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Why do immigrants become less happy? Explanations for the decrease in life satisfaction of immigrants in Germany over time

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Abstract

We investigate the life satisfaction (LS) trajectories of immigrants in Germany. Using data from the German Socio-Economic Panel from 1984 to 2015, we find that recently arrived immigrants are more satisfied with their lives than comparable German natives. However, their LS decreases more over time than that of their German counterparts; that is, we observe a negative years-since-migration (YSM)–LS association. We propose and test five possible explanations for this observation: (1) differential effects of declining health between natives and immigrants, (2) the stability of the YSM–LS association over time and across samples, (3) the effects of non-random sample attrition, (4) immigrants' integration in German society, and (5) differences in the YSM effect across ethnic backgrounds. We find that the decrease in LS among immigrants over time is mostly explained by a combination of deteriorating health and an increase in the importance of health for LS. The extent to which immigrants' LS changes over time in the host country partly depends on their country of origin. The results suggest that there is scope for policies targeted towards immigrants' better utilisation of the health-care system and their integration in host societies to improve immigrants' LS.

Keywords: Europe, Germany, immigrants, life satisfaction, subjective well-being

1. Introduction

Immigration and the integration of immigrants have been long-standing matters of policy concerns in almost all developed countries. Germany received over a million refugees

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over the course of 2015 (OECD 2017) against a background of wide skepticism about its ability to integrate such an inflow of immigrants. How immigrants perceive (and how satisfied they are with) their new lives in their host country is likely to be an indicator of the success or failure of this effort. Researchers have repeatedly drawn attention to the value of routinely measuring subjective well-being to identify policy targets and measure the success of policies (e.g. Dolan and White 2007; Hicks et al. 2013; Frijters et al. 2020). A recent proposal to make well-being a central goal of governments and how to put such a goal into practice posits that life satisfaction (LS)—which is also the focus of our empirical analysis—is a good measure of well-being that can be employed to inform policy (Frijters et al. 2020). An evaluative subjective well-being measure, such as LS, is based on how respondents think of important aspects of their lives (e.g. Diener et al. 2009a). Some researchers posit that respondents compare their actual circumstances to their expectations and evaluate how well these two match (e.g. Shin and Johnson 1978; Michalos 1985); in other words, their LS depends on the gap between their aspirations and attainments (Plagnol and Easterlin 2008). In the case of migration, LS measures may, among other things, reflect how well immigrants' expectations and hopes for their lives in the host country match their actual experiences.

Immigrants' LS should be a central concern of policymakers and it can be seen as one way to assess successful integration in the host society—thus complementing the objective conditions of immigrants' integration which have often been the focus of past research. For example, the LS of immigrants from non-EU countries has been found to be negatively associated with restrictive integration policies in a sample of countries that were included in the European Social Survey (ESS) (Heizmann and Böhnke 2019).

The present study contributes to the literature on migration and LS by investigating the LS trajectories of immigrants after they arrive in the host country, and by testing a number of heretofore rarely considered explanations for the observed patterns. The analysis thus contributes to our understanding of the long-term outcomes of international migration and may allow policymakers to better consider the needs of newly settled immigrants. We hereby focus on Germany—a country with high levels of immigration. While recent waves of immigrants to Germany consisted largely of refugees fleeing wars (OECD 2017), past immigration to Germany has been characterised by a variety of motivations to immigrate, including economic migration, migration by (descendants of) ethnic Germans, war refugees from the Balkans in the 1990s, and political refugees (Münz and Ulrich 1998). However, most immigrants have shared characteristics, such as arriving in Germany with comparatively fewer skills, a poor or imperfect command of the German language, and the experience of having to adjust to a different and at times hostile environment.

Neoclassical microeconomic theory of migration assumes that migrants carefully weigh the costs and benefits of migration and only leave their home countries if the potential benefits exceed the costs, thus maximising their long-term utility (De Jong et al. 1983). An analysis of immigrants' LS allows an investigation of experienced, that is, actual utility. Many early studies on the outcomes of migration focused on economic integration (Harris and Todaro 1970), and indeed migrants often experience an increase in household incomes (Nikolova and Graham 2015). However, life in the host country is often different to what migrants expected. Employment might not materialise easily and its lack may thus bring psychological hardship (Clark 2003; Leopold et al. 2017). In addition,

immigrants are often employed in low-skill jobs that may be dangerous to health and may lead to declining satisfaction with health in addition to reduced job satisfaction. Lack of family support and social embeddedness, integration problems, difficult housing situations, and possible discrimination may further decrease LS. Although the aim of migration is usually to improve the quality of life of the migrant and their family, there can thus be unintended consequences. For instance, an analysis of the LS of immigrants in the UK showed that these migrants appeared to change their income comparison groups after migration; that is, their relative income compared with others in the host country mattered more for LS than how their income compared with those in their country of origin (Shen and Kogan 2020).

To date, the evolution of immigrants' LS once they have arrived in the host country has been rarely investigated as many studies simply compare the subjective well-being of migrants to that of stayers in the home country or natives in the host country. In contrast, the present study analyses the LS patterns of immigrants after they arrive in Germany. In particular, we explore how the number of years since migration (YSM) is associated with the LS of immigrants, and how this relationship is shaped by a number of factors such as health, social integration, or ethnic background. We find that recently arrived immigrants are more satisfied with their lives than comparable German natives. However, their LS decreases more over time than that of their German counterparts.

We propose and test five possible explanations that could explain the negative YSM effect on LS in Germany that have so far been underexplored in the literature, namely: (1) differential effects of declining health between natives and immigrants, (2) the stability of the YSM–LS association over time, (3) the effects of non-random sample attrition, (4) immigrants' integration in German society, and (5) differences in the YSM effect across ethnicities.

The existing literature on YSM effects in Germany finds consistent negative effects on LS but fails to consider many of the mechanisms we analyse. Using a subset of our data to analyse the incomes and LS of immigrants in Germany, Obućina (2013) finds that immigrants who have been longer in the host country report lower levels of LS. However, our study differs from his in a number of important ways: we offer a more thorough analysis of the role played by health in explaining this phenomenon. Decreasing levels in LS might be due to deteriorating immigrant health, or to different relative weights that immigrants and natives apply to health when they evaluate their LS. We also investigate the role of and account for attrition in our analysis—an important factor given potential return migration decisions of immigrants.

The remainder of this article is structured as follows. Section 2 embeds our article within the literature. Section 3 describes the data, measures, and our analytical strategy. Results follow in Section 4. Section 5 briefly discusses the findings and concludes.

2. Literature

2.1 LS and migration

A nascent literature increasingly incorporates subjective well-being measures—such as happiness and LS—to assess reasons for migration and its consequences for migrants and

natives in the destination country (e.g. [Bartram 2011, 2013](#); [Hendriks 2015](#); [Stillman et al. 2015](#); [Hendriks and Bartram 2016](#)).

In the following review of the literature, we will focus on LS which is also the focus of our empirical analysis. As we will discuss in detail below, these studies often find that immigrants report lower LS than natives in the host country, and some of these well-being differences can be explained by differences in socio-economic factors, such as income. A recent systematic review of 30 studies by [Paloma et al. \(2021\)](#) identified 12 main determinants of economic migrants' LS which they grouped into three broader categories, namely structural integration, social and cultural inclusion, and individual strengths.

Immigrants in Canada generally reported higher LS than stayers in their home countries, especially when they migrated from countries with lower GDP levels ([Frank et al. 2016](#)). The same study found that most immigrant groups reported similar levels of LS as respondents who were born in Canada once socio-economic and other characteristics were included in the analysis. However, people select into migration and it is therefore plausible that LS is one of the determinants of the decision to migrate; that is, those who decide to leave their home country may already differ significantly from stayers with respect to LS even before they migrate. Indeed, a recent study using data from 35 European and Central Asian countries found that respondents who reported either the highest or lowest levels of LS were the most likely to express intentions to emigrate ([Ivlevs 2015](#)). A small study of migrants from Russia to Finland which measured their LS before and after migration observed an initial increase in LS post-migration ([Lönnqvist et al. 2015](#)). Self-selection with regards to characteristics that are strongly associated with LS, such as education and employment status, has also been found to be a factor for internal economic migration in Germany ([Kratz 2020](#)).

