descendants reporting ill health (N=9). Hence, the following 18 European countries are included: Austria, Belgium, Croatia, Czech Republic, Estonia, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Slovenia, Spain, Switzerland, and the United Kingdom.

These countries differ enormously in how high the *unemployment rate* was in 2011, where Latvia (16.2 %) and Spain (21.4 %) represents obvious 'crisis countries' (Eurostat 2015b). Labor demand is much higher in the Netherlands (5.0 %) and Norway (3.3 %), and on an intermediate level in Belgium (7.2 %) and the U.K. (8.1 %). It will be interesting to see whether there are cross-national similarities in results according to the severity of the economic crisis. It might be the case, for instance, that immigrants and descendants with ill health do comparatively better in countries where the unemployment rate is low.

A second important issue is the *composition* of the immigrant and descendant population in the included countries. The immigration history is diverse across Europe, and the minority groups differ extensively cross-nationally both on country of origin and reason for immigration. It is probably harder for people originating from 'non-Western' countries to get a firm attachment to the labor market in Europe, at least compared with intra-European mobility. In addition, even separating between Western- and non-Western immigrants is likely to conceal considerable heterogeneity in educational level, health status and other

characteristics. In other words, the specific source country of immigration is probably of major importance. There is also reason to believe that (highly skilled) labor immigrants are unemployed to a lesser extent than more vulnerable immigrant groups (e.g. refugees). Unfortunately, it is not possible to disentangle neither exact country background nor reason for immigration in the EU-SILC data, and this study can therefore not examine this issue in detail.

Furthermore, the unemployment experience is likely to vary between the included countries due to differing labor market institutions (e.g. active labor market policies) and political solutions to the economic downturn (e.g. the implementing of austerity measures). Because of this vast cross-country heterogeneity, all of the following regressions are run separately for each country.

Data, method and analysis

Data

The data material consist of the cross-sectional part of EU-SILC, which includes information about employment status, health and demographics. Moreover, due to a 2011-specific module on intergenerational transmission of disadvantages, it is possible to identify both *immigrants* and *descendants*. Hence, we can establish whether immigrants and descendants (with ill health) have a higher risk of unemployment.

The sample size varies from 2736 (Norway) to 21 237 (Italy), but is typically around 4-7000 (in 12/18 countries, see table 1). The EU-SILC sampling unit varies between dwellings (e.g. Spain), households (e.g. Belgium), and individuals (e.g. the Netherlands) (Eurostat 2015c). Similarly, the mode of data collection varies between paper-assisted personal (e.g. Hungary), computer-assisted personal (e.g. U.K.), computer-assisted telephone

(e.g. Switzerland), and self-administered interview (Germany), or a combination (e.g. Latvia). Computer-assisted personal interview is most common among the 18 countries included in the present study. Nonetheless, the EU-SILC is harmonized for comparative purposes, and is therefore well suited for examinations of cross-national similarities/differences. Sample weights are not used because the analysis is run on a subsample (i.e. only those participating on the 2011-specific module, see analysis section).

Unfortunately, there is no overall information on unit non-response and attrition available in EU-SILC, but evidence from the Norwegian part indicates that old age and low education is related to both (Wilhelmsen 2012). The tendency for 'vulnerable groups' to have a higher non-response could obviously affect the results. For instance, immigrants with inferior language skills are probably less likely to participate in the surveys, implying positively selected immigrant samples. People with the most serious health conditions are most likely not able to participate either, and we need to remember this while interpreting the results.

The present data material has three major shortcomings. Firstly, the cross-sectional structure implies that causal inference is impossible, and the analyses will only provide descriptions of the statistical associations in question. Secondly, there is a rather low number of observations for some of the minority groups (see table A1), which prevents firm conclusions. Thirdly, the utilized information is self-reported, and could therefore be prone to errors. A discussion of the extent to which these shortcomings will bias the results is included towards the end of the paper.

Operationalization

Dependent variable in the following analysis is *unemployment*. Respondents answering 'unemployed' on a question regarding current economic status are coded 1 (else=0). An alternative unemployment measure – quite similar to ILO's definition – is used as a sensitivity test. This binary variable consists of to two questions: (i) 'actively searching for a job?', and (ii) 'available for work in the next two weeks?' People answering yes on both are coded 1 (else=0). The correlation between the two unemployment measures is quite high overall (0.739), varying from 0.517 (Netherlands) to 0.878 (Lithuania).

Two different health measures are used. *LLSI* is computed from two questions: (i) 'Suffer from any chronic (longstanding) illness or condition?', and (ii) 'Limitations in activities people usually do because of health problems for at least the last six months?' Respondents answering 'yes' on both are coded 1 (else=0). *Bad/fair health* is derived from a general health status question, and people stating health to be very bad, bad or fair are coded 1 (else=0). Those with fair health are included because few people report to have very bad or bad health (e.g. 3.87 and 4.83 percent for Spain and the U.K., respectively), implying low statistical power for the interaction terms of interest.

LLSI should capture quite serious illnesses and health impairments, which in several cases will be easy for (potential) employers to observe. *Bad/fair health*, on the other hand, will mainly reflect respondents' self-perceived fitness and psychosocial well-being (Blaxter 2005: 53-54). The correlation between the two health measures is quite high for all countries pooled (0.563), and below 0.5 in merely five countries: Croatia (0.467), Latvia (0.489), Lithuania (0.373), Luxembourg (0.483), and Switzerland (0.498). Yet, the correlation is not perfect, reflecting that the measures do in fact pick up somewhat differing aspects of health. The *LLSI* measure is preferred due to considerably less cross-national variation, which eases the comparison of results. The share of majority individuals reporting to have LLSI ranges

from 9.66 (Luxembourg) to 23.30 (Estonia), whereas the corresponding range for bad/fair health is 12.40 (Switzerland) to 51.22 (Lithuania). The *bad/fair health* measure will, however, be used in order to check the robustness of the results.

Minority background is captured by two dummy variables. Respondents stating not being born in the host country are coded 1 (else=0) on *immigrant* status. The current immigrant measure is hence quite sensitive, since people arriving to the host country at an early age are included. This could imply that the immigrant samples are positively selected, since an unknown number could have lived almost their entire life in the host country. Respondents who state that they are born in the host country but their mother is born abroad, are coded 1 on the *descendant* variable (else=0). It is important to include descendants as a separate category, since they face disadvantages on the labor market due to discrimination (see above). Hence, to include descendants in the majority group will yield downwardly biased results (i.e. the difference in unemployment probability between immigrants and the majority will appear to be smaller than it actually is).

In order to get as high a number of observations as possible, both people with a background from European and non-European countries are included in the two minority measures. Again, this could mean that the two minority samples are positively selected, since people stemming from other European countries probably experience fewer labor market disadvantages . We will investigate this through supplemental analysis of four countries (France, The Netherlands, Spain, and the U.K.) for which the minority samples are large enough to only include non-European minorities.

