THE NONECONOMIC AND ECONOMIC WELLBEING OF IMMIGRANTS

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THE NONECONOMIC AND ECONOMIC WELLBEING OF IMMIGRANTS

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Table of Contents

04 ***Editorial: The Noneconomic and Economic Wellbeing of Immigrants***
Dina Maskileyson and Debora Pricila Birgier

08 ***Transnational and Local Co-ethnic Social Ties as Coping Mechanisms Against Perceived Discrimination - A Study on the Life Satisfaction of Turkish and Moroccan Minorities in the Netherlands***
Ece Arat and Özge Bilgili

19 ***Corrigendum: Transnational and Local Co-ethnic Social Ties as Coping Mechanisms Against Perceived Discrimination - A Study on the Life Satisfaction of Turkish and Moroccan Minorities in the Netherlands***
Ece Arat and Özge Bilgili

21 ***The Impact of Pre- and Postarrival Mechanisms on Self-rated Health and Life Satisfaction Among Refugees in Germany***
Elena Ambrosetti, Hans Dietrich, Yuliya Kosyakova and Alexander Patzina

38 ***Why Are Newcomers so Happy? Subjective Well-Being of First-Generation Immigrants in Germany***
Hilke Brockmann

53 ***Unhealthy Immigrants: Sources for Health Gaps Between Immigrants and Natives in Israel***
Keren Semyonov-Tal and Dina Maskileyson

65 ***Gendered Body Mass and Life Satisfaction Among Youth in Three Western European Immigrant-Receiving Countries***
Jing Shen and Irena Kogan

76 ***Migrants' Social Integration and Its Relevance for National Identification: An Empirical Comparison Across Three Social Spheres***
Charlotte Clara Becker

91 ***The Motherhood Penalty of Immigrants in France: Comparing the Motherhood Wage Penalty of Immigrants From Europe, the Maghreb, and Sub-Sahara With Native-Born French Women***
Noa Achouche

111 ***The Need for Parental Support for Migrant Parents in Transition Into Sweden: A Perspective***
Elisabeth Mangrio, Karin Enskär, Rathi Ramji, Katarina Sjögren-Forss, Per-Anders Tengland, Kyriakos Theodoridis, Slobodan Zdravkovic and Margareta Rämgård

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Editorial: The noneconomic and economic wellbeing of immigrants

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Editorial on the Research Topic
The noneconomic and economic wellbeing of immigrants

Questions relating to immigrant integration are centrally positioned in the migration literature. Scholars of immigration focus on two main dimensions of wellbeing in order to assess the integration of immigrants into the host society: economic (i.e., labor force participation, occupational attainment, and earnings) and noneconomic (i.e., physical and mental health, subjective wellbeing, life satisfaction). While researchers have long addressed these dimensions, a number of important gaps in the evidence remain. For instance, the long-term consequences of immigration for immigrants' economic and noneconomic wellbeing are still insufficiently addressed. Therefore, this thematic issue aims to explore the consequences of migration for noneconomic and economic wellbeing. That is, this thematic issue presents different studies focusing on economic and health outcomes as well as subjective wellbeing and life satisfaction of different immigrant' groups and across different countries and contexts.

In terms of economic incorporation, it has been established that upon arrival at a host country, most immigrant groups must contend with lower incomes and employment rates in their new labor markets. The lower earnings of immigrants are attributed to skill disparities, lack of language proficiency, information gaps, and discrimination. However, as immigrants spend more time in the host society, labor market outcomes tend to converge toward the levels enjoyed by natives. The long-term consequences of immigration for immigrants' economic wellbeing and the distribution of economic resources across different immigrant groups are yet insufficiently addressed in the literature.

In terms of noneconomic wellbeing, studies report that while immigrants tend to be less satisfied with their lives in their destination countries relative to natives, in many cases, they still report higher life satisfaction than their counterparts in their country of origin. Most of the research on the health subject reports that

immigrants arrive healthier, but their health deteriorates with increasing length of stay and generational status in the destination country. This phenomenon is addressed in the literature as the healthy immigrant effect. Upon arrival in the host country, immigrants tend to have comparatively better health profiles (in terms of mortality rate, chronic conditions, and mental health) than the native-born population, despite their lower socioeconomic status, experiences of discrimination, and reduced access to healthcare systems. However, over time and change in generational status, this health advantage frequently deteriorates, despite the relative improvement in socioeconomic status. The reasons underlying the healthy immigrant effect remain a topic for vigorous research and debate.

This thematic issue covers studies that analyze in a theory-driven way and use survey data on such various aspects of immigrants' experience in the host society as life satisfaction and happiness (Arat and Bilgili; Brockmann; Ambrosetti et al.; Shen and Kogan et al.), parental support (Mangrio et al.), self-perceived health (Semyonov-Tal and Maskileyson; Ambrosetti et al.), social integration and national identification (Becker), and motherhood penalty in the labor market (Achouche). The studies analyze these questions from a comparative or longitudinal perspective.

The first paper, "*Transnational and Local Co-ethnic Social Ties as Coping Mechanisms Against Perceived Discrimination - A Study on the Life Satisfaction of Turkish and Moroccan Minorities in the Netherlands*", authored by Arat and Bilgili, examines whether and to what extent minorities' local and transnational co-ethnic social ties mitigate the negative effects of perceived discrimination on life satisfaction. The authors focus on the experiences of Turkish and Moroccan minorities and discuss whether co-ethnic social ties, both locally and transnationally embedded, can be considered as coping mechanisms against perceived discrimination. In addition, they investigate whether these mechanisms work differently for first- and second-generation minorities. Using Netherlands Longitudinal Life-course Study, Arat and Bilgili reveal that perceived discrimination is positively associated with local co-ethnic social ties in the Netherlands, which consequently predicts higher life satisfaction for both generations. They also demonstrate that discrimination is associated with stronger transnational co-ethnic social ties only among the second-generation, but not the first generation. The authors conclude, however, that having transnational ties is beneficial for the life satisfaction of both generations. Thus, they highlight the importance of recognizing transnational embeddedness of minorities and studying the effects of transnational co-ethnic social ties on subjective wellbeing outcomes, especially for second-generation minorities.

The second paper, "*The Need for Parental Support for Migrant Parents in Transition Into Sweden: A Perspective*", authored by Mangrio et al., discusses how the Swedish Child Health Services (CHS) can support newly arrived immigrant families and address the need for improvement in the parental support offered to migrant parents during the transition into the Swedish society. This study focuses on the advantages of using a community-based participatory research approach together with the Swedish CHS to identify and apply culturally appropriate support programs to increase health literacy among migrant parents. The authors suggest that healthcare professionals in Sweden should aim on taking an inclusive approach to provide parental support to migrant parents, where migrant parents themselves are actively involved in the development of support programs. Mangrio et al. argue that this approach will provide migrant families with knowledge and support based on their needs and challenges.

The third paper, "*Unhealthy Immigrants: Sources for Health Gaps Between Immigrants and Natives in Israel*" by Semyonov-Tal and Maskileyson, focuses on sources for health disparities between immigrants and native-born in the context of the "returning diaspora" model of Israeli society. The authors distinguish between three major origin groups of immigrants: the former Soviet Union, Western Europeans or the Americans (mostly Ashkenazim), and Asians or North Africans (mostly Sephardim). Using data from the Israeli National Health Interview Survey (2013–2015), Semyonov-Tal and Maskileyson provide a decomposition analysis of the illness gaps between native-born and subgroups of immigrants. Their findings reveal that the health status of all immigrant groups is poorer than that of native-born Israelis. The nativity–illness gap is most pronounced in the case of male immigrants (from Europe or the Americas or South Africa or Australia) and for female immigrants (from countries in the Middle East or North Africa) and least pronounced in the case of immigrants arriving from the former Soviet Union for both gender groups. Decomposition of the gaps into components reveals that some portion of the illness gap can be attributed to nativity status, but the largest portion of the gap is attributed to demographic characteristics. Neither socioeconomic status nor health-related behavior accounts for a substantial portion of the nativity–illness gap for all subgroups of immigrants.

The fourth study, "*Why Are Newcomers So Happy? Subjective Well-being of First-Generation Immigrants in Germany*", authored by Brockmann, tests if personality selectivity, purposive adaptation, and social resilience separately or in tandem explain why subjective wellbeing of newcomers remains high even in times of objective disadvantage. Using German panel data (GSOEP) from 5,008 first-generation immigrants for the years 1984–2014 and official data, growth curve models show that newcomers are a selected group concerning their open and less neurotic personalities and that these personal characteristics are distinctly associated with happiness. Also, newcomers immediately compare their income to the standards in the host society but not their

family life. This contributes to boosting their subjective wellbeing as well. For more than 30 years, first-generation immigrants have used their country of origin as a reference point, thus protecting the positive association of intimate relationships and happiness. Finally, newcomers are highly capable of recovering from social loss. Brockmann argues that the economic integration of newcomers should be fast and easy, while family reunification and integration should follow only with a time lag.

The fifth study, "*The Impact of Pre- and Postarrival Mechanisms on Self-rated Health and Life Satisfaction Among Refugees in Germany*", authored by Ambrosetti et al., examines the evolution of refugees' wellbeing in the first years after their arrival in Germany. In contrast to other immigrants (e.g., labor migrants), refugees experience higher risks of unexpected and traumatic events and insecurity before and during their migration and face various legal and structural barriers in the receiving country. This study contributes to the existing literature by exploring the possible pre- and post-arrival determinants of refugees' life satisfaction and self-rated health upon arrival in Germany and their development over time in the process of becoming established. Applying linear regression and panel models with recent longitudinal data from the IAB-BAMF-SOEP Survey of Refugees in Germany, Ambrosetti et al. find significant effects of prearrival factors, such as traumatic experiences and the complexity of migration, on both life satisfaction and self-rated health at the time of the first interview. Regarding postarrival factors, their results suggest that improvement in language proficiency and labor market status significantly shape refugees' life satisfaction and self-rated health. The time-dynamic analyses reveal substantial improvements in life satisfaction upon the approval of refugee status and the transition from shared housing to private accommodations. However, the authors find no improvements in self-rated health due to legal status but rather deterioration effects due to long-term residence in shared housing.

The sixth paper, "*Gendered Body Mass and Life Satisfaction Among Youth in Three Western European Immigrant-Receiving Countries*", by Shen and Kogan, demonstrates distinctive patterns of the association between body weight and life satisfaction for adolescent boys and girls. They examine such patterns by bringing multiple mediating factors into one theoretical framework centered on normative perceptions. By drawing data from the first wave of the CILS4EU that captures 14–15-year-olds in Germany, the Netherlands, and Sweden, findings show that psychological factors, indicated by self-esteem and mental state, explain the association between BMI and life dissatisfaction substantially for both boys and girls. Relationships with parents (particularly among boys) and relationships with peers (particularly among girls) also play significant roles. Interestingly, the association between being underweight and life satisfaction varies across ethno-racial groups among girls but not among boys. Girls originating from Eastern Europe tend to gain more life satisfaction when being underweight, whereas girls rooted in Sub-Saharan African and Caribbean countries display consistently low levels of life satisfaction when being underweight.

The seventh paper, "*Migrants' Social Integration and Its Relevance for National Identification: An Empirical Comparison Across Three Social Spheres*", authored by Becker, analyzes and compares the relationship between different forms of social integration and national identification of first- and second-generation migrants in Germany. Becker analyzed data from a 2013 cooperation between the Institute for Employment Research (IAB) and the German Socio-Economic Panel (SOEP), that is, the IAB-SOEP Migration Sample, as well as the 2014 wave of the SOEP. The subsample used included 2,780 first- and second-generation migrants living in Germany. The results indicate that not all kinds of contact are equally linked to national identification. In neither the cross-sectional models nor the lagged models living together with native family members significantly linked to national identification. Similarly, the association between having predominantly native co-workers and national identification was insignificant when controlling for migrant-specific characteristics. Only the relation with having predominantly native friends was significant and positive across all models. The author concluded that when it comes to migrants' national identification, native friends might be the most relevant form of contact with natives.

Finally, the eighth paper, "*The Motherhood Penalty of Immigrants in France: Comparing the Motherhood Wage Penalty of Immigrants from Europe, the Maghreb, and Sub-Sahara with Native-Born French Women*", authored by Achouche, examines whether the negative effect of motherhood on wages is higher for immigrants than it is for the native population; and how this effect may vary across different immigrant regions of origin. A series of linear regression models were calculated using data from the Enquête Revenus Fiscaux et Sociaux from 2009 to 2012 (INSEE, 2009–2012) to address these questions. The results revealed substantial differences in the motherhood penalty between the different regions of origin and asserted the existence of an especially pronounced motherhood penalty for mothers from the Maghreb. Given the gap in the research regarding the cost of motherhood for immigrants in the host country's labor market, this research sheds light on specific mechanisms influencing the integration patterns of immigrant women. Moreover, by choosing France, which is one of the main immigration destinations in Europe, and a country where the motherhood penalty for the native population is almost non-existent, this study provides a new perspective on the intersection of motherhood, immigration, and region of origin in the immigrants' labor-market integration process.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Transnational and Local Co-ethnic Social Ties as Coping Mechanisms Against Perceived Discrimination - A Study on the Life Satisfaction of Turkish and Moroccan Minorities in the Netherlands

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Perceived ethnic discrimination is known to decrease minorities' life satisfaction. This research investigates the extent to which minorities' local and transnational co-ethnic social ties mitigate the negative effects of perceived discrimination on life satisfaction. Put differently, focusing on the experiences of Turkish and Moroccan minorities, we discuss whether co-ethnic social ties, both locally and transnationally embedded, can be considered as coping mechanisms against perceived discrimination. Furthermore, we investigate whether these mechanisms work differently for first- and second-generation minorities. Using Netherlands Longitudinal Life-course Study, we reveal that perceived discrimination is positively associated with local co-ethnic social ties in Netherlands which consequently predicts higher life satisfaction for both generations. Surprisingly, we also show that only among the second generation perceived discrimination is associated with stronger transnational co-ethnic social ties, but not the first generation. Having these transnational ties however are beneficial for life satisfaction of both generations. Consequently, we highlight the importance of recognizing transnational embeddedness of minorities and studying the effects transnational co-ethnic social ties on subjective well-being outcomes especially for second-generation minorities.