Findings on the LS outcomes of migration often differ by host countries; possibly because of differences in the attitudes of the native-born population towards immigrants ([Kogan et al. 2018](#)), or differences in migrants' satisfaction with the host country's economy ([Kogan and Shen 2019](#)). [Bartram \(2011\)](#) found a negative association between LS and being an immigrant in the USA in a cross-section of the World Values Survey. [Safi \(2010\)](#) provides the most comprehensive international evidence on this negative association: using data from the ESS, immigrants reported lower levels of LS in all of the 13 European countries included in the study, with LS being lowest among immigrants who arrived in the host country 5–10 years ago. Contrary to our findings, time since migration did not have a significant effect on immigrants' LS in Canada ([Monteiro and Haan 2021](#)), but the same study found income to be a predictor of their LS. Focusing on LS and life evaluation in a pooled sample of European and Anglo-Saxon countries that were included in the Gallup World Poll, [Olgjati et al. \(2013\)](#) found that higher incomes are associated with higher well-being outcomes for immigrants in only a few countries, suggesting that other factors are important determinants of migrants' LS.

[Erlichhagen \(2011\)](#) examined the LS and happiness of German emigrants, non-emigrants and remigrants (i.e. return migrants) using ESS data and found that emigrants reported higher levels of these subjective well-being indicators compared with non-emigrants and remigrants; suggesting that emigration is either selective and/or indeed beneficial for LS. In another study, intended return migration was found to partly depend on migrant's ability to maximise their LS in the host country compared with their home

country (Schiele 2021). A study of Turkish migrants and return migrants found that they reported higher levels of LS in old age than Turkish non-migrants, suggesting benefits of migration which, however, could not be attributed to income differences (Baykara-Krumme and Platt 2018).

Another recent study implies that immigrants form important ties after migration, which is reflected in the observation that the LS of first-generation immigrants is associated with both the average LS in their country of origin and the host country. However, average levels of LS in the origin country appear to be of less importance for first-generation immigrants and of no importance for second-generation immigrants compared with average LS in the country of residence (Berggren et al. 2020).

Our data do not include pre-migration LS and we do therefore not know if migrants experienced a temporary boost in LS shortly after arrival. However, we can explore the post-migration trajectory of their LS and compare their reported well-being to that of German natives. Other studies have found that immigrants generally report lower LS than natives (Verkuyten 2008; Safi 2010).

2.2 Immigrants in Germany

Germany has one of the highest shares of immigrants in the European Union and therefore provides a good example for a careful investigation of post-migration subjective well-being trajectories. The history of immigration to Germany after WWII is well-documented (Elkeles and Seifert 1996; Münz and Ulrich 1998; OECD 2019).

The present study builds on previous research on migration to Germany and extends possible explanations for the negative YSM effect on LS. West Germany has a high share of immigrants compared with other European countries and most immigrants live in households in which all members of the household are of the same ethnic origin (Büchel and Frick 2005). Living in such 'non-mixed' households may have adverse effects on social integration as ethnic concentration may increase the transaction costs of communicating with natives (Danzer and Yaman 2013). However, living in a neighbourhood with a larger concentration of a migrant's own ethnic group has been found to be positively associated with LS for some ethnic groups in the UK (Knies et al. 2016).

Using data from the SOEP, Kóczán (2016) found that differences in LS between German natives and immigrants in Germany can be mostly attributed to economic factors, such as their employment status, rather than social integration. Kóczán's (2016) study further implies that immigrants in Germany are affected by economic shocks, such as unemployment, in a similar way to natives.

Obučina (2013) used panel data from Germany from 1994 to 2009 to analyse the dynamic aspects of immigration and LS as well as income satisfaction. In a Mundlak-type random effects model, he found that recently arrived immigrants reported higher levels of satisfaction than German natives, but their level of satisfaction dropped linearly with time and ended up well below the level of their German peers.¹ He offered a plausible explanation that an immigrant who arrived in Germany many years ago will feel dissatisfied if their income is the same as an otherwise equal but recently arrived immigrant. While the data and methodology are suited to assess dynamic aspects of LS, many possible explanations for the YSM effect have remained unexplored. The present paper fills this gap.

2.3 Potential explanations for the YSM effect on LS

The length of the stay in the host country may affect LS for a number of reasons. For instance, it is an important factor for language proficiency, which may improve employment opportunities. A poor command of the majority language in the host country has been found to be negatively associated with the LS of ethnic minority members (Beier and Kroneberg 2013). While recently arrived immigrants clearly perform worse in economic terms compared with natives, they usually improve their economic position over time (Büchel and Frick 2005). These positive changes would suggest an upwards sloping LS trajectory for immigrants, but the SOEP data show the opposite.

Immigrants partly select on health, that is, those who emigrate from their home countries are more likely to be healthy and, thus, they are also likely to have better health than natives (Farré 2016). This so-called ‘healthy immigrant’ effect has also been observed in Germany; however, immigrants’ health status decreases over time especially for those in physically demanding jobs (Giuntella and Mazzonna 2015). Therefore, health deterioration can be an explanatory factor of the YSM effect.

Assessments of health significantly predict levels of LS and happiness and may be partly determined by an immigrant’s cultural background (Ljunge 2016). Previous studies investigating the health satisfaction of migrants compared with German natives have found that migrants are generally not less satisfied with their health. However, differences between migrants and Germans were observed if they were unemployed (Elkeles and Seifert 1996). In this article, we consider the possibility that the importance of health in evaluating LS might be different between immigrants and natives. The cultural differences in the host country and lack of family and friendship ties may further lead to mental health problems as social support networks can buffer the negative mental health effects of ‘acculturative stress’ (Rogers-Sirin et al. 2014).

Another candidate explanation for the YSM effect is non-random attrition as more successful (and thus probably more satisfied) immigrants may decide to return to their home countries once they have met their objectives, leaving behind immigrants who fall short of their targets and are therefore less satisfied. We investigate the potential effects of attrition, and also the stability of the YSM effect in our empirical analysis; these two topics have heretofore, to our knowledge, not been explored in the literature.

We further consider how well-integrated immigrants are in German society and in which country they see their future. Some of the LS gaps between first-generation immigrants and natives in a set of European countries could be explained by differences in social embeddedness (Arpino and de Valk 2018) and social capital (Tegegne and Glanville 2019; this study uses a composite measure of LS and happiness). A recent study based on a Dutch sample showed that differences in LS between natives and immigrants could be explained by financial problems and stronger feelings of social isolation (de Vroome and Hooghe 2014), pointing to the importance of integration in the host country. Another study employing SOEP data has shown that cultural assimilation is positively associated with LS; however, this effect is only significant for established immigrants, not for recent arrivals (Angelini et al. 2015). We will consider all of the above explanations in our empirical analysis. In particular, we will test the role of the following factors in explaining the negative YSM–LS association in Germany: (1) health, (2) the stability of this association

over time, (3) non-random sample attrition, (4) integration in German society, and (5) differences in the YSM effect across ethnicities.

2.4 Framework

We follow [Dolan et al. \(2008\)](#) in categorising the factors which are commonly found to be associated with LS: Personal characteristics are factors which determine who we are and are by and large out of a person's control, such as age, ethnicity, biological sex, and their genetical makeup; socially developed characteristics are often observable characteristics which are acquired, and which may or may not reflect one's choices and preferences such as education, health, and occupation; time use refers to what we spend our time on; attitudes and beliefs include political persuasion and religiosity; relationships include whether one has a partner, family, and friends; the wider socio-economic context refers to the general economic and political situation that one is exposed to, such as inflation, general unemployment, and political freedom.

We operationalise this general model of LS by using a rich longitudinal dataset and selecting variables which capture most of the above domains. An individual fixed effect captures personal characteristics, and attitudes and beliefs to the extent that these do not change over time. We include household income, employment status, health status, and years of education as part of the socially developed characteristics, and variables on marital and parental status as part of an individual's relationships. Survey year effects control for the wider socio-economic context—assuming that they affect everybody in the sample equally.