A number of covariates is also included. Educational level consists of two dummy variables computed from a question on highest education attained. Pre-primary, primary and lower secondary is collapsed to *primary education*, while (upper) secondary and post-

secondary non-tertiary is collapsed to *secondary education* (higher education = reference category). Health and age is correlated, as people's health tend to deteriorate in old age. *Age* and *age squared* is included to adjust for this tendency. Those who report to be *married* are coded 1 (else = 0). Women tend to report more health issues than men do (Kroenke and Spitzer 1998), and a dummy denoting 1 for *woman* is therefore included (men=0).

Descriptive statistics

Table 1 below presents descriptive statistics, split by country. The unemployment prevalence is very high in Croatia, Latvia and Spain (16-20 percent), and on a low level in the Netherlands, Norway and Switzerland (roughly 2 percent). As noted above, there is much less cross-country differences in LLSI than in bad/fair health, implying that the former measure is better suited for comparative purposes. The prevalence of higher educational qualifications ranges from 14.73 percent (Croatia) to 45.07 (Norway). The age distribution is very similar between the included countries. Gender skewness is largest in Croatia, the Czech Republic, and Estonia, where roughly 57 percent are women. In all countries, over 50 percent of the sample is married (highest prevalence in Lithuania: 73.42).

Table 2 presents descriptive statistics on the preferred independent (LLSI) and dependent (unemployment) variable, split by minority background. In all 18 countries, *immigrants* are unemployed to a higher extent than the majority, although the differences are quite small in some cases (e.g. Hungary). The relative difference is especially large in Luxembourg (2.38 vs. 6.45) and Norway (1.60 vs. 7.32), while Spain stand out in absolute terms (15.36 vs. 24.49). The picture is more complicated for *descendants*. Typically, the unemployment prevalence is between that of immigrants and the majority (e.g. Austria, France, and Norway). In some cases, descendants report unemployment to a higher extent

than immigrants do (e.g. Belgium, Estonia, the Netherlands, and Slovenia), or to a lower extent than the majority (Hungary, Italy, Spain, and the U.K). As mentioned earlier, there are quite small differences across ethnic background in LLSI prevalence.

Overall, there are small differences between the majority, immigrants and descendants in the included covariates (see table A2 in appendix). In 10 countries, higher education is similar across the three samples. Holding higher educational qualification is more common among immigrants in the Czech Republic, Hungary, Luxembourg, Switzerland and the U.K., perhaps indicating that the immigrant samples are positively selected. Higher education is more prevalent among descendants in Hungary, Italy and the U.K., but less prevalent among immigrants in Slovenia and Spain. The age distribution is very similar, the mere exception being immigrants in Estonia and Latvia (somewhat older). Immigrants are married to a larger extent in 16 countries (not in Czech Republic and the Netherlands), whereas descendants in most cases are similar to the majority. Finally, there are no major differences in the gender distribution, apart from descendants in Norway, where males are overrepresented.

-- Table 1 and 2 here --

Analysis

Ordinary least square (OLS) regression analysis is performed throughout, despite the dependent variable being dichotomous. Logistic regression is not preferred because of well-known difficulties in comparing results across different models, groups, and samples (Mood 2010; Allison 1999). Nonetheless, logistic regression is run as well, in order to see whether the results are sensitive to the choice of a linear model.

Not everyone that answered the survey participated in the module on intergenerational transfer of disadvantages, in which the question on mothers' birth country is included. These

individuals are dropped from the sample, along with people not answering the health questions. Only people in the age span 26 to 60 were eligible to participate in the 2011-specific module, and the results of this study will therefore not be generalizable to the young (<26) and old (>60).

First, we examine whether immigrants and descendants with ill health have a higher unemployment probability than people of majority background (on pooled data). Afterwards, the analysis is split by minority background (i.e. run separately for the majority, immigrant, and descendant group), in order to investigate the impact of health on unemployment probability within each group. Lastly, the analysis is split by gender, and a number of additional robustness checks (change of dependent and independent variable, logistic regression analysis, rerun analysis on non-European minority samples) are performed.

Results

Health selection to unemployment among immigrants and descendants

Results from an OLS regression of unemployment by LLSI, minority status (immigrant and descendant) and interaction terms between LLSI and minority status is presented in table 3. Age, age squared, primary and secondary education, marital status and gender are included as covariates. All results are presented split by country.

Majority individuals (the reference group) reporting limiting longstanding illness (LLSI) are significantly more likely to be unemployed in 9 of the 18 investigated countries. The size of the coefficient is considerable: people with LLSI are, in several cases, roughly 2—7 percent more likely to be unemployed. Immigrants without health problems have a significantly higher unemployment probability in 12 of the countries, and the effect size is often quite large (fluctuates between 3—9 percent). The results are more mixed for 'healthy'

descendants. In both Spain and Italy, descendants are significantly *less* likely to be unemployed (compared with 'healthy' majority individuals). However, the descendant coefficient is positive and significant in 8 cases, indicating that even minorities born and raised in the host country struggle with labor market attachment. Descendants are 2—9 percent more likely to be unemployed in most European countries.

-- Table 3 here --

Turning to the interplay between ill health and minority status, we see a clear pattern: *very few of the interaction terms are statistically significant*. For immigrants, there are four exceptions. The interaction is positive and significant in the Czech Republic, Luxembourg and Switzerland, but negative and significant in Germany. There are four exceptions for descendants as well: a significant and positive coefficient in Norway, Luxembourg and Spain, and a negative one in the Netherlands. Most often, however, the interaction term for minority status and LLSI is quite small, and far from significant.

In summary, both having ill health and being an immigrant/ descendant is independently associated with unemployment. Then again, there are few signs of a 'double disadvantage' for minority individuals with ill health. However, to compare immigrants and descendants with majority respondents could be misleading, since both unemployment prevalence and health status differs somewhat (see table 2). It might be equally rewarding to explore the statistical relationship within each of the three groups, and compare the ill health-coefficient to see among which of them the association is most pronounced. The analysis split by minority status is presented in table 4.

-- Table 4 here --

Starting with the majority sample (model 1), we see that the LLSI coefficient is statistically significant and positive in 11 of the included countries (controlling for age,

education, gender and marital status). The exceptions are Croatia, Estonia, Hungary, Latvia, Lithuania, Spain and the U.K. The picture is different for immigrants (model 2), where the LLSI coefficient is significant in merely six cases: Austria, Belgium, Czech Republic, Luxembourg, Slovenia and Switzerland. The same is true for five countries when we turn to descendants (model 3): Austria, Germany, Luxembourg, Norway and Spain. It should be stressed, however, that although the LLSI coefficient more often reaches statistical significance among the majority, the point estimate is similar or larger in the two minority samples in some cases (e.g. Belgium, France, Germany, Italy and Norway). A smaller sample size might therefore explain why ill health more often is significantly associated with unemployment among the majority population.