Keywords: perceived discrimination, coping mechanisms, transnational co-ethnic social ties, local co-ethnic social ties, the Netherlands, life satisfaction

INTRODUCTION

Ethnic minority groups face discrimination in many European countries (Eurobarometer, 2019). As reported by the Netherlands Institute for Social Research, ethnic origin is an important determinant of perceived discrimination in the Netherlands (Andriessen et al., 2020). Perceived discrimination refers to feelings of adverse and unequal treatment in intergroup interactions due to characteristics such as age, gender, and ethnicity (Alanya et al., 2017). Perceiving discrimination based on ethnic origin negatively affects minorities' psychological well-being in general (Schmitt et al., 2014; Sirin et al., 2015) and their life satisfaction in particular (Verkuyten, 2008). Research has shown that ethnic

minorities have lower levels of life satisfaction than native groups (Arpino and De Valk, 2018)—a difference that also remains for the second generation (Safi, 2010; De Vroome and Hooghe, 2014). This is problematic as, in addition to being a well-being outcome (Outten and Schmitt, 2015), life satisfaction also associates with higher income, better interpersonal relationships, and health conditions (Lyubomirsky et al., 2005).

There are different coping mechanisms helping individuals deal with the negative impacts of discrimination on their well-being (Brittian et al., 2013; Kuo, 2014), such as increased identification with one's in-group (Branscombe et al., 1999), positive reappraisal, or seeking social support (Tandon et al., 2013). As suggested by Cohen (2004), social support increases the ability to deal with stressful experiences—meaning that, in addition to being a coping strategy in itself, social support can enable or strengthen other types of coping strategies. This article, therefore, focuses on social support as a coping mechanism to mitigate the harmful effects of perceived discrimination on minorities' life satisfaction. Namely, we investigate how transnational co-ethnic social ties with origin country and local co-ethnic social ties in the destination country suppress the negative effects of perceived discrimination on life satisfaction among both first- and second-generation Turkish and Moroccan minorities in the Netherlands. We define co-ethnic social ties as contacts between people belonging to the same ethnic group.

Prior research focusing on ethnic minorities' social ties has often examined the ties with the host society—taking them as an indicator of integration into the destination country (e.g. Vervoort and Dagevos, 2011). The much smaller number of studies referring to co-ethnic ties is usually limited to local ones located in the destination country. Research on local co-ethnic social ties in the destination country assumes that geographical location is a critical determinant to provide more direct social support (McPherson et al., 2001; Jasinskaja-Lahti et al., 2006).These studies often study how minorities' increased affiliations with their co-ethnics relate to their perceived prejudices or discrimination in the destination country, (e.g. Branscombe et al., 1999; Verkuyten and Yildiz, 2007). Social ties with co-ethnics in the destination country are considered, therefore, a crucial part of minorities' lives, particularly when they face discrimination and exclusion.

Additionally, the growing body of transnationalism research highlights the importance of transnational co-ethnic social ties of minorities with their friends and families in origin countries (Basch et al., 1994; Faist, 2006; Levitt et al., 2006; Bilgili 2014a, 2014b) as well as the importance of these ties for minorities' well-being (for a recent review: Horn and Fokkema, 2020). In today's world, advanced technologies in communication, (e.g. video calling) and transportation enable immigrants to have closer ties and frequent connections with their social networks wherever they are located (Levitt et al., 2006). Therefore, it is important to consider also transnational co-ethnic social ties of minorities, particularly when they face adversity, (e.g. discrimination) in the destination country since these ties can provide them with social support.

Research on coping mechanisms is yet to simultaneously consider social ties that are both locally and transnationally located. By addressing this gap in the literature, we aim to provide a more elaborated and nuanced analysis of minorities' co-ethnic social ties as coping mechanisms. Furthermore, even though the limited literature on transnational ties showed its importance as a mitigating factor against adversity (see Murphy and Mahalingam, 2004; Snel et al., 2016), less is known about the experiences of the second generation (Åkesson, 2011). This is an important gap as the second generation often has the social skills (e.g., language) and the connections with the origin country of their parents (e.g., via relatives), making transnational ties highly relevant also for them (Levitt, 2009). Furthermore, prior research shows that the second generation is often more aware of discrimination against their ethnic group than the first generation, for instance, due to their more frequent contact with the natives (Heath, 2014). These make it critical to understand how perceived discrimination relates to transnational ties of the second generation. Against this backdrop, we study the relationship between perceived discrimination, (transnational) co-ethnic social ties, and life satisfaction in the Netherlands. By comparing the relevance of these social ties for first- and second-generation minorities in the face of perceived adversity in the destination country, this study extends the literature on transnationalism among the second generation for whom the ontological (in)security of "being from here and there" poses unique challenges as well as opportunities.

Using the Netherlands Longitudinal Life Course Study (NELLS), this article focuses on first- and second-generation Turkish and Moroccan minorities in the Netherlands. It is interesting to study the experiences of these groups as they constitute the two largest non-western groups in the Netherlands (CBS, 2019). Both groups initially migrated to the Netherlands as labour immigrants in the 1960 and 1970s, followed by family migration (Van Londen et al., 2007). As two groups with predominantly Muslim backgrounds, not only their ethnic but also their religious identity plays a role in their perceptions of high levels of discrimination in the Netherlands (Andriessen et al., 2020). Recent data also showed that these perceptions of discrimination are, to a large extent, also part of the lives of the second generation (CBS, 2016; ECRI, 2019; Andriessen et al., 2020).

Perceived Discrimination, Co-Ethnic Social Ties and Life Satisfaction

Minorities utilize their co-ethnic social ties to receive social support—support that provides them a sense of stability, predictability, and recognition of their self-worth (Cohen and Wills, 1985; Tegegne and Glanville, 2018). When faced with discrimination in the destination country, minorities may feel excluded from the majority group and turn more towards their ethnic group for such support. Building on the well-known Social Identity Theory (SIT) (Tajfel and Turner, 1986), the Rejection-Identification Model (RIM) argues that feelings of threat towards

one's ingroup, (e.g. discrimination) can strengthen individuals' identification with their ingroup and, relatedly, increase their social relationships with their co-ethnics (Branscombe et al., 1999; Ashmore et al., 2004, pg. 92)[1]. This increased social embeddedness with their co-ethnic can help minorities improve their well-being (Branscombe et al., 1999).

Following this argument, we argue that perceiving discrimination based on ethnicity encourages minorities to build social ties with their co-ethnics to seek support. In this regard, perceived discrimination and co-ethnic ties are not independent, but related to each other. Prior research on coping mechanisms has often examined how minorities utilize their existing co-ethnic ties to help them deal with the adverse consequences of discrimination on their well-being (Sellers and Shelton, 2003; Jasinskaja-Lahti et al., 2006). Adding to this rich strand of research, we aim to study how feeling discriminated against could motivate minorities to turn to their co-ethnics for social connections. This could not only mean strengthening existing co-ethnic social ties but also building new co-ethnic ties to seek support.

The social capital perspective provides a further explanation for the function of social ties as providing social support, particularly when individuals face adverse conditions in society. Putnam (2000) refers to bonding social capital to define social engagement between people belonging to the same social group. This type of capital can provide emotional support and protect self-rated health (Beaudoin, 2009; Tegegne and Glanville, 2018). Following this, Turkish and Moroccan minorities could invest more intensely in their bonding social capital with their co-ethnics to improve their subjective well-being when faced with discrimination or hostility in the destination country.

Transnational Co-Ethnic Social Ties

In addition to the theoretical mechanisms provided above, we specifically discuss the relationship between perceived discrimination and transnational co-ethnic social ties with the reactive transnationalism argument. Namely, Itzigsohn and Saucedo (2002) argue that negative experiences, such as discrimination, can increase immigrants' transnational activities as a reaction. This type of transnationalism can function as an escape from the rejection felt in the destination country and can be compensatory for the social exclusion (Castañeda et al., 2014). Moreover, as research on new communication technologies (e.g. via the Internet) has demonstrated, the modern pattern of technologies does not just substitute face-to-face communication but creates new resources and constructs a new kind of connected presence (Licoppe and Smoreda, 2005). Therefore, transnational social ties with origin country can function as a source of social support that minorities invest in when they feel hostility in the destination country.

As Snel et al. (2016) indicate there is only a handful of studies focusing on reactive transnationalism compared to studies on other consequences of perceived discrimination, (e.g. increased affiliations with one's co-ethnic group (Branscombe et al., 1999)). For example, in their study conducted in the Dutch context among middle-class immigrants living in Rotterdam, Snel et al. (2016) found that perceiving discrimination based on their ethnicity associates positively with immigrants' having more transnational social ties. Some qualitative studies conducted among different minority groups in the United Kingdom context also provided similar results regarding minorities' increased transnational activities when faced with discrimination (Redclift and Rajina, 2019; Pourmedhi, 2020). Therefore, we hypothesize that *Turkish and Moroccan minorities' perceptions of discrimination in the Netherlands associate positively with their transnational co-ethnic social ties* (H1).

Research on transnationalism has been conducted mostly among first-generation minorities (Castañeda et al., 2014; Bilgili, 2014a, 2014b). However, reactive transnationalism could also be relevant for the second generation, especially considering the relatively high levels of discrimination they perceive (Heath, 2014; Andriessen et al., 2020). As Levitt (2009) explains, when second-generation minorities grow up in households influenced by their families' origin countries, they also socialize into the norms and values of this culture and form social ties across borders. Many second-generation minorities, therefore, have the social skills, (e.g. language skills) and resources, (e.g. via relatives) to form transnational social ties (Levitt, 2009).

Despite their relevance for the lives of the second generation, the extent to which the second generation engages with transnational ties could be lower than the first generation due to two reasons. Firstly, having spent a larger part of their lives in the origin country, the first generation may have stronger interpersonal ties with their friends and relatives living there. In contrast, the second generation may develop these connections indirectly often via their parents or during short visits to the origin country which may lower the intensity and closeness of these ties. Secondly, the skills and resources of the second generation to build transnational ties may be weaker than those of the first generation. For instance, even though second-generation minorities may have some knowledge of the origin-country language, often their proficiency remains lower than the first generation. Accordingly, while transnational ties are still part of the lives of the second generation, both quantitative and qualitative studies have demonstrated that the extent and frequency of transnational social ties may be lower for the second compared to the first generation (Viruell-Fuentes, 2006; Wessendorf, 2016). Furthermore, as Beauchemin et al. (2011) show perceiving discrimination was one of the main factors encouraging second-generation minorities from France to form transnational social ties. We hypothesize that perceived discrimination associates positively with transnational co-ethnic social ties also for the second-generation Turkish and Moroccan

[1]The present article refers to the literature on strong group identity as a coping mechanism against negative effects of perceiving discrimination. It is, however, important to acknowledge that strong ethnic identity can also function as a risk factor and increase ethnic minorities' perceptions of discrimination, (e.g. Sellers and Shelton, 2003).

minorities although the strength of this association for the second generation is weaker than for the first-generation (H2).

Prior research suggests that transnational social ties with family and friends may have both positive and negative impacts on the subjective well-being and mental health of ethnic minorities (Torres et al., 2016; Horn and Fokkema, 2020). On the one hand, transnational social ties can be a stress factor as they may induce feelings of social obligation and emotions of separation. On the other hand, since these are ties transcending national boundaries, they can facilitate minorities' belonging within a broader family which makes minorities feel understood, valued and cared for by others,—which could, in turn, increase their well-being (Torres, 2013). Furthermore, through these types of social ties, minorities can compare their quality of life in the destination country with their family and friends abroad. Particularly in the context of migration from economically less developed to more developed countries, these comparisons may be positive giving a better sense of well-being to minorities (Alcántara et al., 2014; Torres et al., 2016). Nieswand (2011) also argues that they may develop an awareness of their privileged socio-economic situation compared to those left-behind. In line with these arguments, research conducted among Caribbean immigrants has shown that transnational social ties with origin countries are positively related to immigrants' life satisfaction (Murphy and Mahalingam, 2004). While recognizing potential stress factors related to transnational social ties, following these results, we hypothesize that *increased transnational co-ethnic social ties of Turkish and Moroccan minorities in their origin countries associate positively with their life satisfaction* (H3). The theoretical model can be seen in **Figure 1**.

Local Co-Ethnic Social Ties

As local sources that are geographically proximate to ethnic minorities, local co-ethnic social ties in the destination country are vital elements in providing social support against loneliness and isolation and mainly to give first-hand support (Ryan, 2007; Ryan et al., 2008). Therefore, when ethnic minorities perceive themselves as being discriminated against, they can immediately turn to their co-ethnics in the destination country to receive support. Building on this literature, we hypothesize that *perceived discrimination of Turkish and Moroccan minorities in the Netherlands associate positively with their local co-ethnic social ties in the destination country* (H4). As both first- and second-generation minorities live in the destination country, the extent of their skills and opportunities to build local co-ethnic social ties are more similar than those to build transnational ones. We, therefore, do not expect generation differences regarding local co-ethnic social ties.