3. Methods

3.1 Data

We use data from the German Socio-Economic Panel (SOEP) from 1984 to 2015 ([SOEP 2016](#)). The SOEP is a widely used dataset in LS research as it is one of the longest-running longitudinal panels that include satisfaction measures in addition to a wide range of individual and household-level characteristics (for an introduction to the dataset, see [Goebel et al. 2019](#)). It is a nationally representative panel study for which data are collected annually from approximately 15,000 households across Germany, including all household members who are eligible for the survey. For general information on the dataset, we refer the reader to [Wagner et al. \(2007\)](#).² The SOEP contains a number of different immigrant samples reflecting the changing nature of immigration to Germany over time. The survey institute oversamples immigrant households to allow a nuanced study of immigrant populations, which makes this dataset uniquely suited for the investigation of our research question. The inception sample of the SOEP oversampled households who in 1984 constituted the main groups of foreigners in the Federal Republic of Germany (referred to as sample B) by a factor of 10 compared with non-foreigner households (sample A).³ These main groups included households with a Turkish, Greek, Yugoslavian, Spanish, or Italian household head. Note that the nationality of the household head determines the sample categorisation of the household. A person born in Germany might thus fall into an

'immigrant' sample as defined by the SOEP if they lived with an immigrant, and vice versa. This differs from our immigrant definition as being born outside of Germany (further explained below). A second immigrant sample (sample D) was added in the survey years 1994/1995, including households in which at least one household member had moved from abroad after 1984. This sample consisted mostly of immigrants from the former Soviet Union and other Eastern European countries. More recently, immigrant sample M1, which was added in 2013, included immigrants who arrived in Germany after 1995 and second-generation immigrants. Immigrant sample M2, the most recent immigrant sample in our data, was added in 2015. Immigrants were also added to the SOEP within a number of different refresher samples.

Not all individuals in the immigrant samples of the SOEP are immigrants in the strict sense of the word. Some were born in Germany to (an) immigrant parent(s), others might be natives living with an immigrant partner who was identified to be the head of the household. We classify a respondent as an immigrant only if they have themselves moved to Germany from abroad. As is typical for long-running panels, the SOEP has added other refresher samples over the years. We include all available subsamples, except for the East German sample, which was added in 1990 after German reunification, because most of the immigrants in our dataset were settled in West Germany during the sample period. Only 2.3 per cent of immigrant observations in our pooled dataset reside in East Germany—partly because a substantial number of immigrants arrived before German reunification and economic opportunities were generally better in West Germany after reunification. Moreover, LS differed substantially between East and West Germans after reunification (Easterlin and Pagnol 2008) and it is therefore more sensible to compare the LS of immigrants to that of German natives living in West Germany. We include only respondents aged 18–65 as the number of migrants aged 66 or older in the sample is fairly small, possibly due to return-migration to their native countries (Razum et al. 2005; Yahirun 2014). As mentioned above, the SOEP oversamples immigrants, which is why 21.2 per cent of observations in our pooled data in the 18–65 age range are immigrants, whereas the fraction of immigrants among those older than 65 is only 9.3 per cent. The share of immigrants for the whole of Germany in 2015 was 12.5 per cent according to UN estimates (United Nations 2017). Our final sample contains 326,413 person-year observations from 49,102 respondents.⁴

3.2 Measures

The following question is included in every wave: 'How satisfied are you at present with your life as a whole?' Individuals respond on a scale from 0 to 10, with 0 denoting the lowest and 10 the highest level of LS. We include in our analysis all observations which have non-missing values for the LS question and all independent variables that we use in our models. A respondent is classified as an immigrant if they were born outside of Germany. Our key independent variable measures the years that have passed since migration (YSM), defined as the survey year minus the year of immigration for immigrants, and set to 0 for natives.⁵

The immigrants in our sample mostly migrated from the former Soviet Union including Central Asia and the Baltic states (20 per cent), Turkey (17 per cent), the former

Yugoslavia (11 per cent), Poland (9 per cent), Italy (7 per cent), Greece (5 per cent), and Spain (4 per cent). We group Spain, Greece, and Italy into one category (Mediterranean) in our descriptive analysis because of relatively small sample sizes. Other immigrants arrived from France, Austria, Romania, and Middle Eastern countries but their numbers are small, and we therefore group them in a separate category of ‘other immigrants’.

The main health variable that we include is whether the respondent spent any night in hospital in the previous year, for the simple reason that this information is available in almost all survey years, but we also repeat the main regressions with a number of alternative health variables. The original hospitalisation variable records the number of nights spent in hospital. However, most observations do not spend any night in hospital and those who do stay mostly stay for one or only a few nights. We therefore dichotomise the variable so that it indicates not being hospitalised in the previous year. We further include a binary variable for not seeing a doctor in the previous three months, a binary variable for not having a disability exceeding 30 per cent (as in [Giuntella and Mazzonna 2015](#)), and self-assessed health which is measured on a five-point Likert scale. All variables are coded such that higher values indicate better health. The first three health measures are binary and correspond to more objective measures of health or health care utilisation. They are also available in most survey years, whereas the self-assessed health measure only starts in 1992.

To assess immigrants’ integration in German society, we include various measures of integration, such as language fluency (German and native language skills), intention to stay in Germany, and whether the respondent works in a job they were trained for. Our choice of control variables is informed by the LS literature (e.g. [Dolan et al. 2008](#)). We include as control variables age and age squared divided by 100 to accommodate a U-shape of LS in age ([Blanchflower and Oswald 2008](#)); a dummy variable for males; living with a partner (spouse or cohabiting); years of education; the log of equalised household income⁶; having children in the household; and several indicators of employment status (employed, unemployed; omitted category = not in the labour force).

[Table 1](#) shows the descriptive statistics of the pooled sample separately for natives and immigrants. We see that important differences between natives and immigrants exist in all dimensions: immigrants are significantly less satisfied, younger, more likely to be male, more likely to be living with a partner, less educated, have less income, less healthy, more likely to have children in the household, less likely to be employed, and more likely to be unemployed. These differences in sample characteristics likely reflect selection into migration and circumstances in the migrants’ countries of origin.

3.3 Analytical strategy

We first provide a descriptive analysis of the LS trajectories of natives and immigrants in the SOEP sample. We then estimate variations of the following model:

$$ls_{it} = \beta X_{it} + \gamma \text{Immigrant}_i + \delta \text{YSM}_{it} + a_i + d_t,$$

where ls denotes LS, X is a vector of individual characteristics, Immigrant is equal to 1 for immigrants and 0 for natives, YSM is years since migration (= 0 for natives), a_i is an individual-specific effect for person i , and d_t is a survey year-specific effect for survey year

Table 1. Descriptive statistics—averages for natives and immigrants.

| | Immigrants | Natives | Difference ^a |
|--------------------------------------|------------|---------|-------------------------|
| LS (0–10) | 7.08 | 7.21 | –0.13 |
| YSM | 19.5 | – | – |
| Age | 41.4 | 41.6 | –0.2 |
| Male (per cent) | 49.2 | 47.7 | 1.5 |
| Living with a partner (per cent) | 81 | 71 | 10 |
| Education (in years) | 10.4 | 12.2 | –1.8 |
| Ln(household income) | 6.62 | 6.93 | –0.31 |
| No hospitalisations | 88.6 | 89.4 | –0.8 |
| Has children in household (per cent) | 59 | 43 | 16 |
| Employed (per cent) | 68 | 75 | –7 |
| Unemployed (per cent) | 8.6 | 4.2 | 4.4 |

^aAll differences in the third column are significant at the 5 per cent level. $N_{im} = 62,718$, $N_{nat} = 263,695$.

t. We estimate this model with pooled OLS, fixed effects, and ordered logit estimators. For pooled OLS, we assume $a_i = a$. Pooled OLS and the fixed effects estimator assume cardinality of LS while the ordered logit does not make that assumption—it instead estimates threshold values for a latent LS variable such that respondents who fall between two consecutive thresholds all report the same level of LS. It has been found that assuming cardinality or ordinality usually yields very similar results in subjective well-being analyses (Ferrer-i-Carbonell and Frijters 2004). The ordered logit model thus can accommodate that individuals tend to be reluctant to report extreme values on the scale, or that changes in life circumstances can easily induce switches between some LS categories but not between others. The fixed effects estimator accounts for time-invariant unobserved heterogeneity a_i which might correlate with the independent variables. Note that in a fixed effects model, the demeaned age variable always increments by one and cannot be separately identified from a linear trend or from a full set of survey year dummies. The effect of YSM however can be identified as the linear change in immigrants' LS compared with natives. We also estimate a fixed effects ordered logit model, which combines both the non-cardinality of the ordered logit and the consideration of unobserved heterogeneity of the fixed effects model. The method has been labelled 'blow-up and cluster' by Baetschmann et al. (2015) and is based on a dichotomisation of LS at every possible cut-off point and applying the conditional logit of Chamberlain (1980) to the dichotomised dependent variable. We briefly describe this method in Supplementary Appendix A and refer the reader to Mukherjee et al. (2008) and Baetschmann et al. (2015) for a detailed discussion of this estimator.