The relationship between ill health and unemployment is particularly noticeable in Austria, Belgium and Luxembourg, where the LLSI coefficient is quite large for all three samples. This is also the case in Norway (immigrants and descendants) and Germany (majority and descendants). In several instances, having ill health increases the unemployment probability with 6—9 percent. The largest 'health penalty' is observed among descendants in Austria, Norway, and Spain, who are 12, 13, and 16 percent more likely to be unemployed, respectively. Similarly, immigrants with ill health have high unemployment likelihood in Austria, Belgium, Czech Republic, Luxembourg and Slovenia (6.8—10.5 percent).

Overall, the presented results indicate that immigrant/descendant status and ill health interacts in an *additive* manner. Before we conclude on this matter, however, we turn to a number of sensitivity tests.

Robustness checks

There might be a gender component in the unemployment probability for immigrants and descendants with ill health, and the regression have therefore been run separately for men and women (see table A3). The main pattern of few significant interaction effects is confirmed: in only 9 (out of 72) cases is the interplay positive and significantly different from zero. In five more cases is the interaction *negative* and significant. There is no coherent pattern regarding gender differences, and the main finding is still a lack of interplay.

A number of further sensitivity tests have been performed, with both changes of the independent and dependent variable (table A4), and rerunning the analysis using logistic regression (table A5). When the health measure is changed to *bad/fair health*, there are even less statistically significant interaction effects for both immigrants (positive in Norway, negative in Germany) and descendants (positive in Austria, Luxembourg and Spain, negative in the Netherlands). Similarly, with the outcome changed more in line with the *ILO unemployment* definition, there is also few positive and significant interplays (Italy, Luxembourg and Switzerland for immigrants, Luxembourg and Norway for descendants). Furthermore, the results from logistic regression analysis point to there being only three significant interaction terms overall (positive for descendants in Spain, and negative in Austria and Germany for immigrants).

The two minority samples could be positively selected, since people with European background are included. The potentially biasing effect of this choice is investigated in table 5, where the analysis is rerun for four countries – France, Netherlands, Spain, and the U.K. – in which the non-European minority samples are acceptably large (at least 100 immigrants and 100 descendants from non-European countries, see table A6). Table 5 shows the coefficients for non-European immigrants and descendants (model 1), compared with the results derived from table 3 above (model 2). The empirical pattern is, basically, identical.

The most apparent change is that the *immigrant* coefficient becomes somewhat larger for all four countries, as expected. The interaction terms hardly change, except for immigrant*LLSI in Spain (which now becomes statistically significant). The results are similar when European immigrants and descendants are dropped from the sample altogether (available on request).

-- Table 5 here --

In summary, neither choice of (in)dependent variable nor analysis method is responsible for the main result, namely that there are *few signs of an interaction effect between having ill health and minority background*. This finding is similar for men and women, and the fact that we have included immigrants and descendants with European background does apparently not matter either. The following and last section will discuss the results in more detail, and summarize some of the most obvious shortcoming of this study.

Discussion

There are two main findings in this study. *Firstly*, ill health and minority status is – independently – associated with unemployment probability in several European countries. This fits well with previous research, showing the presence of both health selection and ethnic discrimination on the labor market. *Secondly*, there is very limited evidence of a significant interaction effect between having ill health and being part of a minority group: Immigrants and descendants with bad health status are not particularly prone to unemployment. The results are quite similar across the 18 included European countries, and there is no evidence of the association being influenced by how high the national unemployment rate is.

The empirical findings indicate that ill health and minority status interacts in an *additive* manner, at least among 26-60 year olds in the 18 included European countries. This

is in line with a human capital perspective on how employers evaluate (potential) employees. Having a non-native sounding name is seen as a risk factor, and probably acts as an imprecise proxy for language abilities and cultural competence. In a similar vein, health problems are interpreted as a sign of lower expected productivity (e.g. through high sickness absence). However, there is no reason for employers to suspect that the impact of bad health on the productivity level depends on the persons' country background. Keep in mind that both immigrants and descendants are quite likely to be unemployed in the first place, and 'ceiling effects' therefore limit the potential interaction with ill health (i.e. the unemployment probability cannot rise endlessly). Nevertheless, it is quite striking that the (lack of) interplay is similar regardless of whether 'healthy' immigrants and descendant are prone to unemployment or not (e.g. compare France and the U.K.).

It is important to stress that even though descendants and immigrants with ill health do not face a 'double disadvantage' in the current data, they might still be overrepresented among people who are *long-term* unemployed. Unfortunately, the EU-SILC data is not detailed enough in order for us to investigate this thoroughly. Moreover, the immigrant samples are probably *positively selected* (which would imply downwardly biased results), for two reasons. First, the immigrant definition applied in this paper includes people who could have lived almost their entire life in the host country. Second, 'vulnerable groups' tends to have a higher non-response in surveys, meaning that both immigrants with inferior language skills and people with the most serious health impairments probably are left out. The inclusion of immigrants and descendants with European background is unlikely to bias the presented findings much, as shown by the supplemental analysis in table 5. Some uncertainty remains, however, as we are unable to locate the exact source country of immigration.

There are at least three serious limitations of the current study. First, the *low number of observations*, particularly for the descendant samples (see table A1). Hence, there might

not be enough statistical power in order for us to locate the interplay of interest. However, the interaction terms are negative in a number of cases, indicating that a low number of observations is not the only explanation. Second, *omitted variable bias* is a concern. Causal inference is not possible because the data material is cross-sectional. Hence, this paper only reports conditional correlations, and we do not know whether ill health and/or minority status is the *cause* of the unemployment experience. On the contrary, there is most likely a range of unobserved factors (correlated with the independent variables) able to generate this relationship (e.g. personality characteristics). Third, *reverse causation* is a concern: health status could deteriorate because of the unemployment experience. It seems highly unlikely, however, that unemployment is the sole reason for health status being poor, since a number of econometric analyses have shown few signs of negative health effects of unemployment (Schmitz 2011; Böckerman and Ilmakunnas 2009; Salm 2009).

Third, the information is *self-reported*, and therefore prone to error. Unemployed individuals might exaggerate their health problems in an effort to rationalize why they are currently out of a job, for instance. Furthermore, immigrants and descendants who report ill health could – objectively – have worse health compared to the majority population. Previous research from the U.K. (Chandola and Jenkinson 2000) and the Netherlands (Agyemang et al. 2006) disagree on the subject. The association between self-rated health and mortality is similar across socioeconomic groups in Sweden (Burström and Fredlund 2001), while LLSI reported by working class (compared to middle class) male respondents in Norway tend to be of a more serious kind (Elstad 1996). Overall, this could indicate that 'vulnerable groups' (e.g. immigrants, the low educated) are inclined to *underreport* health problems, perhaps leading to downwardly biased results in the current study. We cannot test this directly, but the fact that the empirical pattern was robust to a number of sensitivity tests gives us more confidence in the results.

Future research on the interplay between ill health and minority status should pursue down two main streams. Firstly, using administrative registers covering the whole population, which allows for more vigorous statistical testing. Secondly, field experiments – where ill health and minority status are included as 'treatment variables' while applying for jobs – would be a great supplement to the existing literature. Many redundancies in Europe during the economic downturn are related to last-in-first-out seniority rules, and it is therefore essential to investigate the hiring process if we want to fully understand the mechanisms behind the unemployment experience.