In the lives of ethnic minorities, having social ties with their co-ethnics who have similar experiences may have various supportive roles. The social support provided by people who have similar experiences could be useful since it can lead minorities to feel "empathetic understanding" which is important in coping with negative experiences (Thoits, 1986). This type of understanding could give them the feeling that their experiences and emotions are understood by people who perceive similar difficulties. Furthermore, local co-ethnic social ties could give minorities the chance to observe their co-ethnics reactions when they face a similar disadvantaged situation in the destination country. Seeing people who have coped with similar difficulties can help individuals develop active coping behaviours, reduce stress, and manage their emotional reactions (Thoits, 2011). Consequently, we hypothesize that *increased local co-ethnic social ties of Turkish and Moroccan minorities in the Netherlands relate positively to their life satisfaction* (H5).

Data and Methods

Data and Participants

This study used data from the first wave of the Netherlands Longitudinal Life Course Study (NELLS) (De Graaf et al., 2010a). As the questions on minorities' transnational co-ethnic social ties were only in this wave, we used this wave of the data. NELLS was designed as a panel survey for sociological themes, mainly related to social cohesion, norms, values, and inequality (De Graaf et al., 2010b). This survey targeted people aged 15–45 and applied a two-stage stratified sampling procedure. Firstly, 35 municipalities (including 256 neighbourhoods) were randomly selected by region and urbanization. Later on, respondents were randomly chosen based on their age and ethnic origins from these municipalities. There was an initial sample of 5,312. Respondents from Turkish and Moroccan minority groups were oversampled. The data were collected using both face-to-face and self-completion methods. The data included a small sample of missing values (7.7%) due to the self-completion part. We excluded these missing values as some of our questions came from this part of the survey. Furthermore, due to the focus of our article, we only chose respondents from Turkish and Moroccan minority groups, which resulted in a final sample of 2012 respondents. This sample included 646 first-generation, 358 second-generation Turkish minorities, and 638 first-generation, 370 second-generation Moroccan minorities.

Measures

In the present study, the *dependent variable* was life satisfaction. This measure was constructed as a reflective latent variable composed of four statements. These statements were "my life is for most parts ideal," "my living conditions are excellent," "overall, I am content with my life" and "the most important things I expect from life I achieved so far." They had five answer categories ranging from "strongly agree" to "strongly disagree." All the items were reverse coded before constructing the latent variable so that a higher score indicated higher life satisfaction. The resulting latent variable was found reliable for the whole sample and for the sub-groups according to ethnic groups and generations.[2]

The *independent variable* of the study was perceived discrimination. To measure this, we constructed a formative

[2]Composite reliability for the full sample: rho = 0.852; for first-generation Turkish minorities: rho = 0.857; for second-generation Turkish minorities: rho = 0.834; for first-generation Moroccan minorities: rho = 0.875; for second-generation Moroccan minorities: rho = 0.802.

latent variable by taking the average of the questions asking respondents if they ever felt discriminated on the basis of their ethnic origin at work, school, in class, on the street, in public transport, associations, clubs, sports and at nightlife separately. These questions had the answer categories of "never," "yes, only once," "yes, often." A higher score indicated higher levels of perceived discrimination.

The *first mediator* was transnational co-ethnic social ties with origin country. It was also constructed as a formative latent variables with the questions of "How often have you visited the country of origin of your parents in the last 12 months?" and "How often have you had contact via phone or email with family or friends in that country in the last 12 months?" These questions had the answer categories of "yes, several times," "yes, once in a while" and "no." They were reverse coded so that a higher score on this variable indicated more frequent transnational co-ethnic social ties with the origin country.

The *second mediator* was local co-ethnic social ties in the destination country. It was taken as a formative latent variable composed of the questions on how often respondents have contacts with their co-ethnics in the neighbourhood, at work/school and in leisure clubs in the Netherlands. The questions had answer categories ranging from 1 ("every day") to 7 ("never") which were reverse-coded so that a higher score showed more frequent contact with co-ethnics in the Netherlands.

Ethnicity and generation were used as *grouping variables* in multi-group analyses, comparing first and second generations from Turkish and Moroccan minority groups. Following the definition of ethnicity and generation of Statistics the Netherlands (CBS 2016), ethnicity was classified based on the countries of birth of the respondents and both their parents. Accordingly, if the person and one or two parents were born outside the Netherlands, the respondent was classified as "first generation" whereas if the person was born in the Netherlands while one or two parents were not, that person was taken as "second generation" (De Graaf et al., 2010b).

Literature shows that perceptions of discrimination and involvement in transnational practices show differences between gender groups (Itzigsohn and Saucedo, 2002; Alanya et al., 2017). Furthermore, financial situation relates to the capacity to engage in transnational activities (Snel et al., 2016). Additionally, ethnic minorities' social ties could be related to their Dutch language skills (Martinovic et al., 2008) and the share of co-ethnics in the neighbourhood (Huijts et al., 2014). Following this prior research, we controlled for the effects of age, gender (1 = "Female", 0 = "Male"), being employed (1 = "Yes", 0 = "No"), Dutch language proficiency (from 1 = "None" to 5 = "Very good"), educational attainment, financial difficulties, and share of co-ethnics in the neighbourhood (in percentages). While constructing the variable of educational attainment variable, for those who are still in education, we took their current level of education, whereas, for those who have left education, we took their highest level of education attainment (1 = "low education"–6 = "tertiary education"). The variable of financial difficulties was a scale variable (0–1) constructed by taking the average of five questions such as "in the last 3 months, whether you have had difficulties making ends meet." Higher scores on this measure indicated having more financial difficulties.

Analyses

All the missing values -around 5 %- were handled using full information maximum likelihood (FIML) method in Mplus. We constructed most variables as formative latent variables since respondents who scored high on different items within this latent variable should also score high on this latent variable even if these items were not correlated with each other. One of the aims of this study was to compare the path from perceived discrimination to transnational co-ethnic social ties for first- and second-generation Turkish and Moroccan minorities. We, therefore, conducted a moderated mediation analysis. We did so by conducting a multi-group structural equation modelling for the groups of first- and second-generation Turkish and Moroccan minorities.

Since the present study contained one reflective latent variable -life satisfaction-, measurement invariance across these four groups was performed. Later on, structural invariance tests were performed in order to obtain a final structural model that enables testing mediation paths for different groups in the analysis. As our model was complicated enough with reflective and formative latent variables, the complex survey method was chosen in order to take the nested structure of the data into consideration (see Asparouhov and Muthen, 2006).

RESULTS

Measurement Model

In the present analysis, one reflective latent variable was constructed to measure "life satisfaction." Measurement invariance tests showed that this latent variable had a comparable fit across the ethnic groups and generations in the analysis (see **Tables 1**, **2**). For the formative latent variables in the analysis, equality of weights of indicators for each of these variables was assumed across the groups.

Structural Model

We performed structural invariance tests to obtain a well-fitting structural model allowing us to test our hypotheses across the ethnic and generation groups in our study. These tests showed that a partially constrained model had a reasonably good fit comparable to that of an unconstrained model (see **Table 3**). We reached this partially constrained model by allowing the path from "transnational co-ethnic social ties" to "perceived discrimination" to vary across the generation groups—but not across ethnic groups -, in line with our hypothesis on generational differences. This model, therefore, allowed us to keep this specific mediation path comparable across the ethnic groups but not across the generations. As a result, in the partially constrained model, the mediation paths were statistically comparable between

TABLE 1 | Measurement invariance test for CFA (1) for "life satisfaction" with four items across ethnic minority groups and generations (N = 2012).

Invariance	SB-Chi2 (df)	RMSEA	CFI	TLI	SRMR	SB- Chi2 (df), (p)
Configural	23.443 (8) **	0.062	0.994	0.981	0.012	–
Metric	29.667 (17) *	0.039	0.995	0.993	0.040	7.0826 (9), p = 0.629
Scalar	44.951 (26) *	0.038	0.992	0.993	0.046	20.9693 (18), p = 0.2810

*Note: SB stands for Satorra-Bentler Chi-square difference test. *p < 0.05; **p < 0.01 (two-tailed).*

TABLE 2 | Unstandardized factor loadings of the latent factor of "life satisfaction."

Items	Factor loadings
1. My life is for most parts ideal	1
2. My living conditions are excellent	1.053***
3. Overall, I am content with my life	0.914***
4. The most important things I expect from life I achieved so far	0.963***

***p < 0.001 (two-tailed).*

TABLE 3 | Structural invariance test between 1st generation Turkish minority (n = 624), 2nd generation Turkish minority (n = 350), 1st generation Moroccan minority (n = 620) and 2nd generation Moroccan minority (n = 351) (N = 2012).

	SB-Chi2 (df)	RMSEA	CFI	TLI	SRMR	SB Chi2 difference, (df
Unconstrained	222.828 (146) **	0.032	0.982	0.969	0.023	–
Constrained	249.660 (161) ***	0.033	0.979	0.968	0.027	28.8608 (15), p = 0.030
Partially constrained	240.731 (160) **	0.032	0.981	0.971	0.026	17.9429 (14), p = 0.209

*Notes: In partially constrained model, the path from "perceived discrimination" to "origin-country co-ethnic social ties" were let to vary across generations, but constrained to be the same across ethnic groups within generations. **p < 0.05, ***p < 0.001 (two-tailed).*

TABLE 4 | Descriptive statistics of all variables in the analyses [1st generation Turkish minority (n = 646), 2nd generation Turkish minority (n = 358), 1st generation Moroccan minority (n = 638), 2nd generation Moroccan minority (n = 370)].

	Range	Mean (SD)			
		1st gen Turkish minority	2nd gen Turkish minority	1st gen moroccan minority	2nd gen moroccan minority
Dependent variable					
Life satisfaction	1–5	3.55 (0.76)[a]	3.67 (0.69)[b]	3.62 (0.80)[a]	3.78 (0.68)[b]
Independent variable					
Perceived discrimination	1–3	1.34 (0.41)[a]	1.30 (0.38)[a]	1.32 (0.39)[a]	1.42 (0.44)[b]
Mediators					
Transnational ties	1–3	2.24 (0.56)[a]	2.22 (0.62)[a]	2.18 (0.56)[a]	2.15 (0.63)[a]
Local ties	1–7	4.53 (1.60)[a]	4.82 (1.59)[b]	4.26 (1.56)[c]	4.96 (1.67)[b]
Control variables					
Age	14–49	35.57 (7.51)	24.70 (7.48)	34.40 (6.94)	22.98 (6.58)
Female	0/1	0.49	0.55	0.54	0.56
Dutch Language proficiency	1–5	3.80 (1.05)	4.62 (0.64)	4.04 (1.01)	4.84 (0.39)
Education	1–6	2.79 (1.68)	3.27 (1.36)	2.74 (1.63)	3.43 (1.29)
Financial difficulties	0–1	0.23 (0.29)	0.18 (0.26)	0.23 (0.28)	0.13 (0.22)
Employment	0/1	0.64	0.59	0.60	0.60
Share of co-ethnic neighbors	1–31	7.28 (6.91)	7.49 (6.47)	9.47 (7.24)	9.03 (7.32)

Notes: For mean values with the same superscript in each row shows that mean values for those groups are not statistically significantly different from each other. In order to conduct the post-hoc test of one-way ANOVA, the mediators–transnational and local ties- and dependent variable–life satisfaction- (which is originally a reflexive latent variable) were taken as an average variable and the mean values were reported from SPSS based on this construction for these variables. Standard deviations are not reported for dichotomous variables.

Turkish and Moroccan minority groups and between the first and second generations, except for the generational difference for the path from "transnational co-ethnic social ties" to "perceived discrimination." As the partially constrained model is more parsimonious, this model was taken as the final model to test our hypotheses.

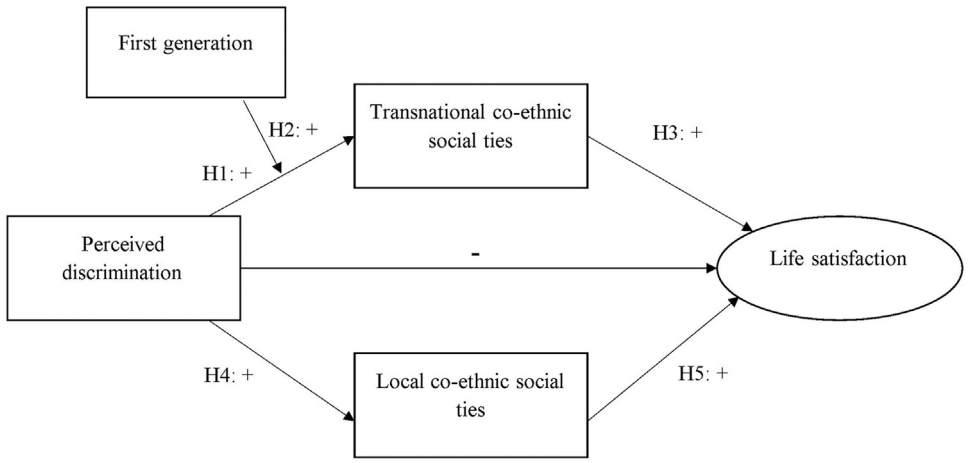

FIGURE 1 | Theoretical model. Control variables: Age, gender, employment, Dutch language skills, education, financial difficulties, share of co-ethnic neighbours.

Descriptive Results

Descriptive results are presented in **Table 4**. The second generation reported having higher life satisfaction than the first generation, for both Turkish and Moroccan ethnic groups ($F(3, 2008) = 8.260$, $p < 0.001$). Nevertheless, for each group, the levels of life satisfaction were significantly above the midpoint of scale (see **Supplementary Table S1**). This meant that, on average, the respondents defined their satisfaction with life positively, although not indicating that they were completely satisfied. For perceived discrimination, second-generation Moroccan minorities had the highest average, meaning that they perceived it the most ($F(3, 1961) = 6.171$, $p < 0.001$). However, the means of all the groups for this variable were significantly below the midpoint of the scale, indicating that most respondents did not perceive discrimination to a large extent (see **Supplementary Table S1**; **Supplementary Appendix**). Accordingly, 36 percent of the respondents from all groups said that they have never perceived discrimination.