All regressions include a full set of year fixed effects (d_t). We run each regression with and without socio-economic control variables to understand whether the YSM effect is just an artefact of differential changes between natives and immigrants in other variables.

The OLS estimates are reported to compare LS levels between natives and newly arrived immigrants, as this difference will be captured in the immigrant dummy, which is not identified in a fixed effects model as it is time-invariant.

We do not include weights in our regressions for several reasons. First, we use all available samples between 1984 and 2015 which have been added to the SOEP gradually. Cross-sectional weights are calculated to match cross-sections to the marginal distributions obtained from external data sources such as the German Microcensus while longitudinal weights combine initial cross-sectional weights and attrition probabilities derived from characteristics of interviewees and the interview process itself (such as duration of the last interview). Two otherwise similar households who joined the SOEP in different years therefore can (and do) have different weights. This is further complicated by the fact that our estimation sample is reduced by roughly 16 per cent after we exclude observations which have missing values for any of the variables we use in our analysis. Even if we had accurate weights for all observations, applied to our estimation sample they would not be representative of the population. Finally, point-identifying the YSM effect should be fairly robust to differences in the sampling and attrition probabilities of natives and immigrants. Since the YSM effect is the change in the LS with increasing years in Germany of immigrants relative to natives, it is identified entirely by the immigrants in our sample. For consistency, it does not really matter how many immigrants the sample observation represents if attrition is not linked to YSM, though it might on efficiency grounds (Solon et al. 2015). If the YSM effect is genuine, then we should find it regardless of whether we have 100 or 1,000 immigrants in our sample. Whether attrition is indeed linked to YSM is of course an empirical question and we do address this possibility in Section 4.4.

We set the YSM variable to 0 for natives and include an immigrant dummy in models without individual fixed effects. The estimated coefficient of the immigrant dummy thus informs us how much more or less satisfied a recently arrived immigrant is compared with a native (as both would have $YSM = 0$). In the fixed effects models, the YSM effect is identified as the differential in the change of LS between natives and immigrants from one year to another. To see this, suppose we have a model with a linear age effect and YSM, the age coefficient would tell us by how much the LS of natives changes from one year to another. The sum of the age and the YSM coefficients would tell us by how much the LS of immigrants changes. As such, the YSM effect refers to this differential change, and it can be regarded as the change in LS over time for immigrants over and above the change in LS for natives. Our analysis first establishes that such an effect exists and then explores the reasons for its existence.

4. Results

LS changes over time are clearly related to age and we therefore start our analysis by depicting the age-LS profiles of natives and immigrants in the pooled data (Fig. 1, left panel). We see that young immigrants are similarly satisfied as natives. However, the LS of immigrants older than 33 is consistently below that of natives, and this distance suddenly increases for observations in their 50s—all the differences in LS between ages 51

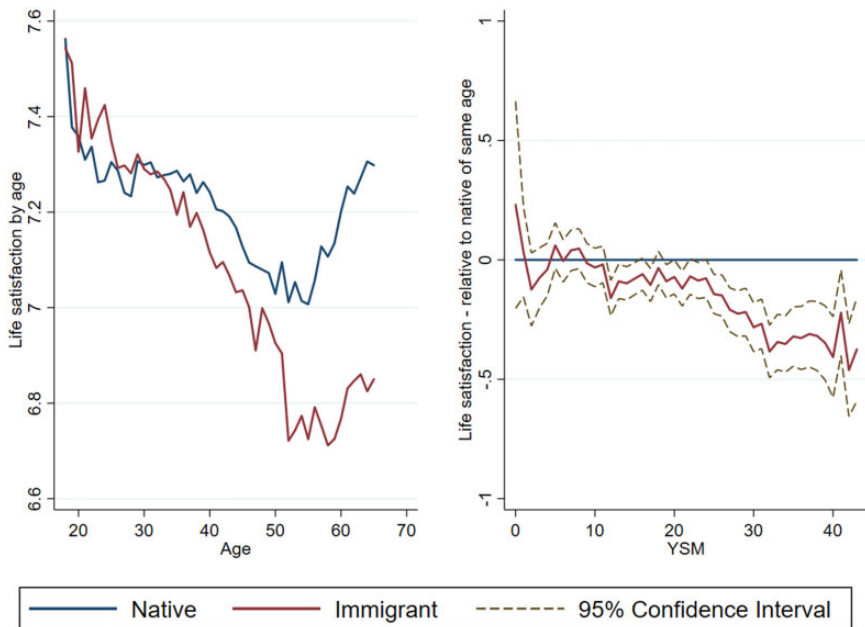


Figure 1. LS profiles for natives and immigrants. The left panel depicts mean LS by age for natives and immigrants. The right panel depicts the value of the immigrant coefficient plus the coefficients of the YSM dummies in a regression of LS on year fixed effects, a full set of age dummies, an immigrant dummy, and a full set of YSM dummies. The solid line quantifies how much more or less satisfied an immigrant is to a comparable native at different values of YSM.

and 65 are significant at the 1 per cent level. For natives, we also see the LS U-pattern in age that has been documented in previous studies (Blanchflower and Oswald 2008). The LS increase at older ages is less pronounced for immigrants.

The figure does not necessarily imply that immigrants who have been living in Germany for a longer time are increasingly becoming less satisfied. The same age-LS profile would arise if all immigrants (of different ages) arrived at the same time, but older immigrants were much less satisfied upon arrival. The figure on the right reveals that the above pattern is indeed related to YSM. The graph depicts how much less satisfied an immigrant is over their course of stay in Germany compared with a native, controlling for a full set of age and survey year dummies. The graph mimics the pattern depicted in the left panel: Recently arrived immigrants report the same level of LS as natives, but their satisfaction drops 10 years after arrival, and even more so after 20 years. We conclude that immigrants who have been living in Germany for a longer time are genuinely less satisfied than their native peers.

The graphical analysis cannot rule out the presence of confounding factors or that the YSM effect is a cohort effect: Immigrants who arrived a long time ago in Germany might have been already less satisfied than their native peers at their time of arrival, whereas those who arrived recently have satisfaction levels comparable to those of natives. The

ensuing regression analyses demonstrate that the YSM effect truly reflects a within-individual rather than between-individual effect and that it is robust to the inclusion of control variables.

Before turning to a more in-depth analysis of possible explanations for the YSM effect, we first run regressions on our sample of immigrants and German natives, applying different estimators (Table 2). We observe that, on average, recently arrived immigrants report higher levels of LS than similar natives as reflected in the significant, positive coefficient for the immigrant dummy in the regressions that include socio-demographic control variables (Columns 2 and 6). However, the YSM coefficient is found to be negative in all models, implying that every additional year in Germany is associated with a reduction in LS for immigrants, that is, immigrants' LS decreases compared with natives with the duration of their stay in Germany. The results in Columns 2 and 6 show that immigrants' LS drops to reach natives' LS levels after 28 and 27 years, respectively, while in regressions without socio-demographic variables immigrants reach parity with natives after seven years (Columns 1 and 5). The results from the fixed effects regressions (Columns 3, 4, 7, and 8) demonstrate that this is a genuine YSM effect rather than a composition effect. The OLS and fixed effects results are similar to the ordered logit results. The remaining coefficients suggest associations between sample characteristics and LS as expected. Living with a partner, having more income, better health, (not) being (un)-employed, and having children are significantly associated with higher LS. Women are more satisfied than men. Close to 9 per cent of the variation in LS is explained by the best-fitting model (Column 2), a typical number for LS regressions (Diener et al. 1999). The effect of YSM on LS is significant, but modest in absolute value. This is apparent when we standardise LS: Including all controls, an additional 10 years in Germany implies a decrease in LS of only 4.5 per cent of a standard deviation in LS (fixed effects), and a recently arrived immigrant is 13 per cent of a standard deviation more satisfied than an otherwise comparable native (pooled OLS). We also estimated a model including YSM squared. This did not change the linear YSM coefficient and did not significantly improve model fit, so we proceed with models linear in YSM.