The results from this paper have some important policy implications. First, it is worrying to observe that descendants – who have all education and work experience from the 'host country' – are overrepresented among the unemployed in 8 European countries. This is partly because of discrimination in the hiring process, perhaps indicating that *anonymous job applications* should be introduced. Second, people with ill health have significantly higher unemployment likelihood in 9 European countries. Bad health status is apparently an obstacle for firm labor market attachment, probably because employers worry about the risks involved in hiring someone with health impairments. A (temporary) *wage subsidy* could improve the situation for those with health problems. Wage subsidizing (along with *language training*) is also a possible solution for immigrants, who are prone to unemployment in 12 of the 18 European countries investigated in this study.

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Key messages

(1) Both immigrants and descendants are prone to unemployment in Europe.

(2) Having ill health is associated with a high unemployment probability in several European countries.

(3) Immigrants and descendants with ill health, however, are not particularly likely to be unemployed.

Tables

Table 1. Descriptive statistics in 18 European countries. Percent.

	Unemp.	LLSI	Bad/fair health	Higher educ.	Age	Women	Married
Austria (6713)	5.27	17.88	23.10	22.58	43.92	52.38	59.17
Belgium (6108)	8.02	13.77	19.25	42.11	43.28	51.49	57.11
Croatia (4262)	20.39	17.93	43.78	14.73	47.24	57.48	72.71
Czech Republic (7047)	6.43	14.60	28.75	17.37	44.19	57.56	62.54
Estonia (4544)	10.92	23.99	39.13	32.99	44.25	57.17	52.99
France (11913)	6.94	15.55	25.69	33.43	44.06	51.70	56.65
Germany (13066)	6.16	17.11	27.69	38.09	45.20	53.05	62.83
Hungary (14179)	10.05	18.64	36.53	21.39	44.40	53.10	58.76
Italy (21237)	9.21	11.82	21.85	17.46	43.86	51.42	63.92
Latvia (6811)	17.88	20.67	49.02	27.47	44.21	54.18	50.27
Lithuania (4888)	13.22	13.46	51.96	31.14	46.57	56.20	73.42
Luxembourg (7329)	4.49	9.74	24.12	28.00	43.13	51.71	67.21
Netherlands (6122)	2.01	16.50	17.10	40.30	44.37	53.48	57.06
Norway (2736)	2.12	13.63	20.80	45.07	43.81	46.38	53.51
Slovenia (5249)	11.26	20.50	31.24	26.14	42.84	52.24	56.28
Spain (16606)	16.28	11.18	16.45	31.83	43.63	51.49	64.80
Switzerland (7293)	1.76	14.11	13.68	32.54	44.51	53.86	63.98
United Kingdom (6857)	3.81	18.04	19.31	40.91	43.81	55.32	59.72

Notes EU-SILC cross sectional data material 2011.

Number of observations presented in parentheses.

Descriptive statistics on the covariates (higher education, age, married and woman) split by minority background in table A2 in appendix.

Table 2. Descriptive statistics on unemployment and LLSI in 18 European countries, by minority background. Percent.

	Unemployed			LLSI		
	Majority	Immigrant	Descendant	Majority	Immigrant	Descendant
Austria	4.31	10.08	7.72	17.42	20.16	18.10
Belgium	7.03	12.77	15.50	13.30	15.99	16.08
Croatia	20.03	22.99	22.78	17.86	18.39	17.09
Czech Republic	6.34	9.13	9.61	14.58	15.22	21.62
Estonia	10.43	14.82	17.10	23.30	29.45	25.91
France	6.41	11.62	8.92	15.27	17.97	12.14
Germany	6.03	8.05	6.27	17.34	13.82	21.45
Hungary	10.04	11.33	7.35	18.69	14.00	21.32
Italy	8.89	12.51	5.39	11.88	11.28	10.78
Latvia	17.74	18.90	19.25	20.08	24.88	23.36
Lithuania	13.05	15.69	21.80	13.25	16.67	9.77
Luxembourg	2.38	6.45	4.48	9.66	9.82	8.40
Netherlands	1.94	3.08	5.45	16.50	16.41	20.45
Norway	1.60	7.32	4.67	13.65	13.41	12.15
Slovenia	10.96	13.60	14.95	19.82	25.70	18.21
Spain	15.36	24.49	14.68	11.74	6.18	18.35
Switzerland	1.30	3.27	1.55	13.65	15.65	13.26
United Kingdom	3.63	4.99	2.65	18.83	12.70	16.71

Notes EU-SILC cross sectional data material 2011.

Number of observations split by minority background in table A1.

Table 3. Results from OLS regression of unemployment, by LLSI, immigrant, immigrant X LLSI, descendant, descendant X LLSI, and covariates.

	Austria	Belgium	Croatia
Constant	-0.050 (0.057)	0.193** (0.071)	0.405** (0.140)
LLSI	0.070*** (0.008)	0.065*** (0.012)	0.026 (0.018)
Immigrant	0.052*** (0.008)	0.064*** (0.010)	0.033 (0.021)
Immi. X LLSI	0.008 (0.018)	-0.013 (0.025)	-0.039 (0.048)
Descendant	0.024* (0.014)	0.079*** (0.016)	0.028 (0.026)
Desc. X LLSI	0.045 (0.032)	0.002 (0.041)	-0.037 (0.062)
Observations	6713	6108	4262
	Czech Republic	Estonia	France
Constant	-0.061 (0.061)	0.076 (0.095)	0.264*** (0.048)
LLSI	0.029** (0.009)	-0.013 (0.013)	0.032*** (0.007)
Immigrant	0.010 (0.018)	0.061*** (0.018)	0.060*** (0.009)
Immi. X LLSI	**0.086* (0.046)**	0.011 (0.032)	-0.013 (0.020)
Descendant	0.021 (0.015)	0.084*** (0.016)	0.028** (0.009)
Desc. X LLSI	0.007 (0.033)	-0.025 (0.032)	-0.006 (0.026)
Observations	7047	4544	11 913
	Germany	Hungary	Italy
Constant	0.091** (0.044)	-0.007 (0.052)	0.393*** (0.041)
LLSI	0.073*** (0.006)	-0.003 (0.007)	0.023*** (0.006)
Immigrant	0.029** (0.009)	0.036 (0.026)	0.029*** (0.007)
Immi. X LLSI	**-0.055** (0.024)**	-0.020 (0.069)	0.025 (0.022)
Descendant	0.001 (0.009)	0.009 (0.029)	-0.049** (0.021)
Desc. X LLSI	-0.014 (0.020)	-0.054 (0.062)	0.037 (0.065)
Observations	13 066	14 179	21 237
	Latvia	Lithuania	Luxembourg
Constant	0.124 (0.094)	0.188* (0.108)	0.076 (0.050)