Regarding transnational co-ethnic social ties, there was no significant difference between the groups ($F(3, 1964) = 2.397$, $p = 0.07$). For both ethnic groups and generations, the mean values were slightly higher than the midpoint of the scale. This meant that, on average, respondents had relatively frequent social ties with their origin countries. For local co-ethnic social ties, the second generation from both ethnic groups had more frequent contacts with their co-ethnics in the Netherlands compared to the first generation ($F(3, 2002) = 18.186$, $p < 0.001$). Among the first generation, the Turkish group had more frequent local ties than the Moroccan group. For all the groups, the mean values were significantly and slightly above the midpoint of the scale. This indicated that most respondents had contact with their co-ethnics more than once a month.

Main Results

The results of the partially constrained model are presented in **Figure 2** (also see **Supplementary Tables S2, S3** in **Supplementary Appendix**). These results showed that perceiving ethnic-based discrimination had a negatively direct association with minorities' life satisfaction. In line with the first hypothesis, for second-generation Turkish and Moroccan minorities, perceived discrimination is associated positively with their transnational co-ethnic social ties. However, this was not the case for the first generation as the path from transnational ties to perceived discrimination was not statistically significant for this group. The first hypothesis, therefore, was partially supported. With the second hypothesis, we expected the association between perceived discrimination and transnational ties to be stronger for the first generation than the second generation. Wald tests showed that the coefficients for this path indeed differed from each other for the two generations (Wald Chi2 (1) = 11.757, $p < 0.0001$). The fact that this path was not statistically significant for the first generation, while it was for the second generation, could mean that there was a stronger association between perceived discrimination and transnational social ties for the second than for the first generation. Therefore, we rejected our second hypothesis.

In line with our third hypothesis, increased transnational co-ethnic social ties of Turkish and Moroccan minorities associated positively with their life satisfaction for both generations. Despite the statistically significant path from transnational social ties to life satisfaction, the indirect effect of perceived discrimination on life satisfaction via these ties was not statistically significant for the first generation ($b = -0.001$, $p = 0.831$) while it was for the second generation ($b = 0.023$, $p = 0.005$).

Regarding the role of local co-ethnic social ties, we found support for our fourth hypothesis predicting that perceived discrimination associates positively with local co-ethnic social ties in the destination country. The analysis yielded a positive association between perceiving discrimination and having local co-ethnic social ties. With the fifth hypothesis, we further expected increased local co-ethnic social ties to associate positively with their life satisfaction. This hypothesis was also supported by the analysis. As a result, the indirect effect of perceived discrimination on life satisfaction was statistically

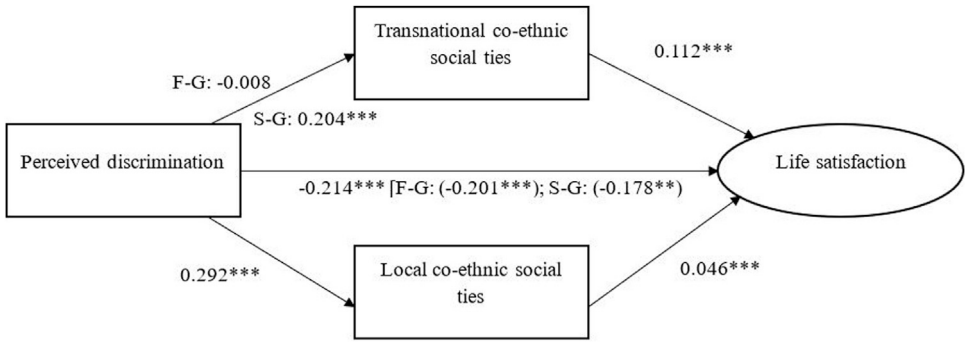

FIGURE 2 | Path diagram of directing and meditating first and second generation Turkish Morrocon Minorities. Note: F-G and S-G are stands for first and second generation respectievly. Total effect are reported for two groups in the parenthesis.Reflective latent variables are represent in the circle $^{**}p < 0.01$,$^{***}p < 0.001$(two tailed).

significant (b = 0.013 p = 0.002). This meant that perceived discrimination was associated with minorities' increased social ties with their co-ethnics in the Netherlands. And that these ties, in turn, were beneficial for their life satisfaction.

DISCUSSION

Ethnic origin is one of the main determinants of perceived discrimination in the Netherlands (Andriessen et al., 2020). Research has demonstrated that perceptions of discrimination negatively relate to minorities' life satisfaction (Verkuyten, 2008). Building on this research, in this article, we aimed to analyse the extent to which minorities utilize their co-ethnic social ties in different geographical locations to mitigate the negative effects of perceived discrimination on their life satisfaction. We focused on Turkish and Moroccan minorities in the Netherlands. As the largest non-western groups in the Netherlands, both groups have disadvantaged socio-economic status in the Netherlands and perceive relatively high levels of discrimination which also applies to the second generation to a large extent (CBS, 2016; ECRI, 2019; Andriessen et al., 2020).

By focusing on minorities' co-ethnic social ties located in different countries simultaneously, we presented a more elaborate investigation of how these social ties suppress the negative effects of perceived discrimination on life satisfaction. Moreover, we compared first- and second-generation minorities based on how they utilize their transnational co-ethnic social ties in the face of adversity in the destination country. Finally, this study brought together varying strands of literature on transnationalism, perceived discrimination, and psychological well-being to understand better the experiences of Turkish and Moroccan minorities in the Netherlands.

In line with previous literature, we found that perceived discrimination was negatively related to the life satisfaction of Turkish and Moroccan minorities in the Netherlands (e.g. Schmitt et al., 2003)—though we should note that our respondents perceived, on average, relatively low discrimination. Furthermore, we showed that both generations had rather frequent transnational social ties with their origin countries. Perceived discrimination, however, was positively related to having transnational ties only for the second generation. As Levitt (2009) argues, second-generation minorities often grow up in households with ideological, material, or affective connections to the origin country. They, therefore, have the social skills to engage with the origin country. In line with reactive transnationalism (Itzigsohn and Saucedo, 2002), our findings showed that negative contexts, such as discrimination, in the destination country could motivate the second generation to use these social skills to form more transnational social ties, (e.g. Portes and Rumbaut, 2001; Fokkema et al., 2012). This way, they could feel more social support in their lives. The absence of the relation between perceiving discrimination and forming transnational ties for the first generation could be due to the first generation minorities having ties with their origin countries mainly because they lived there (Beauchemin et al., 2011). Hence, for the first generation, having these transnational ties might not be driven primarily by their (negative) experiences in the destination country.

For both generations, having more transnational co-ethnic social ties was, in turn, related to higher levels of life satisfaction. This result supports the benefits of having these ties for psychological well-being, (e.g. Torres, 2013). Hence, our findings indicate that while having social ties with their origin countries is positively associated with the life satisfaction of both generations, it functions as a coping mechanism only for second-generation Turkish and Moroccan minorities in the Netherlands.

Regarding minorities' local co-ethnic social ties in the destination country, both Turkish and Moroccan minorities had rather frequent contact with their co-ethnics living in the Netherlands. The present study demonstrates that these co-ethnic social ties could help both generations to deal with the negative influences of perceived discrimination on their psychological well-being. This finding emphasized the importance of geographically close co-ethnic ties provide social support, (e.g. Ryan, 2007). Furthermore, it showed that those who have similar negative experiences could understand the difficulties associated

with those experiences and help each other manage the negative consequences, (e.g. Thoits, 2011).

CONCLUSION

Minorities perceive discrimination based on their ethnicity in different areas of their lives (ECRI, 2019; Andriessen et al., 2020). In this article, we showed that these perceptions of discrimination have negative implications for ethnic minorities' life satisfaction. The fact that life satisfaction is an important dimension of psychological well-being makes it even more pressing to tackle the issue of continuing ethnic discrimination in many destination countries. In this regard, not only actual experiences of discrimination but also perceptions or feelings of discrimination as a reflection of these negative experiences are crucial to targeting to achieve better well-being outcomes for ethnic minorities.

As a way of tackling the negative influences of perceived discrimination on well-being, we showed the importance of minorities' transnational and local co-ethnic social ties as two channels through which the negative effects of perceived discrimination on life satisfaction are decreased. It is particularly interesting to see the role of transnational social ties as a coping mechanism, especially with regards to the second generation. Our results demonstrated that minorities utilize their transnational social ties as well as their local co-ethnic social ties while being settled in the destination country, when they face adversity in this country. This means that in the investigation of minorities' experiences in the Netherlands and their overall well-being, it is necessary to take into account their co-ethnic social ties and networks as a whole, independent of where they are located. This provides a more holistic understanding of minorities' lives which can eventually help determine the best ways to support them and increase their well-being in the face of continuing ethnic discrimination.

In short, this research aimed at contributing to the literature on coping mechanisms against perceived discrimination among ethnic minorities. Extending the literature on previously studied coping mechanisms such as problem-solving or positive reappraisal (Tandon et al., 2013), we focused on seeking social support among both locally and transnationally located co-ethnics. Despite its important findings, our research had some limitations. Firstly, our focus was only on Turkish and Moroccan minority groups in the Netherlands. These groups are large and established ethnic minority groups in the Netherlands. Future research could test the role (transnational) co-ethnic social ties among smaller and newer ethnic minority groups in other contexts. Particularly, the role of local co-ethnic social ties may be different for these groups due to the lack of a large ethnic community in the destination country. Secondly, our measures of transnational and local social ties were not comparable to each other—preventing us from comparing the extent to which minorities utilize them. And, lastly, our study had a restricted measure of transnational ties. Future research could use more comprehensive and comparable measures of locally and transnationally located co-ethnic social ties (e.g., how important people consider these ties to be). Using these measures would also ultimately contribute to methodological and operational advancements within well-being and transnational migration studies.

DATA AVAILABILITY STATEMENT

The dataset analysed during the current study is available in DANS repository, https://easy.dans.knaw.nl/ui/datasets/id/easy-dataset:34387.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

EA wrote the "Introduction," "Data and Methods," "Results" and "Discussion" sections of the paper and conducted the analyses, including the robustness checks. OB contributed to the development of the idea of the paper and gave critical feedback on every section of the paper. Furthermore, OB contributed to the revisions throughout the paper.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsoc.2021.671897/full#supplementary-material

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Corrigendum: Transnational and Local Co-ethnic Social Ties as Coping Mechanisms Against Perceived Discrimination - A Study on the Life Satisfaction of Turkish and Moroccan Minorities in the Netherlands

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A Corrigendum on

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In the original article, there was a mistake in the legend for "**Figure 1**" as published. "Not all control variables in the analyses were fully mentioned in the Figure legend." The correct legend appears below.

In the original article, the reference for "Asparouhov and Muthen, 2006" was incorrectly written as "Asparouhov, T., and Muthen, B. (2006). *Comparison of Estimation Methods for Complexsurvey Data Analysis. Mplus Web Notes*." The correct reference appears below.

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The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.

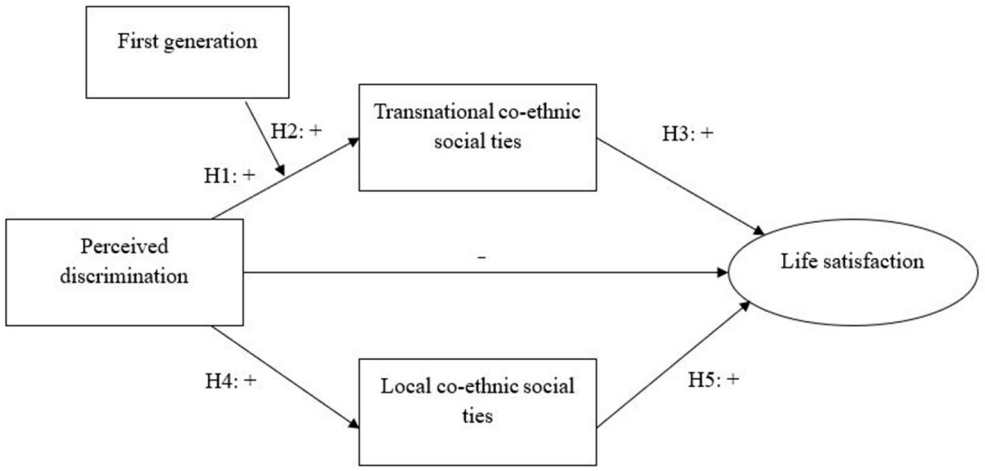

FIGURE 1 | Theoretical model. Control variables: Age, gender, employment, Dutch language skills, education, financial difficulties, share of co-ethnic neighbours.

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The Impact of Pre- and Postarrival Mechanisms on Self-rated Health and Life Satisfaction Among Refugees in Germany

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In this study, we focus on the evolution of refugees' well-being in the first years after their arrival in Germany. In contrast to other immigrants (e.g., labor migrants), refugees experience higher risks of unexpected and traumatic events and insecurity before and during their migration and face various legal and structural barriers in the receiving country. We contribute to the existing literature by exploring from a dynamic perspective possible pre- and postarrival determinants of refugees' life satisfaction and self-rated health upon arrival in Germany and the development of their life satisfaction and self-rated health in the process of becoming established. Applying linear regression and panel models with recent longitudinal data from the IAB-BAMF-SOEP Survey of Refugees in Germany, we find significant effects of prearrival factors, such as traumatic experiences and the complexity of migration, on both life satisfaction and self-rated health at the time of the first interview. Regarding postarrival factors, our results suggest that improvement in language proficiency and labor market status significantly shape refugees' life satisfaction and self-rated health. The time-dynamic analyses reveal substantial improvements in life satisfaction upon the approval of refugee status and the transition from shared housing to private accommodations. However, we find no improvements in self-rated health due to legal status but rather deterioration effects due to long-term residence in shared housing.