We now take a closer look at several possible explanations for the negative YSM effect. We first investigate the role of health (Section 4.1). The YSM effect might be spurious if immigrants' health declines more than natives' health, and the health variable in our benchmark model (nights hospitalised) fails to account for this. However, we also consider the possibility that the importance attributed to health might be different between immigrants and natives.

4.1 Health

Our finding of decreasing LS of immigrants relative to natives mirrors similar observations which have been made about immigrants' health (e.g. Giuntella and Mazzonna 2015). A natural interpretation would thus be that the steeper decrease in LS for immigrants reflects a steeper decrease in their health status. The YSM effect in Table 2 is significantly negative while controlling for hospitalisations, but perhaps hospitalisations do not accurately reflect the health status of an immigrant.

Table 2. Determinants of LS—SOEP 1984–2015.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|---------------------|
| | Pooled OLS | | Fixed effects (FE) | | Ordered logit | | FE ordered logit | |
| Immigrant | 0.073*** (0.016) | 0.228*** (0.016) | | | 0.070** (0.017) | 0.241*** (0.017) | | |
| YSM | −0.010*** (0.001) | −0.008*** (0.001) | −0.011*** (0.001) | −0.008*** (0.001) | −0.010*** (0.001) | −0.009*** (0.001) | −0.012*** (0.003) | −0.008** (0.003) |
| Age | −0.030*** (0.002) | −0.114*** (0.002) | | | −0.034*** (0.002) | −0.122*** (0.002) | | |
| Age2/100 | 0.028*** (0.002) | 0.121*** (0.002) | 0.004 (0.002) | 0.050*** (0.003) | 0.032*** (0.002) | 0.130*** (0.002) | 0.009 (0.006) | 0.071*** (0.007) |
| Male | | −0.086*** (0.006) | | | | −0.100*** (0.006) | | |
| Living with partner | | 0.466*** (0.008) | | 0.333*** (0.011) | | 0.471*** (0.008) | | 0.452*** (0.025) |
| Ln(HH income) | | 0.603*** (0.007) | | 0.368*** (0.009) | | 0.641*** (0.008) | | 0.520*** (0.019) |
| No hospitalisations | | −0.378*** (0.010) | | 0.155*** (0.008) | | 0.351*** (0.010) | | 0.218*** (0.014) |
| Children in HH | | 0.277*** (0.007) | | 0.122*** (0.009) | | 0.302*** (0.008) | | 0.162*** (0.019) |

Continued

Table 2. Continued

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|----------------------------|------------|----------------------|--------------------|----------------------|---------------|----------------------|------------------|----------------------|
| | Pooled OLS | | Fixed effects (FE) | | Ordered logit | | FE ordered logit | |
| Employed | | 0.127*** (0.008) | | 0.112*** (0.009) | | 0.091*** (0.009) | | 0.153*** (0.018) |
| Unemployed | | -0.831*** (0.015) | | -0.535*** (0.015) | | -0.817*** (0.016) | | -0.632*** (0.028) |
| Education (in years) | | 0.022*** (0.001) | | | | 0.026*** (0.001) | | |
| Observations | 326,413 | 326,413 | 326,413 | 326,413 | 326,413 | 326,413 | 326,413 | 326,413 |
| Number of persons | | | 49,102 | 49,102 | | | 49,102 | 49,102 |
| (Pseudo) <i>R</i> -squared | 0.011 | 0.086 | 0.019 | 0.040 | 0.003 | 0.022 | 0.016 | 0.031 |

Notes: Standard errors in parentheses.

*** $p < 0.01$,
 ** $p < 0.05$,
 * $p < 0.1$.

The *R*-squared for the fixed effects models in Columns 3 and 4 are squared correlations between the de-meaned LS and predicted de-meaned LS from the fixed effects estimation. Stata reports this measure as *R*-squared within. The omitted category for employment status is ‘not in the labour force’.

Figure 2 depicts the health status trajectories of natives and immigrants for four different health measures: A binary variable for not being hospitalised in the previous year (top left), a binary variable for not seeing a doctor in the previous three months (top right), a binary variable for not having a disability exceeding 30 per cent (bottom left), and self-assessed health on a five-point Likert scale.

The probability of hospitalisation (top left) is similar for immigrants and natives of the same age, and there is little indication that there is any significant difference between the two groups regardless of how many years ago the immigrant arrived in Germany. A stronger association between health and YSM exists for ‘no visits to the doctor’ (top right) and also for disability (bottom left). Immigrants who arrived only recently have significantly better health outcomes on these two dimensions than natives, but their advantage erodes over time and converges to natives’ health outcomes. However, it is self-assessed health (bottom right) which bears the greatest resemblance to the LS trajectory of immigrants. Recently arrived immigrants report better health than natives, but their health first drops to levels comparable to natives, and even below that after 10 years.

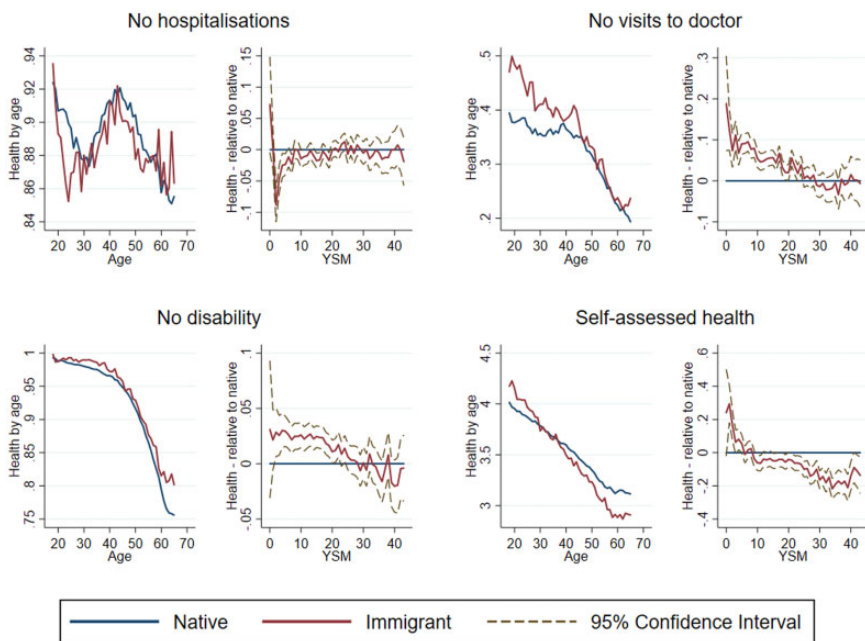


Figure 2. Evolution of health for immigrants and natives. The figure depicts average health for immigrants and natives by age ('Health by age') and the health status of an immigrant relative to a native of the same age for different values of years since migration ('Health—relative to native'). The health variables are: Not having been hospitalised in the previous year (top left), not having visited the doctor in the last three months (top right), not being disabled with a degree of at least 30 per cent (bottom left), and self-assessed health on a scale from 1 to 5. The dashed lines are the 95 per cent confidence intervals.

Table 3. Health and YSM effects on LS.

| Health variable in regression | (1) No hospitalisations | (2) No visits to doctor | (3) Not disabled | (4) Self-assessed health |
|-------------------------------|----------------------------|----------------------------|---------------------|-----------------------------|
| Effect of YSM on LS | -0.0078*** | -0.0072*** | -0.0081*** | 0.0021 |
| (<i>p</i> -value) | (0.000) | (0.000) | (0.000) | (0.190) |
| Effect of health on LS | 0.1548*** | 0.1185*** | 0.282*** | 0.4824*** |
| (<i>p</i> -value) | (0.000) | (0.000) | (0.000) | (0.000) |

Note: Results of a fixed effects regression of LS on YSM and health. All regressions control for the variables included in Table 2, Column 4.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$.