LLSI	0.019 (0.014)	-0.018 (0.015)	0.017 (0.013)
Immigrant	0.027 (0.017)	0.043** (0.022)	0.036*** (0.006)
Immi. X LLSI	-0.012 (0.033)	-0.044 (0.053)	**0.073*** (0.017)**
Descendant	0.021 (0.014)	0.088** (0.031)	0.016* (0.009)
Desc. X LLSI	-0.045 (0.030)	-0.005 (0.098)	**0.061** (0.030)**
Observations	6811	4877	7329
	Netherlands	Norway	Slovenia
Constant	0.034 (0.040)	0.092 (0.058)	0.521*** (0.087)
LLSI	0.018*** (0.005)	0.009 (0.009)	0.066*** (0.012)
Immigrant	0.013 (0.008)	0.052*** (0.010)	0.009 (0.016)
Immi. X LLSI	-0.002 (0.020)	0.015 (0.028)	0.030 (0.031)
Descendant	0.053*** (0.011)	0.014 (0.015)	0.048** (0.019)
Desc. X LLSI	**-0.089*** (0.024)**	**0.108** (0.043)**	-0.059 (0.044)
Observations	6122	2736	5249
	Spain	Switzerland	United Kingdom
Constant	0.349*** (0.060)	0.063* (0.033)	0.036 (0.047)
LLSI	-0.004 (0.009)	0.013** (0.006)	0.007 (0.006)
Immigrant	0.092*** (0.010)	0.014** (0.004)	0.015* (0.008)
Immi. X LLSI	-0.031 (0.038)	**0.027** (0.010)**	0.020 (0.020)
Descendant	-0.048* (0.027)	0.004 (0.005)	-0.005 (0.011)
Desc. X LLSI	**0.180** (0.064)**	-0.004 (0.014)	-0.008 (0.027)
Observations	16 606	7293	6857

Significance level *** = 0.01 ** = 0.05 * = 0.1 NS/(empty) = > 0.1

Notes Included covariates: Two educational level dummies, gender dummy, marital status dummy, age and age squared.

Standard errors presented in parentheses. Full models available on request.

Statistically significant interaction terms in boldface.

Table 4. Results from OLS regression of unemployment, by LLSI and covariates, separately for the majority (1), immigrant (2) and descendant (3) samples.

	(1) Majority	(2) Immigrant	(3) Descendant
Austria	0.074*** (0.007)	0.073** (0.023)	0.119** (0.037)
Belgium	0.062*** (0.011)	0.068** (0.029)	0.081 (0.053)
Croatia	0.023 (0.018)	-0.008 (0.050)	-0.024 (0.065)
Czech Republic	0.030** (0.009)	0.105* (0.059)	0.011 (0.038)
Estonia	-0.016 (0.012)	0.002 (0.036)	-0.026 (0.038)
France	0.031*** (0.007)	0.021 (0.025)	0.025 (0.028)
Germany	0.072*** (0.006)	0.027 (0.028)	0.056** (0.021)
Hungary	-0.003 (0.007)	-0.054 (0.078)	-0.040 (0.063)
Italy	0.024*** (0.006)	0.038 (0.024)	0.050 (0.053)
Latvia	0.009 (0.013)	0.019 (0.032)	-0.044 (0.029)
Lithuania	-0.020 (0.015)	-0.054 (0.058)	-0.098 (0.120)
Luxembourg	0.029** (0.009)	0.091*** (0.014)	0.069** (0.028)
Netherlands	0.014** (0.005)	0.021 (0.025)	-0.081** (0.038)
Norway	0.016** (0.007)	0.046 (0.048)	0.131** (0.061)
Slovenia	0.063*** (0.012)	0.085** (0.033)	0.000 (0.049)
Spain	-0.001 (0.009)	-0.026 (0.044)	0.155** (0.065)
Switzerland	0.013** (0.004)	0.039** (0.012)	0.012 (0.012)
United Kingdom	0.006 (0.006)	0.032 (0.023)	0.005 (0.023)
Significance level	*** = 0.01 ** = 0.05 * = 0.1 NS/(empty) = > 0.1		
Notes	Included covariates: Two educational level dummies, gender dummy, marital status dummy, age and age squared.		
	Standard errors presented in parentheses.		
	Only LLSI coefficient shown. Full models available on request.		

Table 5. Results from OLS regression of unemployment, by LLSI, immigrant, immigrant X LLSI, descendant, descendant X LLSI, and covariates for (1) non-European minorities and (2) all minorities.

	France		Netherlands	
	(1) Non-EU	(2) All	(1) Non-EU	(2) All
Constant	0.260*** (0.047)	0.264*** (0.048)	0.037 (0.040)	0.034 (0.040)
LLSI	0.030*** (0.007)	0.032*** (0.007)	0.015*** (0.005)	0.018*** (0.005)
Immigrant	0.082*** (0.010)	0.060*** (0.009)	0.017* (0.009)	0.013 (0.008)
Immi. X LLSI	-0.020 (0.023)	-0.013 (0.020)	0.016 (0.023)	-0.002 (0.020)
Descendant	0.039*** (0.012)	0.028** (0.009)	0.036** (0.013)	0.053*** (0.011)
Desc. X LLSI	0.013 (0.036)	-0.006 (0.026)	**-0.069** (0.033)**	**-0.089*** (0.024)**
Observations	11 913		6122	
	Spain		The U.K.	
	(1) Non-EU	(2) All	(1) Non-EU	(2) All
Constant	0.346*** (0.060)	0.349*** (0.060)	0.037 (0.047)	0.036 (0.047)
LLSI	-0.002 (0.009)	-0.004 (0.009)	0.009 (0.006)	0.007 (0.006)
Immigrant	0.107*** (0.011)	0.092*** (0.010)	0.031*** (0.009)	0.015* (0.008)
Immi. X LLSI	**-0.093** (0.044)**	-0.031 (0.038)	0.022 (0.023)	0.020 (0.020)
Descendant	-0.039 (0.030)	-0.048* (0.027)	0.013 (0.016)	-0.005 (0.011)
Desc. X LLSI	**0.175** (0.070)**	**0.180** (0.064)**	-0.058 (0.042)	-0.008 (0.027)
Observations	16 606		6857	
Significance levels	*** = 0.01 ** = 0.05 * = 0.1 NS/(empty) = > 0.1			
Notes	Included covariates: Two educational level dummies, marital status dummy, gender dummy, age and age squared.			
	Standard errors in parentheses. Full models available on request.			
	Statistically significant interaction terms in boldface.			

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Appendix

Table A1. Number of observations in 31 European countries, by minority background.