Keywords: refugees, self-rated health, life satisfaction, premigration stress factors, postmigration stress factors, IAB-BAMF-SOEP survey of refugees

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INTRODUCTION

The recent surge in the number of asylum applications in the EU28 member states, which received nearly 5 million first-time applications between 2014 and 2020 (Eurostat, 2021), has raised new and multiple challenges at the national and supranational levels. Germany plays a prominent role in the management of refugee[1] flows given that many of these asylum applications were submitted there (1.9 Mio of the first-time applications between 2014 and 2020; Eurostat, 2021). Compared to Germany's previous experience of receiving large inflows of refugees in the early 1990s, the current

[1]With the use of the term "refugee," we refer to individuals who seek asylum outside their countries of origin or any other form of protection, irrespective of their legal status (Brücker et al., 2020, 26).

situation is different in its scale, in part because many recent refugees originate from countries with a limited return perspective, at least in the short term (Degler and Liebig, 2017; Brücker et al., 2020).

Refugees are different from other categories of immigrants because of their traumatic experience (both at home and during migration) and their "forced" decision to migrate (Chiswick et al., 2008; Chin and Cortes, 2015; FitzGerald and Arar, 2018; Kogan and Kalter, 2020). They usually come from destabilized countries, typically affected by wars or war-like situations and human rights violations (UNHCR, 2020). Many refugees take life-threatening routes to arrive at safer destinations. For instance, approximately one-quarter of the recent refugees who arrived in Germany reported shipwrecks, two-fifth reported physical assaults, and 15 percent of female refugees reported sexual assaults (Brücker et al., 2016). After arriving at the destination country, refugees often live under precarious conditions (Robjant et al., 2009; Nickerson et al., 2010); are worried about family members remaining in countries of origin or other transition countries (Nickerson et al., 2010; Löbel and Jacobsen, 2021); have to go through lengthy and, in many cases, stressful asylum procedures; (Silove et al., 1998; Laban et al., 2004; Kosyakova and Brenzel, 2020; Kosyakova and Brücker, 2020), and face restrictions to healthcare services (Silove et al., 1999; Norredam et al., 2006; Chase et al., 2017; Jaschke and Kosyakova, 2021). It has also been argued that – compared to economic immigrants – refugees are less oriented towards the labor market in their migration decision and, hence, are less likely to be positively selected based on health (Chiswick et al., 2008). All of these factors make refugees particularly vulnerable in regard to their health situations: previous studies have found that up to 30 percent of adult refugees suffer from health impairments (Fazel et al., 2005; Robjant et al., 2009; Bakker et al., 2014; Giua, 2017). It is, therefore, not surprising that some scholars have termed the situation of refugees in Germany as a mental health crisis (Schauer, 2016; Hajak et al., 2021).

Given that health status and overall life satisfaction form an important basis for successful and sustainable integration into the economy (Chatterji et al., 2011) and society (Steptoe et al., 2015) of the destination country, it is not surprising that refugees' integration processes are slower than those of other categories of immigrants (Chiswick et al., 2008; Brücker et al., 2019; Brell et al., 2019). These disadvantages seem to be boosted by additional postmigration stress, such as the length of the procedure to achieve refugee status, different regulations for access to the labor market according to the regulations of the host country, high human capital but difficulties obtaining recognition for their educational degrees and previous work experiences, and lack of knowledge of the host country language (Jacobsen, 2019; Arendt et al., 2020; Kogan and Kalter, 2020; Kosyakova and Brenzel, 2020).

While previous research has focused on refugees' psychological distress and the prevalence of depression and anxiety symptoms (for meta-analyses and review, *see*, e.g., Fazel et al., 2005; Porter and Haslam, 2005; Lindert et al., 2009; Steel et al., 2009), the self-rated health status and life satisfaction of refugees have been less often addressed by quantitative studies. We contribute to the existing literature by *1*) exploring pre- and postarrival mechanisms affecting refugees' self-rated health status and life satisfaction upon their arrival in Germany and *2*) the development of their self-rated health and life satisfaction as they become established in Germany. In the social sciences, both self-rated health status and life satisfaction have been shown to effectively predict the risk of mortality (*see* Idler and Benyamini, 2006 for a review), and the examination of these measures has become a conventional way to address the health status of the population of interest (Frijters et al., 2005; Jones and Schurer, 2011; Schmitz, 2011).[2] These measures reflect slightly different aspects of subjectively perceived health situations and may provide a more comprehensive view of an individual's overall health status since they link both mental and physical health status.

Using longitudinal data from the IAB-BAMF-SOEP Survey of Refugees in Germany (Brücker et al., 2017) from 2016 to 2019, we study the impact of pre- and postarrival stress factors on the development of self-rated health status and the overall life satisfaction of refugees. We focus on four main groups of refugees arriving in Germany in approximately 2015, namely, refugees from Syria, Iraq, Afghanistan and Eritrea. Including variables beyond sociodemographic individual characteristics such as age, education, social background and gender, the richness of our dataset allows us to account for a variety of pre- and postarrival factors[3] to address the causes and processes of refugee migration. Adopting a dynamic perspective, our research agenda follows three major questions: *1*) To what extent do different prearrival factors (reasons to migrate, complexity of the migration move, financing of migration and traumatic experiences) affect refugees' self-rated health and life satisfaction? *2*) What is the contribution of postmigration experiences to refugees' self-rated health and life satisfaction? *3*) How are changes in refugees' self-rated health status and life satisfaction shaped by different postarrival experiences?

The handful of studies examining the health status of recent refugees in Germany (Dietrich et al., 2019; Walther et al., 2020; Jaschke and Kosyakova, 2021; Löbel and Jacobsen, 2021) have focused primarily on access to healthcare services and the role of family ties abroad, as well as the role of pre- and postarrival stress for psychological and physical health and psychological distress (*see* meta-analysis by Hajak et al., 2021). These studies, however, mainly focused on the level differences while neglecting the role of the postarrival experiences for the development of health outcomes over the duration of the stay. The theoretical strength of our study is that we test various mechanisms of pre- and post-migration strengths not only from static but also from a dynamic perspective.

[2]There is, however, some criticism of this approach in the literature due to the differences in the self-rated assessment of health across cultures (Jylha et al., 1998) and differences in reference points (Ubel et al., 2003).

[3]In response to the complexity of many recent refugees' escape paths, we combine pre- and perimigration stressors (Walther et al., 2020) as prearrival factors and contrast them with postarrival factors. Due to the structure of our data, prearrival information was collected at the first interview and thus was already partially overshadowed by early postarrival experiences, including approval of the legal status of refugees in Germany, for a subgroup of respondents.

THEORETICAL BACKGROUND

Self-rated Health Status and Life Satisfaction Among Immigrants and Refugees

In the literature on refugees, most studies address well-being by measuring psychopathology, while positive and subjective dimensions of well-being have received significantly less attention (Tozer et al., 2018). Positive well-being is different from mental health, and it accounts for distinct or supplementary conditions considered necessary for an individual to flourish (Keyes, 2007). The subjective components of well-being are receiving growing attention owing to the increasing awareness of the limits of objective indicators in evaluating individual and societal well-being (*see*, e.g., Stiglitz et al., 2009; Bache, 2019). While economists, psychologists and sociologists have studied the determinants of happiness, migration scholars have yet to fully recognize the importance of studying immigrants' subjective well-being (Wright, 2011; Hendriks and Bartram, 2019). In this study, we address this gap by focusing on two different dimensions of well-being, namely, self-rated health status and overall life satisfaction. In contrast to most of the literature taking a descriptive approach, this paper applies a mechanism-based approach of causal explanation.

Subjective well-being can be used to evaluate immigration processes within the country of residence, as it takes into account immigrants' perceptions and opinions about their own lives (e.g., Hendriks and Bartram, 2019; Paparusso, 2019). Indeed, subjective well-being is a personal evaluation that people make of their own lives (Amati et al., 2018). Hendriks and Bartram (2019) stressed that the measure of subjective well-being by means of a comprehensive indicator incorporating several life domains has many advantages. This approach does not exclude any domain a priori. Individuals are able to weigh the importance of different aspects of life for themselves and to evaluate their own outcomes. In addition, subjective measures of well-being may be more effective than objective measures of outcomes because they take into account different personal aspirations and expectations. Indeed, individuals with similar levels of well-being as assessed by objective measures may report different outcomes in terms of subjective well-being (Hendriks and Bartram, 2019).

Previous studies addressing the recent inflows of refugees in the German context have identified various health risks that recent refugees suffer from. While these health risks can be partly attributed to past experience, current circumstances in the country of settlement seem to play an important role as well. For instance, Dietrich et al. (2019) and Renner et al. (2020) found symptoms of anxiety, depression, and posttraumatic stress disorder (PTSD) among Syrian refugees living in Germany due to both pre- and postmigration factors. Similar results were obtained by Georgiadou et al. (2018), who found lower levels of mental illness among Syrian refugees than in previous studies, attributing the better health outcomes to postmigration factors, such as living conditions, in Germany. Walther et al. (2020) also found that postmigration factors such as greater stability, secure legal status, nontemporary housing, family reunification, language abilities and social contacts had a positive impact on refugees' mental health outcomes and subjective life satisfaction (*see* also Gambaro et al., 2018; Löbel and Jacobsen, 2021). Jaschke and Kosyakova (2021) found evidence of significant health improvements in terms of self-related health and well-being among refugees when they were provided early and comprehensive access to the health system.

While addressing various aspects of refugees' health determinants in general, previous research lacks a longitudinal perspective of the potential role of pre- and postarrival stress factors in various dimensions of well-being. Due to the specific nature of refugees' migration in which pre- and perimigration factors overlap, we distinguish pre- and postarrival factors, which will be closely discussed in the following subsections.

The Role of Prearrival Experiences

The literature has shown that refugees indicate poorer health outcomes in general and poorer mental health outcomes in particular than other types of immigrants (Chin and Cortes, 2015). For instance, analyzing studies published between 1966 and 2002, Fazel et al. (2005) found that the prevalence of mental illness among refugees is much more widespread than in the native population. The greater health deprivation of refugees has been partly attributed to the "refugee-producing event that they faced – the persecution or threat of persecution" (Chin and Cortes, 2015, 609).

For instance, in a systematic review of studies conducted between 1990 and 2007, Lindert et al. (2009) found that refugees are at higher risk of depression than labor migrants. Indeed, contrary to labor migrants, refugees have been exposed to **traumatic experiences** such as violence and political repression in their home countries. Similar results were obtained by Kirmayer et al. (2011), who reviewed papers published between 1998 and 2009 on the mental health of migrants and refugees. They found that refugees who have had severe exposure to violence often have higher rates of trauma-related disorders, including posttraumatic stress disorder and chronic pain or other somatic syndromes (*see* also Schweitzer et al., 2011). Steel et al. (2009) found that refugees exposed to torture and political repression are at higher risk of mental illness.

Moreover, Schapendonk et al. (2020) conducted a broad literature review on the complexity, fragility and indetermination of refugees' **migration pathways**. The role of migration pathways was also addressed by Beiser and Hou (2016), who explored the role of perimigration encounters by examining the time spent in refugee camps. This negative experience during the migration process was positively associated with refugees' emotional problems but not with aggressive behavior. In the case of complex migration pathways, the distinction between migration from the home country or the country of last residence challenges the distinction between pre- and perimigration. Paniagua et al. (2021) identified the search for well-being as both a causal driver of the pathway of migration and an outcome of migration.

Although economic stress factors do not constitute major reasons for refugee migration (Chiswick, 1999; Chin and Cortes, 2015), several prior studies have stressed **financial**

stress before migration as shaping refugees' health outcomes. For instance, Kim et al. (2020) reported strong associations between financial stress and depression in African refugees in the United States. Dietrich et al. (2019) found significant effects of financing refugee moves on young Syrian and Iraqi PTSD diagnoses. A possible explanation here is that refugees with accumulated financial resources have better opportunities to decrease the risks and negative expectations associated with refugee migration. In turn, Bauer et al. (2020) showed reduced life satisfaction for refugees previously living in higher classes in their countries of origin. This finding was explained in terms of the stronger risks of downward mobility that higher classes face when arriving in the receiving country (Bauer et al., 2020).

The Role of Postarrival Experiences

In addition to prearrival stressors, the literature on refugees' health outcomes and subjective well-being stresses the importance of postmigration experiences (Kirmayer et al., 2011; Bogic et al., 2015; Li et al., 2016). According to the well-known "healthy migrant effect" (Antecol and Bedard, 2006; Kennedy et al., 2015), in the first period after arrival in receiving countries, migrants report better health than the native population. Indeed, migrants are positively self-selected from the population of their countries of origin (Borjas, 1987). However, a large number of studies have shown that the initial advantage of migrants decreases over time and generations (Mladovsky, 2011) and with the changing composition of migrant inflows (Kristiansen et al., 2016). Several factors can account for the loss of health advantages of migrants: early life conditions in the country of origin play an important role; nevertheless, exposure to risk in the destination country also plays a prominent role. Migrants are often exposed to several kinds of deprivations, both material and immaterial, such as poverty, social exclusion, poor housing, discrimination, and social isolation, leading to the so-called "exhausted migrant effect" (Bollini and Siem, 1995; Nazroo, 2003; Borrell et al., 2015; Cela and Barbiano di Belgiojoso, 2019). These stressful experiences place migrants' health at risk: migrants often work and live in poor environments, lack protective factors such as close family members, and lack or have limited access to health care, exposing them to risky behaviors such as smoking and alcohol abuse, unhealthy diets and sedentary lifestyles (Antecol and Bedard, 2006; De Luca et al., 2013; Borrell et al., 2015; Kristiansen et al., 2016).