Table 3 summarises our findings of the effect of health and YSM on LS. Health clearly exerts an independent and important effect on LS. However, only the subjective health measure explains ‘away’ the effect of YSM on LS: Immigrants perceive a sharper decline in their health over time, and this is accompanied by an equivalent decline in their LS. This is perhaps not surprising given the similarity in LS and self-assessed health trajectories that we observe in Figs 1 and 2.

Why do the trajectories between objective and subjective health measures differ and which is the most appropriate to use in our LS context? First, self-assessed health is likely to be based on both physical and mental health, and to suffer from reverse causality with respect to LS. A person who is not satisfied with their life might experience low mood and depression which in turn lead them to report low levels of health. The other health variables are more closely associated with physical health, and it is less likely that one’s satisfaction with life would have an impact on physical health. Second, if immigrants are less likely to utilise health care—due to language or cultural barriers, for example—then we could observe declining self-assessed health which is not accompanied by higher probabilities of seeing a doctor or being hospitalised. Finally, self-assessed health has been surveyed in the SOEP only since 1992, while the remaining health variables have been surveyed since the SOEP’s inception. Indeed, if we run our LS regressions only on observations after 1992, ‘years since migration’ is no longer significant regardless of which variable we use for health (not reported). Figure 3 illustrates the difference between the survey years. YSM in 1985 is nearly unimodal with a mode at approximately 15, while the density in 1995 is bimodal with modes at approximately 5 and at 25 years. The first mode probably reflects the addition of 531 new immigrant households to the SOEP in 1994/95 and the second mode is simply the mode from 1985 10 years later. If the YSM effect is largely driven by the initial immigrant sample and after 15–25 years since migration, then we should not find any effects for the later survey years.

Given the problems associated with self-assessed health, we focus on the remaining health variables and test the following alternative explanations: (1) Immigrants and natives place different weights on their health when evaluating their LS. That is, the

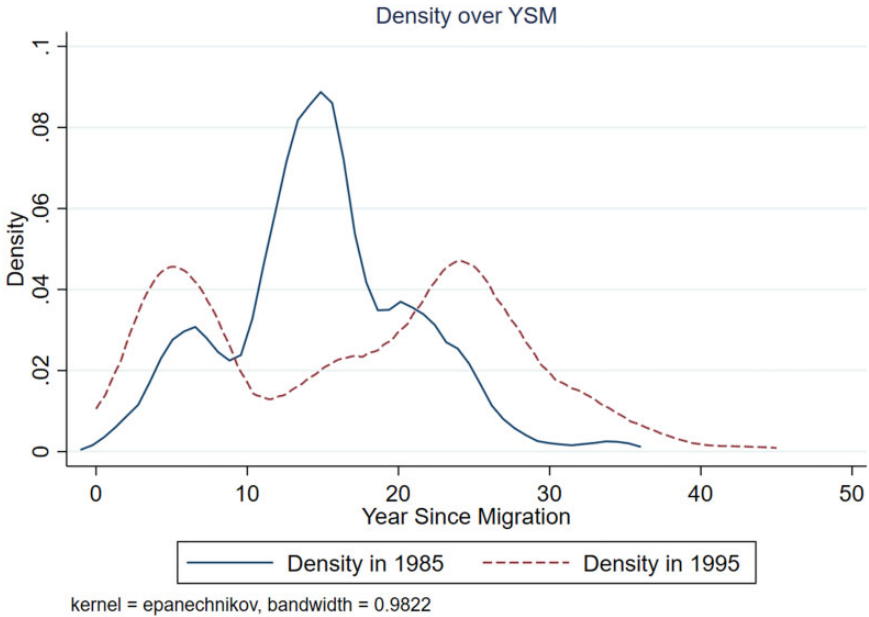


Figure 3. Density over YSM. Kernel density plots over years since migration (immigrants only) for survey years 1985 (solid blue) and 1995 (dashed red).

coefficient for health in a LS regression is significantly different between immigrants and natives. If both immigrants and natives experience comparable declines in health, but immigrants place a greater weight on their health, then this would explain the steeper decline in LS for immigrants. The results in Table 4 suggest that there is indeed a significant difference in the effect of health on LS between natives and immigrants. For all three health variables, immigrants' LS is more sensitive to changes in health (odd-numbered columns). However, this does not eliminate the YSM effect. (2) Our second alternative explanation is that the sensitivity of LS to health changes over time, and it does so differently for immigrants than for natives. This would lead to a significant difference between a health–age interaction which affects all survey respondents, and a health–YSM interaction which affects only immigrants. The even-numbered columns in Table 4 do not support this explanation in a statistical sense—even though immigrants' sensitivity to health does increase more than natives' by a substantial amount. The YSM effect itself remains unaffected by allowing for different health effects between immigrants and natives on YSM. We therefore conclude that health differences between natives and immigrants cannot account for the steeper decline in LS of immigrants.

4.2 Stability over time and across samples

In a year-by-year OLS estimation, we find that the negative effect of YSM and the positive immigrant coefficient are stable only after 1992 (Fig. 4). The explanatory power of the

Table 4. Health and YSM effects on LS, with interactions.

| Health variable in regression | No hospitalisations | | No visits to doctor | | Not disabled | |
|-------------------------------|---------------------|------------|---------------------|------------|--------------|------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| YSM | -0.0078*** | -0.0105*** | -0.0070*** | -0.0075*** | -0.0076*** | -0.0102*** |
| (<i>p</i> -value) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.004) |
| Health | 0.1454*** | -0.1875*** | 0.1093*** | 0.0318 | 0.2954*** | 0.6413*** |
| (<i>p</i> -value) | (0.000) | (0.000) | (0.000) | (0.135) | (0.000) | (0.000) |
| Health × Immigrant | 0.0467** | -0.0064 | 0.0469*** | 0.0208 | 0.1402*** | 0.0591 |
| (<i>p</i> -value) | (0.026) | (0.880) | (0.002) | (0.489) | (0.001) | (0.576) |
| Health × Age | | 0.0078*** | | 0.0019*** | | 0.0066*** |
| (<i>p</i> -value) | | (0.000) | | (0.000) | | (0.000) |
| Health × YSM | | 0.0030 | | 0.0014 | | 0.0030 |
| (<i>p</i> -value) | | (0.103) | | (0.316) | | (0.392) |

Notes: Results from fixed effects regressions. The dependent variable is LS. All regressions control for the variables included in Table 2, Column 4.

*** *p* < 0.01,
 ** *p* < 0.05,
 * *p* < 0.1. *P*-values are in parentheses.

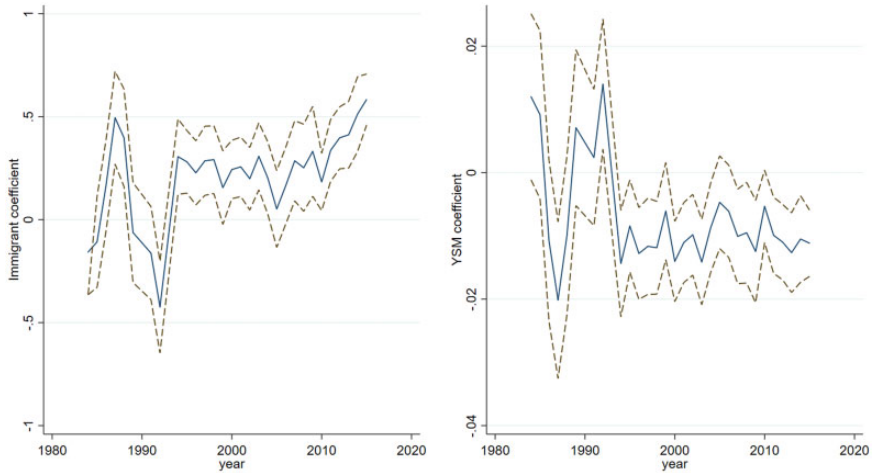


Figure 4. Immigrant and YSM coefficients by year. The figure depicts the immigrant (left) and YSM coefficients (right) for separate year-by-year regressions of LS on the same independent variables as in Table 2. The dashed lines are the 95 per cent confidence intervals.

model is much stronger in the later third of the panel, and weaker in the first few waves (not reported). Running fixed effects regressions on different time periods reveals that there is a positive relationship in the first four survey years: the YSM coefficient's P -value is just above 0.10, suggesting, if anything, a positive relationship between YSM and LS in the early years of the panel. The negative effect is most pronounced in the transformative years of 1988–92 which saw the fall of the Berlin wall and German reunification but also a rise in racist violence and rhetoric against immigrants and their descendants.