Country	Majority	Immigrants	Descendants
A. Included countries (N=18)			
Austria	5592	1121	337
Belgium	5051	1057	342
Croatia	3740	522	316
Czech Republic	6817	230	333
Estonia	4038	506	579
France	10 700	1213	964
Germany	12 234	832	830
Hungary	14 029	150	136
Italy	19 358	1879	204
Latvia	5975	836	1070
Lithuania	4582	306	133
Luxembourg	3531	3798	714
Netherlands	5732	390	220
Norway	2490	246	107
Slovenia	4646	603	368
Spain	14 924	1682	218
Switzerland	5613	1680	905
United Kingdom	5975	882	377
B. Excluded countries (N=13)			
Bulgaria	7415	37	33
Cyprus	4132	1063	44
Denmark	2797	206	60
Finland	4821	182	15
Greece	6035	684	76
Iceland	1634	181	44
Ireland†	2723	782	117

Malta	4764	277	67
Poland	16 096	22	418
Portugal	5927	506	49
Romania	8048	11	13
Slovakia	7421	79	145
Sweden	2854	448	62

Notes Only participants who answered the health questions are included in the sample.

Individuals with missing information on health variables were dropped.

Countries with <100 observations in immigrant/ descendant samples excluded.

† Ireland excluded due to a very low number of descendants with LLSI (N=7).

Table A2. Descriptive statistics on higher education, age, married, and woman in 18 European countries, by minority background. Percent.

	Higher education			Age		
	Majority	Immigrant	Descendant	Majority	Immigrant	Descendant
Austria	23.09	20.07	22.26	44.20	42.51	44.13
Belgium	42.70	39.26	35.38	43.43	42.58	41.48
Croatia	15.19	11.49	18.04	47.19	47.61	44.44
Czech Republic	17.12	24.78	11.41	44.17	44.95	47.22
Estonia	32.89	33.79	30.40	43.61	49.34	44.14
France	33.73	30.75	37.24	43.85	45.87	41.18
Germany	38.02	39.18	35.78	45.30	43.77	46.60
Hungary	21.28	31.33	31.62	44.41	43.23	47.51
Italy	17.67	15.27	27.45	44.11	41.25	41.09
Latvia	28.05	23.33	24.02	43.38	50.19	44.12
Lithuania	31.21	30.07	36.84	46.27	51.07	46.11
Luxembourg	23.93	31.78	22.97	44.20	42.14	41.21
Netherlands	40.40	38.72	42.73	44.47	42.84	42.72
Norway	45.06	45.12	40.19	44.08	41.02	44.11
Slovenia	27.83	13.10	25.82	42.42	46.03	40.10
Spain	32.64	24.61	28.44	43.97	40.53	42.91
Switzerland	29.81	41.67	29.94	44.78	43.61	43.54
United Kingdom	39.50	50.45	53.32	44.21	41.06	43.19
	Married			Woman		
	Majority	Immigrant	Descendant	Majority	Immigrant	Descendant
Austria	57.10	69.49	53.12	51.68	55.84	52.52
Belgium	55.20	66.23	50.88	51.16	53.07	53.51
Croatia	71.84	78.93	71.52	56.76	62.64	57.59
Czech Republic	62.56	61.74	67.27	57.72	52.61	57.66
Estonia	51.11	67.98	54.23	56.76	60.47	55.96
France	55.03	70.98	55.29	51.34	54.91	50.21
Germany	62.24	71.39	62.77	52.77	57.09	52.05

Hungary	58.66	67.33	64.71	53.09	54.00	55.88
Italy	63.58	67.48	50.49	50.66	59.29	49.51
Latvia	48.72	61.36	47.94	53.66	57.89	50.65
Lithuania	73.33	74.84	58.65	56.26	55.23	60.15
Luxembourg	61.68	72.35	54.06	50.61	52.74	49.72
Netherlands	57.21	54.87	39.09	53.19	57.69	57.73
Norway	52.29	65.85	47.66	45.98	50.41	38.32
Slovenia	54.95	66.50	48.37	52.17	52.74	51.09
Spain	64.41	68.31	57.80	51.14	54.64	53.67
Switzerland	62.66	68.39	60.77	53.59	54.76	55.80
United Kingdom	58.64	67.01	58.89	55.26	55.67	56.50

Notes EU-SILC cross sectional data material 2011.

Number of observations split by minority background in table A1.

Table A3. Results from OLS regression of unemployment, by LLSI, immigrant, immigrant X LLSI, descendant, descendant X LLSI, and covariates - separately for men (1) and women (2).

	Austria		Belgium		Croatia	
	(1) Men	(2) Women	(1) Men	(2) Women	(1) Men	(2) Women
Constant	0.014	-0.141*	0.097	0.289**	0.755***	0.129
	(0.086)	(0.075)	(0.100)	(0.099)	(0.207)	(0.187)
LLSI	0.086***	0.054***	0.065***	0.065***	0.009	0.046*
	(0.012)	(0.011)	(0.017)	(0.016)	(0.026)	(0.025)
Immigrant	0.062***	0.042***	0.097***	0.034**	0.013	0.045*
	(0.012)	(0.011)	(0.014)	(0.014)	(0.033)	(0.026)
Immi. X LLSI	0.019	0.015	0.008	-0.032	-0.001	-0.066
	(0.030)	(0.023)	(0.036)	(0.035)	(0.069)	(0.068)
Descendant	0.040**	0.011	0.079**	0.078**	0.053	0.011
	(0.020)	(0.018)	(0.023)	(0.023)	(0.039)	(0.034)
Desc. X LLSI	0.029	0.061	-0.111	0.068	-0.095	0.003
	(0.051)	(0.040)	(0.065)	(0.053)	(0.089)	(0.086)
Observations	3197	3516	2963	3145	1812	2450
	Czech Republic		Estonia		France	
	(1) Men	(2) Women	(1) Men	(2) Women	(1) Men	(2) Women
Constant	0.134	-0.200**	-0.004	0.072	0.260***	0.273***
	(0.089)	(0.082)	(0.160)	(0.113)	(0.067)	(0.067)
LLSI	0.032**	0.027**	-0.065**	0.026	0.036**	0.028**
	(0.014)	(0.012)	(0.022)	(0.016)	(0.010)	(0.010)
Immigrant	0.003	0.017	0.054*	0.066**	0.076***	0.044***
	(0.025)	(0.025)	(0.031)	(0.020)	(0.012)	(0.012)
Immi. X LLSI	0.073	0.100	0.046	-0.011	-0.034	0.005
	(0.067)	(0.062)	(0.058)	(0.037)	(0.032)	(0.026)
Descendant	0.040*	0.007	0.095***	0.073***	0.035**	0.021
	(0.022)	(0.021)	(0.027)	(0.019)	(0.013)	(0.013)
Desc. X LLSI	-0.005	0.016	0.036	-0.075**	0.043	-0.042
	(0.052)	(0.044)	(0.053)	(0.038)	(0.039)	(0.035)
Observations	2991	4056	1946	2598	5754	6159
	Germany		Hungary		Italy	
	(1) Men	(2) Women	(1) Men	(2) Women	(1) Men	(2) Women
Constant	0.066	0.100*	0.085	-0.126*	0.529***	0.255***
	(0.064)	(0.060)	(0.078)	(0.069)	(0.061)	(0.056)