Some recent studies have argued that the stress that refugees experience in destination countries (a.k.a. postmigration stress) may heighten their existing mental problems (e.g., Porter and Haslam, 2005; Li et al., 2016) and be an even more important predictor of refugees' mental health status than traumatic experiences before and during the flight (but, *see* Schweitzer et al., 2011; e.g., Beiser and Hou, 2016). In the following, we focus on several postmigration stressors that have been identified as important determinants of refugees' health outcomes.

The first postarrival stress factor is the acquisition of an established **legal status**. For instance, Kosyakova and Brenzel (2020) demonstrated the relevance of the timing of the granting of legal status regarding individuals' access to education and the labor market (*see* also van Tubergen, 2010; Hainmueller et al., 2016; Hvidtfeldt et al., 2019). Likewise, Robjant et al. (2009) revealed a negative impact of living in detention centers on refugees' health, which is likely related to uncertainty about future residence status, fear about deportation and precarious living conditions in the facilities. In this sense, lengthy asylum procedures may directly and indirectly trigger and exacerbate the trauma that refugees have suffered in their countries of origin or during flight (Coffey et al., 2010). Silove et al. (1998) identified the asylum process, e.g., regular contact with public authorities, as a stressor itself in the setting of Tamil refugees in Australia. This observation is consistent with the findings of Laban et al. (2004), who provided evidence for the adverse effects of lengthy asylum procedures on the mental health of Iraqi refugees in the Dutch context.

A second postarrival stress factor relates to the **housing situation**. A lack of access to stable and secure housing has been shown to heighten refugees' stress levels (Porter and Haslam, 2005; Georgiadou et al., 2018; Walther et al., 2020; Jaschke and Kosyakova, 2021) since life in temporary collective accommodations hinders privacy and autonomy and increases isolation from the local community (Adam et al., 2019). Moreover, poor housing situations might be linked to the financial and social deprivation that refugees are likely to experience in the early arrival stages (Krahn et al., 2000).

The research has also identified that **labor market** access – which refugees often lack – is a key factor affecting refugees' health and well-being. In this context, unemployment has been identified as an important predictor of mental health problems (Kim, 2016) and postmigration depression among refugees (Beiser and Hou, 2001). These findings were further supported by Maqul et al. (2020), who stressed the role of structural integration in refugees' life satisfaction. Similarly, a meta-analysis by Porter and Haslam (2005) indicated an increase in mental health indicators associated with economic prosperity after migration.

A fourth factor is the acquisition of the **language of the receiving country**. Previous studies have implied that the lack of host country language fluency is a significant predictor of depression in the postmigration period (e.g., Beiser and Hou, 2001; Söndergaard and Theorell, 2004; Kartal et al., 2018). Indeed, refugees who are not fluent in the host country language experience a lack of integration both in society and in the labor market. For instance, Green (2017) and Aljadeeah et al. (2021) documented the importance of language knowledge and the existence of language barriers among refugees in Germany, which prevented them from having full access to health care (*see* also Jaschke and Kosyakova, 2021).

DATA AND METHOD

IAB-BAMF-SOEP Survey of Refugees in Germany

For our analysis, we rely on data from the IAB-BAMF-SOEP Survey of Refugees in Germany, a longitudinal survey of refugees and their household members conducted annually (Brücker et al., 2017). The target population for this survey is drawn from the

Central Register of Foreigners (*Ausländerzentralregister*, AZR), the national registry of all foreign citizens in Germany. The survey covers all individuals seeking asylum or any other form of protection, irrespective of their current legal status, who arrived in Germany for humanitarian reasons between 2013 and 2016 and were registered in the AZR by January 2017.

The first wave of the survey was conducted between June and December 2016 and included 4,465 adult refugees (i.e., aged above 17 in the interview year). The gross participation rate was approximately 50 percent of addresses originally drawn, which is substantially higher than the participation rate of comparable surveys of the German population (Kroh et al., 2017). Interviews were conducted face-to-face with computer assistance (CAPI) and were supported by interpreters, if needed. The questionnaires were available in seven languages (Arabic, English, Farsi/Dari, German, Kurmanji, Pashtu, and Urdu) and included auditory instruments for survey participants who were illiterate. The second wave included 67 percent of the participants in the first wave as well as an additional sample, resulting in the collection of data from 2,559 panel respondents and 2,897 first-time respondents (Brücker et al., 2020). The response rate of the panel respondents in the third wave was 68 percent, and the panel stability was 80 percent (Britzke and Schupp, 2020). The fourth-wave response rate amounted to 65 percent, and the panel stability was 89 percent (The SOEP Group, 2020). As a result, the data from the IAB-BAMF-SOEP Survey of Refugees in Germany included 8,321 adult persons (18 yr and older) who contributed 18,342 person-year observations over the four survey waves.

Analytical Sample

For our analyses, we restrict the initial sample to refugees from Afghanistan, Eritrea, Iraq and Syria (1,490 respondents were dropped). This restriction ensures that we consider the quantitatively largest refugee groups that arrived in the time window of 2013–2016. We also exclude individuals who were identified as nonrefugees (59 respondents were dropped) and those above age of 55 at the first interview (273 respondents were dropped). Further, we confine our sample to refugees who arrived between 2014 and 2016 in Germany to ensure duration of stay of a maximum of 3 yr before the fourth interview (545 respondents were dropped). For similar reasons, we keep only respondents with their first interview taking place maximum 3 yr after arrival in Germany (196 respondents were dropped). Given the dynamic lens of our analyses, we further restrict our data to respondents with a first interview in 2016 or 2017 (359 respondents were dropped) and those who had participated in at least 2 survey waves (1,425 respondents were dropped). Finally, we drop respondents with missing information on dependent variables in the first interview (17 respondents were dropped). In total, this approach yields an unbalanced panel including 3,957 individuals with 11,464 observations. **Supplementary Table S1** explains the sample selection in more detail.

Dependent Variables

We consider self-rated health and life satisfaction as dependent variables. For the analyses of self-rated health, we rely on the question "How would you describe your current state of health?" Respondents could answer on a scale ranging from 1 ("poor") to 5 ("very well"). This question is a widely used item in many health studies in the social sciences. Research on this particular question has shown that self-assessment is a strong predictor of mortality because it proxies general physical well-being (e.g. Mossey and Shapiro, 1982). In general, self-rated health is argued to combine "the subjective experience of acute and chronic, fatal and nonfatal diseases, and general feelings of well-being, such as feeling run down and tired or having backaches and headaches" (Mirowsky and Ross, 2008, 104). Therefore, the employed self-assessment also incorporates some mental health aspects. In general, however, it approximates the physical health domain.

In contrast, life satisfaction represents the cognitive dimension of individuals' lives. We rely on the well-established 11-point scale that is used in many long-running panel surveys around the world and that is widely used by researchers (Lucas, 2007; Green, 2011). Empirically, we rely on answers to the question "How satisfied are you currently with your life in general?" Respondents could answer on a scale ranging from 0 ("totally dissatisfied") to 10 ("totally satisfied"). The life satisfaction construct refers to "the degree to which an individual judges the overall quality of his/her own life as-a-whole favourably. In other words: how much one likes the life one leads" (Veenhoven, 2012, 67). In line with research on self-rated health and mortality, other research has shown that cognitive evaluations of individuals' lives can also predict mortality (Diener and Chan, 2011). Thus, both outcomes under study constitute outcomes relevant to the quality of individuals' lives. Furthermore, the employed data empirically support this conjecture and show that the correlation between the two variables amounts to only 0.26 at the first interview and to 0.23 on average over the four observed survey waves.

Analytical Strategy

We investigate the role of pre- and postarrival factors in refugees' life satisfaction and self-rated health in four analytical steps.

Based on ordinary least squares (OLS) regressions, we first provide a multivariate description of our dataset to compare the findings for our analytical sample to previous findings in the literature on refugees. In doing so, we investigate the association of important socioeconomic characteristics with the employed outcome measures at the time of the first interview (for details on the variables, *see* **Section 3.5**).

Second, we investigate the importance of prearrival factors for life satisfaction and self-rated health at the first interview. In doing so, we model the influence of four mechanisms (i.e., reasons for leaving, migration route, financing, and traumatic events) separately, holding the set of control variables constant before estimating a saturated model that accounts for all prearrival mechanisms under study.

Third, we employ fixed effects (FE) estimators to elaborate on the influence of postarrival mechanisms (i.e., changes in legal status, housing situation, German language proficiency, and work status) on the outcome measures under study. The advantage of employing FE models is that time-constant unobserved heterogeneity no longer biases the estimates (Allison, 2009). Compared to estimators which rely on between person variation and therefore

on the unit homogeneity assumption, FE models rely on the temporal homogeneity assumption (Firebaugh et al., 2013). As we are explicitly interested in how changes in the migration process are associated with refugees' life satisfaction and health, FE estimations that rely on a weaker exogeneity assumption constitute the best way to describe this process.

Fourth, we take a dynamic perspective and investigate how changes in postarrival statuses affect changes in life satisfaction and self-rated health over time with random effects growth curve (REGC) models.[4] As we are particularly interested in whether transitions to certain postarrival statuses lead to convergence or divergence of life satisfaction or health profiles over time, we employ an estimator relying on between person variation. For this purpose, we rearrange the coding of the postarrival variables and always analyze three different groups. We show the development of the life satisfaction and self-rated health of refugees who had already been granted protection status at the first interview and contrast their well-being development with that of refugees who were granted protection status later or who were never granted protection status during the observation period. The four postarrival states under study are the possession of a permanent work contract, the possession of protection status, improvement of German language skills, and the housing situation. Employing this view with our longitudinal dataset facilitates the investigation of whether adverse states after arriving in Germany, such as a lack of protection status, impair life satisfaction and self-rated health in the long run and whether transitions out of these adverse states increase both health outcomes.

Independent Variables

For analysis, we employ a set of explanatory and additional control variables. Regarding explanatory variables, we distinguish between prearrival and postarrival variables, i.e., individuals' characteristics that developed before or after arriving in Germany. **Supplementary Tables S2–S4** in the supplementary online appendix provide descriptive statistics on the prearrival, postarrival and control variables, respectively.

Regarding prearrival stress factors, we consider reasons for leaving the home country, multiple means of transport to reach Germany, migration financing and traumatic events during migration. To capture the multiple motivations for leaving the home country, we employ a count variable, which captures two dimensions of migration motives that go beyond political reasons such as persecution and fleeing because of war and conflict:[5] social reasons (referring to friends and family) and economic reasons. Regarding migration financing, we distinguish between financial support from family or friends and financing through marketing assets (an individual's own properties or labor). To capture the burden of migration, we code a count variable indicating the possible use of multiple means to move from the country of origin to Germany. This variable reflects both the duration and complexity of the move in a straightforward way. The variable trauma events reflects the number of a variety of traumatic experiences, which are typically recognized as causal factors for PTSD (Silove et al., 1997).

As introduced in **Section 3.4**, we also explore the role of socioeconomic characteristics of refugees in their well-being outcomes. The considered socioeconomic factors include age, gender, premigration educational attainment, perceived premigration socioeconomic status (relative to that of others in the origin country), the location of the partner at the first interview and German language proficiency. Furthermore, we describe the influence of legal status and accommodation type at the first interview and show the importance of accounting for methodological factors.

While prearrival variables are retrospectively measured and time constant, postarrival variables may vary over waves. As time-varying postarrival stress factors, we employ protection status, labor market status, housing situation, and German language proficiency. We distinguish among three forms of legal status that could characterize refugees in Germany: *1*) protection status is still under approval, *2*) protection is granted, and *3*) protection status is denied. Over time, the "protection is granted" status becomes the absorbing status. The variable housing situation distinguishes among individuals living in *1*) shared housing and *2*) private houses or flats. The acquisition of German language proficiency ranges from very poor to very good on a 5-point scale and reflects the respondents' self-assessment of their German skills. Labor market status indicates individuals' position at the time of interview and follows the ILO concept of labor market status (Brandolini et al., 2006). We distinguish five labor market statuses: *1*) permanent work contract, *2*) temporary work contract (including marginal jobs), *3*) participation in education or training, *4*) job-seeking and *5*) inactivity (including all other activities).

For the dynamic analysis with REGC models, we slightly rearrange these variables and always distinguish among individuals who were already in the "positive" state at the first interview, who transitioned to this "positive" state later, and who never transitioned to the "positive" state (refer to **Section 3.4**). Furthermore, the dynamic modeling uses time since the first interview dummies as growth factors.

As time-varying control variables, we employ the year of the interview and dummy variables indicating the number of survey waves in which the individuals participated. In doing so, we control both for period effects and panel conditioning (Warren and Halpern-Manners, 2012). The interviews were performed between 2016 and 2019, and the respondents participated in a minimum of two and a maximum of four survey waves. We control for the quality of interviews by means of an indicator for third persons being present at interview (e.g., partner or third persons such as an interpreter or others) and an indicator of whether the respondents were answering sensitive questions. We also account for the respondent's region of residence (federal state) at the time of the interview.

[4]Results from hierarchical growth curve models are identical (refer to **Supplementary Figures S1, S2** in supplementary online appendix).

[5]Following the IAB-BAMF-SOEP Survey of Refugees, 97 percent of the respondents reported having left their countries of origin due to war or civil war, persecution, discrimination or forced labor in our sample. For these reasons, we do not consider political reasons in our measure for multiple motivations for leaving the home country.

TABLE 1 | Life satisfaction and self-rated health at the first interview.