The SOEP includes immigrants which were added to the panel at different times (see Section 3.2). The three major immigrant samples in our data are the original ‘foreigner’ sample, the ‘refresher immigrant’ sample from 1994/95, and the ‘migration’ samples from 2013 and 2015—note that observations from the 2015 sample would be present in our panel only once, and thus do not contribute to the within-identification of our regression coefficients. We test whether there are systematic differences in the YSM effect between these immigrant samples. Table A.1 in the Appendix shows the YSM effect from fixed effects regressions which only retain one of the major immigrant samples.⁷ Column A is the YSM effect when we include only the original foreigner sample. Column B only retains the refresher immigrant sample and Column C only includes the—relatively recent—migrant sample. The YSM effect is weaker for the immigrant sample, but it remains present and significant at the 5 per cent level in all three cases.

4.3 Attrition

Is it possible that the YSM effect is driven by different attrition profiles between immigrants and natives? If immigrants whose LS does not drop over time are more likely to

drop out of the survey than comparable natives (e.g. through returning to their countries of origin) then the sample would contain ‘too many’ immigrants who will experience a sharper decline in LS and thus result in a spurious negative effect of YSM on LS. To investigate this possibility, we first analyse the factors predicting the probability of dropping out of the survey by estimating the following Weibull attrition hazard model

$$h(t) = \lambda_0(t)\exp(X\beta),$$

where h is the probability of dropping out of the panel at time t , conditional on having remained in the panel until then. $\lambda_0(t)$ is the baseline hazard specified as $\lambda_0(t) = \lambda t^{\lambda-1}$, X is a row vector of characteristics, and β is a vector of coefficients. We are interested in (a) whether the attrition hazard differs between immigrants and natives and (b) whether any existing difference is related to LS and YSM. Note that we are not interested in what explains the difference in attrition rates between immigrants and natives per se, but only whether existing differences—whatever their causes may be—can explain the YSM effect.

We then re-estimate our main model but this time account for the attrition probability of respondents. The first regression includes a binary variable which is equal to 1 for the last interview of a respondent in the panel. The second regression interacts this attrition dummy with the immigrant dummy. Finally, a third regression constructs an attrition probability based on a respondent’s characteristics following the steps in [Wooldridge \(2002\)](#) which we describe in more detail in [Supplementary Appendix B](#).

The results of the hazard model are presented in [Table 5](#). The first column reveals that immigrants are more likely to drop out of the survey, undoubtedly due to non-negligible return or repeat migration. We find that immigrants who have been in Germany longer are less likely to attrite. Adding LS as a covariate also shows that the less satisfied are more likely to drop out (Column 2). However, including an interaction term (Column 3) reveals that less satisfied immigrants are even more likely to drop out. If anything, this should bias the YSM coefficient upwards, as there will be fewer immigrants who are less satisfied and have been living in Germany for a long time.

Respondents who are going to attrite in the next survey wave are less satisfied ([Table 6](#), Column 1), echoing the result from the hazard model. Column 2 further shows that this effect is not significantly different between immigrants and natives: an immigrant who will attrite is only marginally more satisfied than a native who is going to attrite. Column 3 of [Table 6](#) shows the results from the attrition-corrected model. The YSM effect is slightly above the benchmark result. The YSM effect is thus not driven by any systematic attrition difference between natives and immigrants or within the immigrant sample.

4.4 Integration in German society

We next analyse how the YSM effect changes when we include variables related to how well-integrated immigrants are in German society and in which country they see their future. If those immigrants who fail to integrate experience a sharper decline in LS, then we should expect the YSM effect to attenuate once we control for integration measures. [Kóczán \(2016\)](#) finds that immigrants’ LS is no different from natives’ once a variable indicating whether the respondent works in a job they were trained in is controlled for. We

Table 5. Weibull attrition hazard models.

| | Weibull duration model | | |
|----------------|------------------------|----------------------|----------------------|
| | (1) | (2) | (3) |
| Immigrant | 0.259*** (0.028) | 0.263*** (0.028) | 0.372*** (0.058) |
| YSM | -0.007*** (0.001) | -0.007*** (0.001) | -0.007*** (0.001) |
| LS | | -0.022*** (0.003) | -0.017*** (0.004) |
| LS × Immigrant | | | -0.015** (0.007) |
| Observations | 326,413 | 326,413 | 326,413 |

Notes: The coefficients are the effects of the associated variable on the probability to exit the panel in the next period. Standard errors in parentheses.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$.

Other controls as in Table 2. Full table of results available upon request.

Table 6. Non-random attrition models.

| | (1) Fixed effects | (2) Fixed effects | (3) Fixed effects with inverse Mills ratios |
|-----------------------|----------------------|----------------------|---|
| YSM | -0.008*** (0.001) | -0.008*** (0.001) | -0.011*** (0.003) |
| Attrition | -0.106*** (0.010) | -0.110*** (0.011) | |
| Attrition × Immigrant | | 0.022 (0.023) | |
| Observations | 311,795 | 311,795 | 253,096 |
| Number of persons | 46,288 | 46,288 | 38,257 |
| R-squared | 0.041 | 0.041 | 0.034 |

Notes: Dependent variable: LS. Other controls as in Table 2. Full table of results available upon request. Standard errors in parentheses; standard errors in Column 3 are bootstrapped from 500 replications.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$.

The last year of the panel is excluded, as the Attrition variable for that year is not defined. The R-squared for the fixed effects models are squared correlations between the de-meaned LS and predicted de-meaned LS from the fixed effects estimation. Stata reports this measure as R-squared within.

therefore repeat our benchmark regression but also include different measures of integration. Some of these variables are only recorded for immigrants (language fluency and intention to stay in Germany) and we can therefore only consider the immigrant sample. We use pooled OLS where this is the case to separately identify age from YSM effects.

We do not find that the YSM coefficient is affected by inclusion of a variable indicating whether the respondent works in a job they were trained in (Table 7, Column 1). Moreover, inclusion of self-assessed speaking fluency of German and one's native language does not affect the YSM coefficient (Table 7, Column 2). Including a dummy for the intention to stay in Germany forever reduces the YSM coefficient slightly compared with the 0.008 benchmark value. Still, the YSM coefficient remains statistically significant.

4.5 Ethnic background

We next check whether there are important differences across ethnicities. We run fixed effects regressions on separate ethnicity samples, excluding the survey years 1984–7 because there is no negative YSM effect in these years.⁸ To separate age from YSM effects we also include natives in each regression. The negative YSM effect is most pronounced for immigrants from the former Yugoslavia (-0.018^{***}) and from the Mediterranean countries other than Turkey (-0.018^{***}). Turks start out with lower levels of LS which explains the slow decrease over time (-0.006^{**}). There is no clear effect for immigrants from other countries (-0.001), perhaps because most of them migrated from Eastern Europe and are likely to be ethnic Germans or descendants of Germans.

5. Discussion

The aim of our study was to investigate the average pattern of LS of immigrants in Germany with attention to how it changes over the course of their stay in the host country. We found that shortly after arrival, immigrants report higher levels of LS than natives but that their LS decreases relative to comparable natives over time. Thus, there is a negative YSM effect. The magnitude of the effect is small, but statistically significant. Furthermore, it does not depend on the use of cardinal or ordinal models.

The second research aim was to find explanations for their decreasing LS over time. For this purpose, we tested five potential explanations. We first proposed and estimated an innovative model that simultaneously allows LS to depend on health, but at the same time allows the weight of the health coefficient to change over time differently for natives and immigrants. Based on this model, we found that the negative YSM effect can be explained by a combination of immigrants' failing health and an increase in the weight that health receives in evaluating LS. However, this result is sensitive to the exact health measure that we use. Moreover, LS potentially affects health positively, inducing an upwards bias in the health coefficient in LS regressions. If the extent of the bias does not differ between immigrants and natives, then our findings on differences between these groups would not be affected by bias. Inclusion of different measures of health can change the YSM effect, but this happens because different health variables are available for different survey years, and the YSM effect is not stable throughout all survey years.