LLSI	0.078***	0.069***	-0.012	0.005	0.037***	0.012
	(0.009)	(0.008)	(0.011)	(0.009)	(0.010)	(0.009)
Immigrant	0.028**	0.028**	0.044	0.032	0.031**	0.027**
	(0.014)	(0.012)	(0.040)	(0.034)	(0.012)	(0.009)
Immi. X LLSI	-0.000	-0.086**	-0.137	0.043	-0.022	**0.058****
	(0.038)	(0.031)	(0.116)	(0.085)	(0.035)	**(0.028)**
Descendant	-0.007	0.007	0.014	0.003	-0.067**	-0.031
	(0.013)	(0.013)	(0.046)	(0.036)	(0.030)	(0.030)
Desc. X LLSI	-0.010	-0.016	-0.033	-0.079	**0.203***	-0.060
	(0.030)	(0.028)	(0.094)	(0.081)	**(0.108)**	(0.081)
Observations	6135	6931	6650	7529	10 316	10 921

	Latvia		Lithuania		Luxembourg	
	(1) Men	(2) Women	(1) Men	(2) Women	(1) Men	(2) Women
Constant	-0.053	0.201*	-0.110	0.379**	0.016	0.135*
	(0.148)	(0.119)	(0.168)	(0.140)	(0.071)	(0.070)
LLSI	0.024	0.013	-0.012	-0.025	0.046**	-0.012
	(0.022)	(0.018)	(0.024)	(0.019)	(0.018)	(0.018)
Immigrant	0.065**	0.000	0.027	0.055*	0.046***	0.024**
	(0.027)	(0.021)	(0.034)	(0.028)	(0.008)	(0.008)
Immi. X LLSI	**-0.118****	0.052	-0.065	-0.035	0.038	**0.110*****
	(0.059)	(0.038)	(0.088)	(0.066)	(0.025)	**(0.024)**
Descendant	0.043*	0.002	0.130**	0.055	0.017	0.015
	(0.022)	(0.019)	(0.050)	(0.039)	(0.012)	(0.013)
Desc. X LLSI	-0.042	-0.040	-0.289	0.105	0.027	**0.090****
	(0.048)	(0.038)	(0.208)	(0.110)	(0.051)	**(0.039)**
Observations	3121	3690	2136	2741	3539	3790

	Netherlands		Norway		Slovenia	
	(1) Men	(2) Women	(1) Men	(2) Women	(1) Men	(2) Women
Constant	0.008	0.051	0.118	0.054	0.570***	0.497***
	(0.059)	(0.053)	(0.089)	(0.069)	(0.121)	(0.125)
LLSI	0.024**	0.014**	0.003	0.015	0.056**	0.075***
	(0.009)	(0.007)	(0.014)	(0.010)	(0.018)	(0.017)
Immigrant	0.013	0.013	0.060***	0.045***	-0.006	0.020
	(0.012)	(0.011)	(0.016)	(0.013)	(0.022)	(0.023)
Immi. X LLSI	-0.056	0.016	**0.201*****	**-0.069****	0.043	0.014
	(0.039)	(0.023)	**(0.054)**	**(0.029)**	(0.044)	(0.044)
Descendant	0.088***	0.025*	0.026	-0.008	0.052**	0.046*
	(0.016)	(0.014)	(0.021)	(0.020)	(0.025)	(0.028)

Desc. X LLSI	**-0.134****	**-0.055***	**0.186****	-0.012	0.027	**-0.094***
	(0.039)	**(0.030)**	**(0.061)**	(0.057)	(0.073)	**(0.056)**
Observations	2848	3274	1467	1269	2507	2742

	Spain		Switzerland		United Kingdom	
	(1) Men	(2) Women	(1) Men	(2) Women	(1) Men	(2) Women
Constant	0.309***	0.374***	0.053	0.063	-0.042	0.071
	(0.087)	(0.082)	(0.054)	(0.041)	(0.079)	(0.056)
LLSI	-0.040**	0.025**	0.028**	0.002	0.007	0.008
	(0.014)	(0.013)	(0.010)	(0.006)	(0.012)	(0.008)
Immigrant	0.164***	0.031**	0.015**	0.012**	0.007	0.022**
	(0.015)	(0.013)	(0.007)	(0.005)	(0.013)	(0.009)
Immi. X LLSI	-0.081	0.009	**0.060****	0.003	0.053	-0.004
	(0.062)	(0.047)	**(0.018)**	(0.012)	(0.035)	(0.024)
Descendant	-0.076*	-0.025	0.005	0.002	-0.011	0.000
	(0.041)	(0.036)	(0.008)	(0.006)	(0.019)	(0.013)
Desc. X LLSI	**0.158***	**0.195****	0.021	-0.017	-0.007	-0.010
	(0.095)	**(0.086)**	(0.025)	(0.016)	(0.046)	(0.032)
Observations	8055	8551	3365	3928	3064	3793

Significance level *** = 0.01 ** = 0.05 * = 0.1 NS/(empty) = > 0.1

Notes Included covariates: Two educational level dummies, marital status dummy, age and age squared.

Standard errors presented in parentheses. Full models available on request.

Statistically significant interaction terms in boldface.

Table A4. Sensitivity testing. OLS regression of unemployment, by bad/fair health, immigrant, immigrant X bad/fair health, descendant, descendant X bad/fair health, and covariates (panel A), or OLS regression of unemployment, by LLSI, immigrant, immigrant X LLSI, descendant, descendant X LLSI, and covariates (panel B).

	A. Change of health measure		B. Change of unemployment measure	
	Immigrant X bad/fair health	Descendant X bad/fair health	Immigrant X LLSI	Descendant X LLSI
Austria	0.015 (0.016)	0.062** (0.029)	-0.044** (0.015)	0.034 (0.026)
Belgium	-0.026 (0.022)	-0.026 (0.036)	-0.002 (0.020)	-0.049 (0.033)
Croatia	-0.029 (0.038)	0.061 (0.049)	0.029 (0.039)	0.037 (0.050)
Czech Republic	0.034 (0.036)	-0.016 (0.028)	0.067 (0.043)	0.017 (0.031)
Estonia	0.013 (0.030)	0.033 (0.028)	0.004 (0.032)	-0.043 (0.031)
France	-0.010 (0.017)	-0.016 (0.020)	-0.025 (0.018)	-0.008 (0.022)
Germany	-0.049** (0.018)	-0.003 (0.018)	-0.036* (0.022)	0.022 (0.018)
Hungary	0.028 (0.052)	-0.064 (0.052)	0.010 (0.065)	-0.058 (0.058)
Italy	0.023 (0.017)	0.035 (0.049)	0.034* (0.020)	0.057 (0.061)
Latvia	-0.024 (0.029)	0.000 (0.025)	-0.051 (0.031)	-0.054* (0.029)
Lithuania	-0.025 (0.041)	-0.072 (0.059)	-0.085* (0.051)	0.114 (0.094)
Luxembourg	0.018 (0.012)	0.062** (0.020)	0.027* (0.016)	0.048* (0.029)
Netherlands	0.027 (0.018)	-0.058** (0.024)	-0.011 (0.016)	-0.039** (0.019)
Norway	0.037* (0.022)	0.036 (0.030)	0.034 (0.022)	0.063* (0.034)
Slovenia	0.012 (0.028)	-0.034 (0.039)	-0.001 (0.024)	-0.042 (0.033)
Spain	-0.030 (0.027)	0.170** (0.059)	-0.046 (0.035)	0.075 (0.059)
Switzerland	0.013 (0.010)	-0.019 (0.013)	0.026** (0.011)	-0.006 (0.015)
United Kingdom	0.018 (0.019)	-0.032 (0.028)	0.022 (0.020)	0.006 (0.027)

Significance level *** = 0.01 ** = 0.05 * = 0.1 NS/(empty) = > 0.1

Notes Included covariates: Two educational level dummies, gender dummy, marital status dummy, age and age squared.