	Life satisfaction		Self-rated health	
	Model 1.1 (Baseline)	**Model 1.2 (Extended)**	**Model 2.1 (Baseline)**	**Model 2.2 (Extended)**
Country of origin (ref. Syria)				
Afghanistan	0.336**	0.395***	−0.137**	−0.126*
Eritrea	0.364*	0.598***	0.119	0.221**
Iraq	0.207+	0.236*	−0.109*	−0.078
Sociodemographics				
Age	−0.042	−0.062*	−0.008	0.001
Age squared	0.000	0.001+	−0.000*	−0.000*
Male		−0.091		0.294***
Highest professional educational attainment (ref. No professional education)				
Vocational education		−0.219		0.034
University		−0.545***		0.042
Other		0.047		0.169
Socioeconomic status (ref. Low)				
Medium		0.165+		0.112**
High		−0.013		0.127**
German language proficiency (ref. None at all)				
Not very good		0.104		0.101+
Average		0.447***		0.231***
Good		0.403*		0.375***
Very good		0.921**		0.563***
Residence of partner (ref. No partner)				
Germany		0.430***		0.036
Abroad		−0.273+		−0.032
Migration-related factors				
Arrival year (ref. 2016)				
2014	0.054	−0.280+	0.053	−0.099
2015	−0.050	−0.123	0.111*	0.025
Legal status (ref. In process)				
Protection granted	0.546***	0.403***	0.126**	0.093*
Protection denied	0.119	0.077	0.020	0.010
Type of residence (ref. Shared accommodation/other)				
Private flat/house		0.723***		0.054
Methodological factors				
Survey wave at first interview (ref. 2016)				
2017	0.018	−0.064	−0.042	−0.069+
Third person present at the interview (ref. Partner)				
Other third person	−0.660***	−0.354**	−0.096*	−0.119*
No third person	−0.590***	−0.272**	−0.088*	−0.162***
Partner and other third person	−0.359+	−0.343+	−0.099	−0.11
Constant	8.243***	7.607***	4.616***	4.024***
Number of persons	3,957	3,957	3,957	3,957
Adj. R^2	0.026	0.067	0.094	0.130
F Statistic	4.426	6.951	14.187	13.349

*Statistical significance at: +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001. OLS regression coefficients. Dependent variables: Overall life satisfaction (0–10) and self-rated health (1–5). Control variables: federal state fixed effects, other legal status and indicators for missing values in independent variables.* Data*: IAB-BAMF-SOEP Survey of Refugees, waves 1–4.*

RESULTS

Life Satisfaction and Self-rated Health of Different Refugee Groups

Forced migration typically indicates both adverse conditions in the home country, which motivate migration, and the logistical details of the migration itself. In the first step, we address the association of the socioeconomic situations of refugees who arrived in Germany between 2014 and 2016 and their life satisfaction and self-rated health at the first interview. The corresponding results for life satisfaction and self-rated health are presented in **Table 1**. For both outcomes, we present a baseline model (Models 1.1 and 2.1) and an extended model (Models 1.2 and 2.2).

Following the baseline specification, life satisfaction varies significantly by country of origin: compared to refugees from Syria, those from Iraq, Eritrea and Afghanistan report significantly higher life satisfaction (Model 1.1). In line with the literature (Frijters and Beatton, 2012), life satisfaction decreases with age. Note, however, that this relationship becomes statistically significant only when accounting for all model covariates (Model 1.2). Life satisfaction does not vary

significantly by year of arrival or by year of the first interview (Model 1.1).

The results from the extended model, which additionally accounts for sociodemographic variables, imply that social origin is significantly related to life satisfaction (Model 1.2). In particular, refugees with university education report lower levels of life satisfaction, while those with medium perceived premigration socioeconomic status report higher levels. The level of fluency in the German language has a positive correlation with life satisfaction. Refugees with a partner living in Germany report higher life satisfaction than those without a partner (singles), while having partners living abroad is negatively related to life satisfaction (Stahnke and Cooley, 2020). In regard to legal status, compared to pending protection, granted protection status is positively related to life satisfaction, while denied protection is not significantly different. Similarly, compared to living in shared or other type of accommodations, living in private housing is positively related to life satisfaction.

In contrast to the results for life satisfaction, those for self-rated health show more variance between countries of origin (Model 1.2). Compared to refugees from Syria, those from Iraq and Afghanistan seem to be worse off, while refugees from Eritrea report better health status in the extended model (Model 2.2). Surprisingly, age is less associated with health status, which might reflect refugees' specific migration motives and migration experience. In contrast to the results for life satisfaction, we observe a positive correlation between a higher premigration socioeconomic status and self-rated health status. In turns, education is not significantly related to health. With respect to further socioeconomic factors, we find no impact of housing or partnership on self-rated health status and only a weak impact of socioeconomic status. The results for legal status and German language proficiency are similar to those for life satisfaction.

The Impact of Prearrival Experiences on Refugees' Life Satisfaction and Subjective Health

In **Table 2**, we introduce a set of possible prearrival mechanisms affecting life satisfaction (Panel A) and subjective health (Panel B) to the extended models (Model 1.2 and Model 2.2, respectively). We assume that worse premigration circumstances and migration conditions affect refugees' life satisfaction and self-rated health at the first interview. In particular, we address four possible prearrival mechanisms: reasons for leaving the country of origin, complexity of the move, financing of the move and traumatic experiences while migrating to Germany. In a full model, we test for collinearity of the single mechanism of interest.

Respondents with multiple motives for migration (social and/or economic motives) generally report lower levels of life satisfaction at the first interview than those oriented by one migration motive (Model 1.3). Moreover, we observe that those reported only social reasons (such as leaving because of family or friends) for leaving country of origin display higher life satisfaction levels compared to other groups. This might reflect the fact that joining the family or social contacts in the destination country is an important driver of refugees' life satisfaction. This findings have been also mirrored in the literature stressing the positive role of family reunification of refugees' mental health (Löbel, 2020; Löbel and Jacobsen, 2021).

In the same way, the complexity of the migration move approximated by the number of means of transport negatively affects individuals' life satisfaction (Model 1.4). For instance, one additional transport mode reduces life satisfaction by 0.08 points. Given that the reported modes of transports vary between 1 and 9, the maximum number of which associates with 0.69 points decrease in life satisfaction. Additional analyses imply that an increasing number of means of transport is correlated with factors such as the type of migration route taken from the country of origin to Germany, temporary residence in third countries and migration duration. Thus, the number of means of transport captures the complexity and stress of migration to Germany.

In turn, we find no correlation of financing migration through marketing assets or social networks on the respondents' life satisfaction at the first interview (Model 1.5). However, there is a negative impact of traumatic experiences on life satisfaction (Model 1.6). The maximum number of the surveyed traumatic events amounted to seven. With one traumatic event costing 0.161 points on satisfaction scale from 0 to 10, the maximum number of traumatic experiences that the respondents were exposed during migration would reduce refugees' life satisfaction by more than one point which is substantial.

The full model confirms the single mechanism-based models and indicates no problems of collinearity (Model 1.7). The direction of each mechanism affecting individual life satisfaction supported by the single-mechanism models holds in the full model. The finding that premigration stress factors seem to be important predictors of refugees' life satisfaction in the first interview indicates that the refugees were still at the beginning of a possible process of integration or adaption to German society at that time.

Regarding self-rated health, the analysis provides only partial support for our mechanism of interest. Multiple motivations for migrations show a weak negative impact on self-rated health at the first interview (Model 2.3). We find no impact of either the complexity of the move (Model 2.4) or the mode of financing the migration (Model 2.5). Nevertheless, we find that multiple exposures to traumatic experiences severely reduce self-rated health (Model 2.5). On the scale between 1 and 5, an exposure to a one traumatic event during migration reduces self-rated health by 0.106 points. Again, the full model confirms the single-mechanism models, but in this model, the impact of multiple motives for migration is weakened (Model 2.6). Thus, refugees' self-rated health at an early stage of integration into German society seems to be mainly driven by traumatic experience before arrival at Germany.

The Impact of Postarrival Experience on Refugees' Life Satisfaction and Self-rated Health

Table 3 depicts the partial correlations of postarrival experiences with life satisfaction (Panel A) and self-rated health (Panel B). As in the previous subsection, we introduce the mechanisms of interest separately before estimating a full model incorporating all mechanisms at once.

TABLE 2 | Associations between prearrival experiences and life satisfaction and self-rated health at the first interview.

Panel A: LIFE SATISFACTION

	Model 1.3	Model 1.4	Model 1.5	Model 1.6	Model 1.7
Reasons for leaving (ref. Social reasons only)					
None of these	−0.350*				−0.381*
Economic reasons only	−0.427**				−0.416**
Economic and social reasons	−0.428*				−0.410*
Number of different modes of transport		−0.077**			−0.051+
Financing of migration via family/friends			−0.13		−0.066
Financing of migration via marketing assets			−0.066		0.025
Number of traumatic events				−0.161***	−0.144***
Number of persons	3,957	3,957	3,957	3,957	3,957
Adj. R^2	0.069	0.07	0.068	0.073	0.074
F Statistic	6.546	6.823	6.551	7.097	6.252

Panel B: SELF-RATED HEALTH

	Model 2.3	Model 2.4	Model 2.5	Model 2.6	Model 2.7
Reasons for leaving (ref. Social reasons only)					
None of these	−0.092				−0.102
Economic reasons only	−0.147*				−0.139+
Economic and social reasons	−0.133+				−0.119
Number of different modes of transport		−0.015			0.003
Financing of migration via family/friends			−0.083+		−0.047
Financing of migration via marketing assets			−0.009		0.036
Number of traumatic events				−0.106***	−0.105***
Number of persons	3,957	3,957	3,957	3,957	3,957
Adj. R^2	0.131	0.131	0.131	0.14	0.141
F Statistic	12.281	12.681	12.485	13.654	11.798

*Statistical significance at: +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001. OLS regression coefficients. Constant not shown. Full regression results in* ***Supplementary Table S5****. Dependent variables: Overall life satisfaction (0–10) and self-rated health (1–5). Control variables: country of origin, age; gender; survey year fixed effects; federal state fixed effects; third person present at interview; year of arrival fixed effects; premigration education; legal status at the first interview; type of accommodation; premigration socioeconomic status; location of partner; German language proficiency; and indicators for missing values in independent variables.* Data*: IAB-BAMF-SOEP Survey of Refugees, waves 1–4.*

Model 3.1 tests whether changes in legal status shape refugees' life satisfaction. Receiving a protection status appears to be positively associated with life satisfaction, while denials of applications lead to lower life satisfaction; however, the results do not reach the conventional level of statistical significance. Model 3.2 shows the role of labor market transitions in changes in life satisfaction. The results imply that changes from inactive to work or education appear to be positively associated with changes in life satisfaction. The partial correlation between life satisfaction and permanent work seems to be mostly pronounced. In turn, changing from an inactive work status to a job-seeking work status slightly decreases life satisfaction, albeit not statistically significant. The results further imply that with increasing German language skills over time, life satisfaction increases (Model 3.3). In particular, improving German language skills to a good or a very good level (from not at all) is associated with increases in life satisfaction of 0.355 and 0.501 points, respectively. Model 3.4 further shows that a change in residence from shared or other accommodations to a private flat or house leads to an increase in life satisfaction by 0.478. The full model suggests no changes in the direction and almost no changes in the size of the coefficients when all four mechanisms of interest are included simultaneously (Model 3.5). Accordingly, the mechanisms under study have independent influences on life satisfaction.

Regarding self-rated health, Model 4.1 shows that receiving protection status is positively associated with self-rated health: the change from an unclear legal situation to granted protection exhibits a statistically significant partial correlation of 0.09. At the same time, we also observe that the change to a rejected application is positively and significantly related to self-rated health. It appears that it is not a type of decision but having a decision on asylum application which is important for self-rated health. Similar relationship was established for refugees' labor market entry and language course entry (Kosyakova and Brenzel, 2020), supporting the idea that waiting in limbo is particularly detrimental for refugees' health outcomes (Bakker et al., 2014). The second postarrival mechanism related to refugees' labor market situation implies that all transitions – transition to permanent working contract in particularly – out of inactive work status are positively and statistically significantly associated with increases in self-rated health (Model 4.2). Similar to the findings on life satisfaction, improvements in German language skills over time are positively associated with changes in self-rated health (Model 4.3). However, only the substantial improvement in German skills from no skills at all to good or very good German language proficiency is significantly different from zero and increases self-rated health by 0.13 and 0.20 points, respectively. In contrast to the findings on life satisfaction, a change from shared accommodations to a private flat or house is not statistically significantly associated with increases in self-rated health (Model 4.4). The inclusion of all mechanisms in Model 4.5 again suggests no changes in direction and almost no changes

TABLE 3 | Associations between postarrival experiences and life satisfaction and self-rated health.

Panel A: LIFE SATISFACTION

	Model 3.1	Model 3.2	Model 3.3	Model 3.4	Model 3.5
Legal status (ref. In process)					
Protection granted	0.128				0.095
Protection denied	−0.112				−0.125
Labor market status (ref. Inactive)					
Permanent work contract		0.159+			0.140+
Temporary work contract		0.142			0.127
In education		0.07			0.056
Job seeking		−0.055			−0.069
German language proficiency (ref. None at all)					
Not very good			0.096		0.092
Average			0.236+		0.216+
Good			0.355**		0.316*
Very good			0.501**		0.468**
Type of residence (ref. Shared accommodation/other)					
Private flat/house				0.478***	0.454***
Person-years	11,464	11,464	11,464	11,464	11,464
Number of persons	3,957	3,957	3,957	3,957	3,957
R^2 overall	0.002	0.002	0.002	0.006	0.009
R^2 within	0.009	0.01	0.01	0.014	0.018

Panel B: SELF-RATED HEALTH

	Model 4.1	Model 4.2	Model 4.3	Model 4.4	Model 4.5
Legal status (ref. In process)					
Protection granted	0.085*				0.083*
Protection denied	0.175*				0.168*
Labor market status (ref. Inactive)					
Permanent work contract		0.112**			0.102**
Temporary work contract		0.081*			0.076+
In education		0.060+			0.054
Job seeking		0.060*			0.053+
German language proficiency (ref. None at all)					
Not very good			0.018		0.021
Average			0.076		0.069
Good			0.134*		0.123+
Very good			0.195**		0.184*
Type of residence (ref. Shared accommodation/other)					
Private flat/house				0.043	0.032
Person-years	11,464	11,464	11,464	11,464	11,464
Number of persons	3,957	3,957	3,957	3,957	3,957
R^2 overall	0.029	0.03	0.032	0.023	0.044
R^2 within	0.009	0.009	0.01	0.008	0.012

*Statistical significance at: +p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001. FE regression coefficients. Constant not shown. Full regression results in* ***Supplementary Table S6****. Dependent variables: overall life satisfaction (0–10) and self-rated health (1–5). Control variables: gender, age, survey year at first interview, federal state fixed effects, third person present at the interview, dummies indicating the number of interviews (panel conditioning), and indicators for missing values in independent variables.* Data*: IAB-BAMF-SOEP Survey of Refugees, waves 1–4.*

in the size of the coefficients, implying independent influences of the mechanisms under study on self-rated health.