Table 7. LS and integration in German society.

| | (1) Fixed effects (full sample) | (2) Pooled OLS (immigrant sample) | (3) Pooled OLS (immigrant sample) |
|--------------------------|---------------------------------------|---|---|
| YSM | -0.006*** (0.002) | -0.012*** (0.002) | -0.007*** (0.001) |
| Employed | 0.072 (0.043) | 0.214*** (0.035) | 0.307*** (0.022) |
| Unemployed | | -0.787*** (0.054) | -0.600*** (0.033) |
| Education | | -0.014** (0.007) | 0.009** (0.004) |
| German language skill | | 0.204*** (0.015) | |
| Native language skill | | 0.089*** (0.019) | |
| Works in occupation | -0.019*** (0.006) | | |
| Wants to stay in Germany | | | 0.317*** (0.018) |
| Observations | 227,214 | 21,749 | 47,902 |
| Number of persons | 39,055 | | |
| R-squared | 0.028 | 0.086 | 0.102 |

Notes: Standard errors in parentheses;

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$.

Other controls as in Table 2. Full table of results available upon request. The R -squared for the fixed effects models are squared correlations between the de-meaned LS and predicted de-meaned LS from the fixed effects estimation. Stata reports this measure as R -squared within.

We considered further alternative explanations for the YSM effect. Sample attrition seemed a natural candidate to explain the YSM effect, but we saw that while systematic differences in attrition behaviour exist between natives and immigrants, and between satisfied and dissatisfied people, satisfied immigrants are not more or less likely to attrite than satisfied natives once we control for immigration status and LS. Correcting for attrition bias actually increases the YSM effect somewhat. Inclusion of other variables to proxy for immigrants' integration in Germany did not alter our YSM finding either. Ethnic background, on the other hand, is an important factor. We find no YSM effect for immigrants from the former Soviet Union and from Poland, and the strongest effect for immigrants from the former Yugoslavia. For immigrants from Yugoslavia, this could

reflect the effect of war as an external shock that occurred in the early 1990s and considerably affected their subjective well-being (Shemyakina and Plagnol 2013): the violence in their home countries might have reduced the LS of Yugoslavians over and above any proper YSM effect. However, this cannot explain the strong effect found for immigrants from other Mediterranean countries.

5.1 Policy implications

The present analysis contributes to our understanding of immigrants' LS after migration. This is of important policy concern as their LS may to some extent reflect the success or failure of integrating immigrants in host societies. The results suggest that there is scope for policies to improve immigrants' LS later in life by better addressing their specific healthcare needs. A recent scoping review notes that health policies designed for the general population might not address the healthcare needs of migrants (Diaz et al. 2017). The authors of the review state that health interventions can follow two approaches: (1) They can be designed to be effective for both the majority and immigrant populations (inclusive policies) or (2) Interventions could be culturally adapted for specific groups to appropriately meet their needs. For instance, health literacy, which describes the ability to understand healthcare information and navigate the healthcare system, has been found to be particularly low among older immigrants in Germany compared with other German residents (Quenzel et al. 2016). A culturally adapted intervention could thus target the health education of older immigrants, after an analysis has been conducted to understand the specific cultural barriers to their health literacy.

The World Health Organization proposes a number of priority actions to promote the health of refugees and migrants, including '(1) Building healthy public policies and addressing migration through intersectoral action, (2) creating supportive environments, (3) empowering communities for a participatory approach to health, (4) promoting personal skills and health literacy, and (5) strengthening cultural competence and responsiveness of health systems' (World Health Organization, Regional Office for Europe 2018: 14; Fig. 2). Similarly, policies, based on the principles of equity and equality, that intent to improve migrants' access to healthcare in Ireland, Portugal, and Spain include training healthcare professionals in cultural competencies, hiring healthcare staff who are themselves immigrants, and translating information material (Ledoux et al. 2018). Rechel et al. (2013) propose similar approaches and also call for explicit migrant health policies in European countries with a large migrant population to avoid health inequities. These and other proposals clearly state that interventions need to be empirically informed (see also Spitzer et al. 2019). The systematic collection of LS measures among immigrants alongside other information, possibly as part of the collection of such information in the general public, would allow policymakers and charities to assess the cost effectiveness of various health and other interventions with regards to gains in migrants' LS (Frijters et al. 2020). Our study provides further evidence that such a systematic data collection is needed as some of the reasons for the differences in LS outcomes between immigrants and natives cannot yet be fully explained by available measures.

5.2 Limitations and directions for further research

Our study shows both strengths and limitations. One strength is that we examine possible explanations of the YSM–LS effect that have heretofore not been considered. However, our analysis of alternative explanations was restricted by the availability of suitable measures. For example, some of the health variables we used were not available in all survey years. Moreover, some of the results are sensitive to the exact health measure that we used and it could be argued that other health measured might have been more informative than the ones available in the dataset. Moreover, our data do not include pre-migration LS and we do therefore not know if migrants experienced a temporary boost in LS shortly after arrival. Perhaps the decline in LS since the year of migration reflects a gradual adaptation to previous levels of LS—that is, hedonic adaptation over time (e.g. Lucas 2007; Diener et al. 2009b). However, we note important differences between the post-migration trajectory of their LS compared with the reported LS of German natives—a disparity that should be addressed by policy interventions.

Other studies have found that immigrants generally report lower LS than natives (e.g. Verkuyten 2008; Safi 2010), suggesting that the LS differential between migrants and natives may depend on the specific local context. Our study should therefore be repeated in other countries to investigate if differences in LS trajectories can also be observed there. Future research should also include additional measures of health and immigrants' integration, perhaps depending on the local context.

6. Conclusion

We found that recently arrived immigrants in Germany are more satisfied with their lives than comparable German natives. However, we observed a negative YSM–LS association as their LS decreased more over time than that of their German counterparts. We tested five possible explanations for this observation, some of which had not been previously explored, and we found that the YSM–LS effect is related to deteriorating health and an increase in the importance of health for LS. The disparity in the health outcomes of migrants compared with natives could be addressed by targeting the specific healthcare needs of migrants, such as providing translations, targeting suspicion about the healthcare system, and making migrants aware of the healthcare benefits they are entitled to.

Notes

1. A negative YSM effect is also found by Taengnoi (2014) for the USA.
2. General information on the SOEP can be found here: https://www.diw.de/en/diw_01.c.615551.en/research_infrastructure_socio-economic_panel_soep.html (last accessed October 2022). Information on version 32, which we use in this research can be accessed here: https://www.diw.de/en/diw_01.c.548849.en/soep_v32.html#548871 (last accessed October 2022)

3. The different sub-samples are described in detail in the SOEP companion which can be accessed at <http://companion.soep.de/Target%20Population%20and%20Samples/index.html> (last accessed October 2022)
4. Regressions on a sample with observations aged 18–85 produced similar results as those presented in [Table 2](#).
5. Note that this variable is also 0 for immigrants who arrived less than a year before the survey date. Those immigrants are distinguished from natives by inclusion of an immigrant dummy.
6. We use the OECD equivalence scale. The first adult person is counted fully, every other person in the household above the age of 14 with 0.7, and any further household member with 0.5.
7. We use ‘not disabled’ as the health outcome in these regressions because hospitalisations for the most recent migration sample are only recorded in 2015.
8. Full table of results available upon request.

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Supplementary data

[Supplementary data](#) is available at *Migration Studies* online.

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Appendix

Table A.1. Effect of YSM on LS by immigrant sample.

| Model | (1) Foreigner sample | (2) Immigrant sample | (3) Migration sample |
|---------------------|-------------------------|-------------------------|-------------------------|
| Effect of YSM on LS | -0.010*** | -0.004** | -0.012*** |
| (<i>p</i> -value) | (0.000) | (0.035) | (0.000) |

Notes: Estimated effects of YSM on LS in fixed effects regressions on selected immigrant samples. The foreigner sample is the initial sample of immigrants from 1984. The immigrant sample was added to the SOEP in 1994 and 1995. The migration sample was included in 2013 and 2015. The regressions include immigrants who do not belong to any of these subsamples.