Standard errors presented in parentheses.

Only interaction terms (immigrant/ descendant X ill health) shown. Full models available on request.

Table A5. Results from logistic regression of unemployment, by LLSI, immigrant, immigrant X LLSI, descendant, descendant X LLSI, and covariates.

	Austria	Belgium	Croatia
Constant	0.006*** (0.007)	0.369 (0.351)	0.602 (0.509)
LLSI	3.643*** (0.540)	2.321*** (0.333)	1.184 (0.134)
Immigrant	3.212*** (0.510)	2.429*** (0.313)	1.222 (0.154)
Immi. X LLSI	**0.575** (0.152)**	0.642 (0.173)	0.795 (0.235)
Descendant	1.999** (0.569)	2.609*** (0.486)	1.178 (0.186)
Desc. X LLSI	0.875 (0.404)	0.672 (0.269)	0.800 (0.303)
Observations	6713	6108	4262
	Czech Republic	Estonia	France
Constant	0.007*** (0.008)	0.065** (0.065)	1.112 (0.775)
LLSI	1.523** (0.202)	0.882 (0.129)	1.612*** (0.168)
Immigrant	1.221 (0.362)	1.876*** (0.322)	2.333*** (0.268)
Immi. X LLSI	1.624 (0.849)	1.072 (0.333)	0.714 (0.175)
Descendant	1.386 (0.326)	2.182*** (0.321)	1.548** (0.207)
Desc. X LLSI	0.902 (0.392)	0.784 (0.233)	0.807 (0.267)
Observations	7047	4544	11 913
	Germany	Hungary	Italy
Constant	0.133** (0.103)	0.021*** (0.012)	1.240 (0.586)
LLSI	2.630*** (0.234)	0.981 (0.075)	1.335*** (0.102)
Immigrant	1.917*** (0.302)	1.534 (0.436)	1.373*** (0.112)
Immi. X LLSI	**0.441** (0.157)**	0.722 (0.591)	1.120 (0.265)
Descendant	1.012 (0.204)	1.086 (0.390)	0.464** (0.161)
Desc. X LLSI	0.868 (0.274)	0.351 (0.384)	1.827 (1.524)
Observations	13 066	14 179	21 237

	Latvia	Lithuania	Luxembourg
Constant	0.112** (0.075)	0.216 (0.204)	0.043** (0.052)
LLSI	1.133 (0.108)	0.866 (0.117)	2.190** (0.769)
Immigrant	1.226* (0.144)	1.431** (0.259)	3.284*** (0.590)
Immi. X LLSI	0.919 (0.206)	0.689 (0.338)	1.374 (0.531)
Descendant	1.167 (0.117)	1.930** (0.455)	2.083** (0.542)
Desc. X LLSI	0.742 (0.157)	0.923 (0.664)	1.604 (0.927)
Observations	6811	4877	7329
	Netherlands	Norway	Slovenia
Constant	0.037 (0.074)	0.057 (0.157)	5.040* (4.231)
LLSI	2.179** (0.492)	1.977* (0.806)	1.856*** (0.215)
Immigrant	1.915* (0.692)	5.164*** (1.856)	1.144 (0.191)
Immi. X LLSI	0.685 (0.492)	0.780 (0.630)	1.132 (0.310)
Descendant	4.714*** (1.544)	1.847 (1.191)	1.608** (0.284)
Desc. X LLSI	-	2.422 (2.738)	0.566 (0.220)
Observations	6077	2736	5249
	Spain	Switzerland	United Kingdom
Constant	0.561 (0.244)	0.225 (0.411)	0.037** (0.046)
LLSI	0.976 (0.072)	2.268** (0.682)	1.199 (0.204)
Immigrant	1.827*** (0.120)	2.414*** (0.571)	1.559** (0.313)
Immi. X LLSI	0.833 (0.219)	1.114 (0.471)	1.303 (0.559)
Descendant	0.660* (0.160)	1.360 (0.465)	0.836 (0.310)
Desc. X LLSI	**3.345** (1.448)**	0.776 (0.563)	0.804 (0.665)
Observations	16 606	7293	6857

Significance level *** = 0.01 ** = 0.05 * = 0.1 NS/(empty) = > 0.1

Notes

Included covariates: Two educational level dummies, gender dummy, marital status dummy, age and age squared.

Odds ratios (standard errors in parentheses) presented. Full models available on request.

Statistically significant interaction terms in boldface.

The reason that there is no coefficient for the Netherlands in table A4 is simply because *none* of the descendants with ill health reports to be unemployed.

Table A6. Number of observations in 31 European countries, by minority background (split by European and non-European).

Country	Majority	EU immigrants	Non-EU immigrants	EU descendants	Non-EU descendants
A. Included countries (N=18)					
Austria	5592	413	708	337	0
Belgium	5051	465	592	269	73‡
Croatia	3740	57	465	306	10
Czech Republic	6817	176	54	332	1
Estonia	4038	0	506	579	0
France†	10 700	373	840	464	500
Germany	12 234	0	832	830	0
Hungary	14 029	108	42	130	6
Italy	19 358	608	1271	133	71‡
Latvia	5975	0	836	1070	0
Lithuania	4582	28	278	130	3
Luxembourg	3531	3066	732	680	34
Netherlands†	5732	100	290	85	135
Norway	2490	118	128	42	65
Slovenia	4646	0	603	368	0
Spain†	14 924	471	1211	37	181
Switzerland	5613	1033	647	831	74‡
United Kingdom†	5975	252	630	207	170
B. Excluded countries (N=13)					
Bulgaria	7415	7	30	33	0
Cyprus	4132	427	636	25	19
Denmark	2797	80	126	36	24
Finland	4821	83	99	3	12
Greece	6035	141	543	54	22
Iceland	1634	101	80	40	4
Ireland	2723	546	236	70	47
Malta	4764	0	277	67	0

Poland	16 096	4	18	403	15
Portugal	5927	125	381	49	0
Romania	8048	1	10	9	4
Slovakia	7421	69	10	143	2
Sweden	2854	159	289	49	13

Notes Only participants who answered the health questions are included in the sample.

Individuals with missing information on health variables were dropped.

† = Number of non-European immigrants and non-European descendants are >100

‡ = Number of non-European descendants with LLSI is low in Belgium, Italy and Switzerland (9, 6 and 7, respectively).