Development of Refugees' Life Satisfaction and Self-rated Health Over Time and the Role of Postarrival Experiences

To explore the overall development of refugees' well-being, **Figure 1** depicts the changes in life satisfaction (left-hand side) and self-rated health (right-hand side) since the first interview. While the data exhibit only small overall changes in life satisfaction (with the overall development following a slight u-shaped pattern), self-rated health increases over time.

To examine in detail the importance of changes in postmigration experiences for changes in refugees' life satisfaction and self-rated health over time, we slightly rearrange the coding of the postarrival variables regarding postmigration experiences (refer to **Section 3.4** and **Section 3.5**). In our REGC models, we now distinguish between refugees who never switch to a certain state and refugees who have a "positive" postmigration experience. **Figures 2**, **3** depict the results from the corresponding empirical exercise on refugees' life satisfaction (**Figure 2**) and self-rated health (**Figure 3**). For the

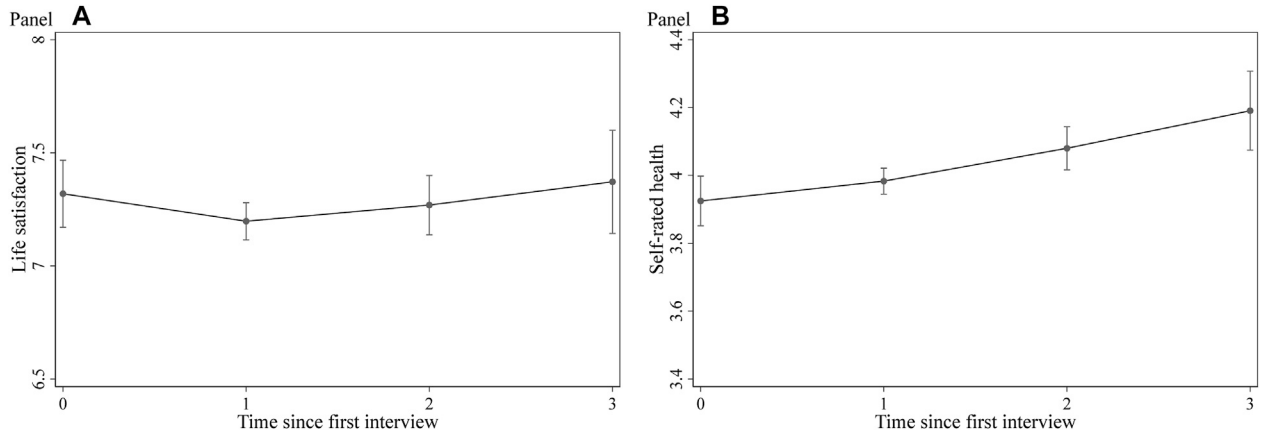

FIGURE 1 | Development of life satisfaction and self-rated health over time. *Note*. Conditional profile plots estimated by random effects growth curve models of life satisfaction (left-hand side) and self-rated health (right-hand side). The full regression results are displayed in **Supplementary Table S7** (model S7.1) and S8 (model S8.1) of the online appendix. Dependent variables: Overall life satisfaction (0–10) and self-rated health (1–5). Control variables: dynamic postarrival mechanisms (labor market status, legal status, language proficiency, and accommodation), gender, age, socioeconomic status before migration, arrival year, highest professional educational attainment, survey year fixed effects, federal state fixed effects, third person present at the interview, dummies indicating the number of interviews (panel conditioning), indicator for answering sensitive questions, and indicators for missing values in independent variables. *Data*: IAB-BAMF-SOEP Survey of Refugees, waves 1–4.

full models, see supplementary online appendix **Supplementary Tables S7, S8**.

Panel A in **Figure 2** illustrates the development of life satisfaction by legal status. In particular, we plot the development of life satisfaction for *1*) refugees with granted protection at the first interview, *2*) those who transitioned from waiting for a decision to receiving protection status, and *3*) those who never received protection over the observation window. The results clearly show that refugees with granted protection at the first interview initially have overall higher life satisfaction and that their life satisfaction changes slightly over time. For the group of refugees who receive protection later during the observation window, we observe first a slight decrease and then an increase in life satisfaction levels. For this group, we also observe a remarkable convergence of their life satisfaction levels with those of refugees with initially granted protection. In turn, refugees with denied protection show a decreasing trend in life satisfaction over the observation period. Overall, these results reveal that granted protection leads to increased life satisfaction.

To examine the role of labor market transitions, Panel B in **Figure 2** presents the development of life satisfaction for refugees who transition from nonpermanent employment, inactivity or other statuses to permanent employment and those who never make such a transition. Since the group of refugees who already had permanent employment at the first interview is very small, the estimations for this group are imprecise and, therefore, not displayed in **Figure 3**. The general trend is that transitions to permanent work result in higher life satisfaction levels in the long run. We also observe cumulative effects of language skills on the development of life satisfaction over time (Panel C in **Figure 2**). While life satisfaction of refugees with poor language skills declines over time, it increases among refugees with good or very good German skills at the first interview. This finding might indicate that skills in the language of the destination country are a crucial precondition for integration in the receiving society – a finding in line with the prior literature on refugees (van Tubergen, 2010; Arendt et al., 2020).

Turning to the housing situation, the results in Panel D in **Figure 2** reveal a substantial impact of housing conditions on the development of refugees' life satisfaction over time. In part, staying in shared accommodations during the entire observation period leads to a one-point lower life satisfaction level than that of refugees in private flats or houses at the time of the first interview. In turn, the life satisfaction levels of refugees transitioning from shared accommodation to private flats or houses converge with those of groups who initially had better housing situations.

In the final step, we replicate these models for refugees' self-rated health status; **Figure 3** illustrates the results. These dynamic analyses reveal slightly different conclusions than those for refugees' life satisfaction. First, we find no differences in the development of self-rated health by legal status (Panel A in **Figure 3**), thereby confirming the findings from our FE models presented in **Table 3** (Panel B). Regarding the labor market situation, the results suggest a positive impact of transitions to permanent work on self-rated health (Panel B in **Figure 3**). After 3 yr, differences between the two groups becomes even more pronounced, suggesting a long-lasting positive effect of structural integration on refugees' reported health status. Panel C in **Figure 3** shows the results for the association between German skills and the development of self-rated health. The results indicate that improvements in language skills are not associated with long-lasting increases in health levels and that refugees with poor language skills throughout the observation period have the lowest levels of self-rated health. This result provides a hint for a possible selection effect. Likewise, changes in housing conditions do not seem to play a significant role in the development of self-rated health over time (Panel D in **Figure 3**).

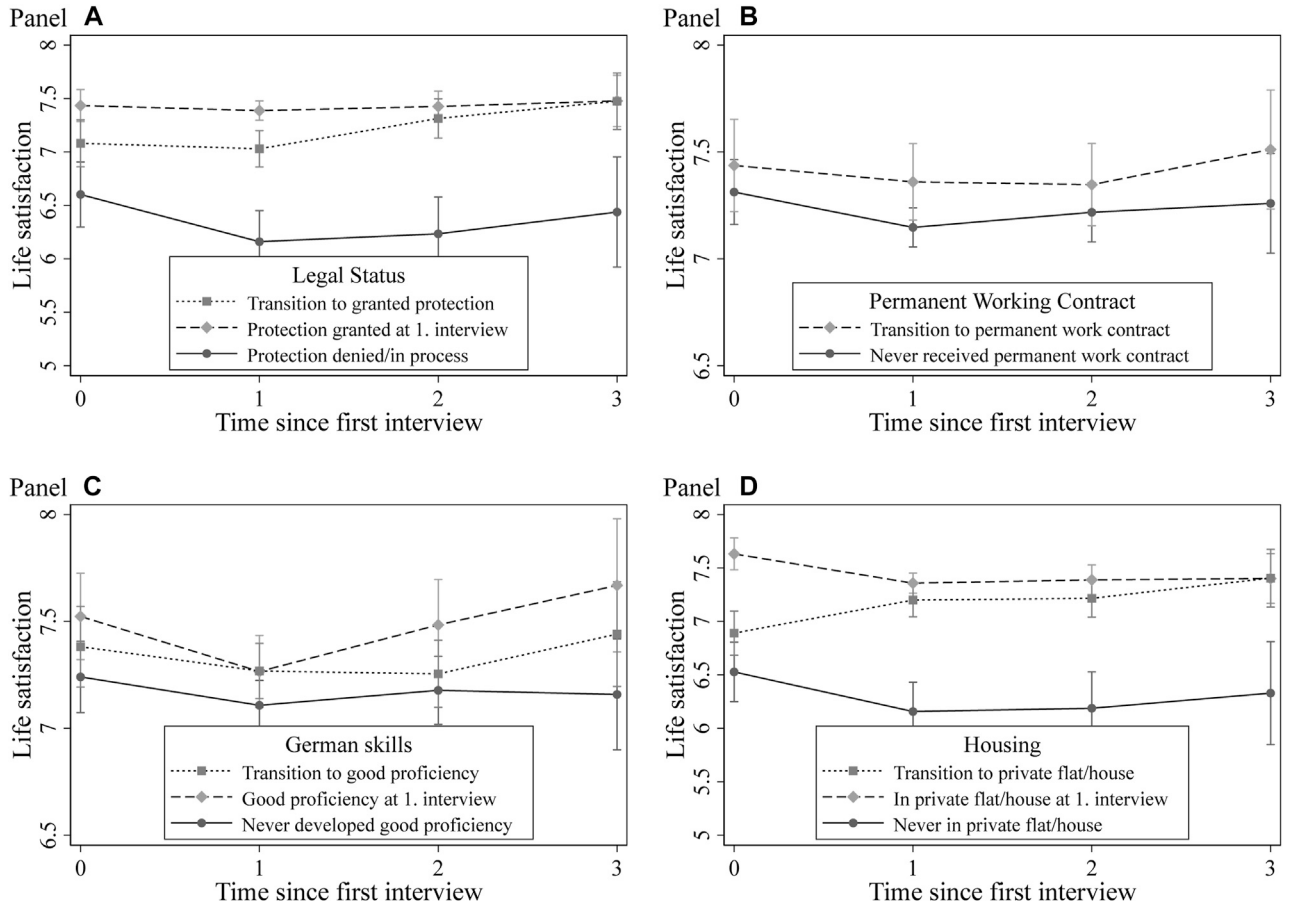

FIGURE 2 | Development of life satisfaction by postarrival mechanism. *Note*. Conditional profile plots of the influence of postarrival mechanisms on life satisfaction estimated by random effects growth curve models. The full regression results are displayed in **Supplementary Table S7** (models S7.2 to S7.5). Dependent variables: overall life satisfaction (0–10). Control variables: gender, age, socioeconomic status before migration, arrival year, highest professional educational attainment, survey year fixed effects, federal state fixed effects, third person present at the interview, dummies indicating the number of interviews (panel conditioning), indicator for answering sensitive questions, and indicators for missing values in independent variables. *Data*: IAB-BAMF-SOEP Survey of Refugees, waves 1–4.

DISCUSSION

The unprecedented inflow of refugees in Germany since 2015 has raised multiple challenges in terms of their integration into society. In this context, studying refugees' well-being outcomes is crucial because health status and overall life satisfaction are fundamental in shaping successful and sustainable integration into the economy (Chatterji et al., 2011) and society (Steptoe et al., 2015) of the destination country. Compared to other (labor) migrants, refugees' migration processes are typically more abrupt and often accompanied by threatening events due to wars, oppression, discrimination and violation of their human rights before and during their flights (Chiswick, 1999; Hatton, 2020; UNHCR, 2020). Moreover, refugees typically face substandard conditions in the places they live after they enter the host country and suffer from additional postmigration stress, such as lengthy asylum procedures, family reunification, financial burdens or cultural integration (Adam et al., 2019; Dietrich et al., 2019; Brücker et al., 2020; Walther et al., 2020; Jaschke and Kosyakova, 2021). It is not surprising, therefore, that refugees face worse well-being outcomes and greater health risks than types of other migrants (Fazel et al., 2005; Robjant et al., 2009), resulting in a slower integration process for them (Brücker et al., 2019).

In this study, we examined the impact of pre- and postarrival stress factors on the development of the subjective well-being (overall life satisfaction and self-rated health) of four main groups of refugees arriving in Germany in approximately 2015, namely, refugees from Syria, Iraq, Afghanistan and Eritrea. Empirically, we relied on the most recent longitudinal data from the IAB-BAMF-SOEP Survey of Refugees (2016–2019) representative for the recent refugee population in Germany and panel analysis techniques. In contrast to previous studies on recent refugees' health and well-being outcomes conducted in the German context, we do not only consider the level differences but also explicitly employed a dynamic perspective.

Overall, our results suggest that refugees' life satisfaction and, to a lesser extent, their self-rated health at an early stage of integration into German society are mainly driven by complexity of the move and particularly traumatic experiences before arrival at Germany. However, from a longitudinal perspective, we also provide evidence

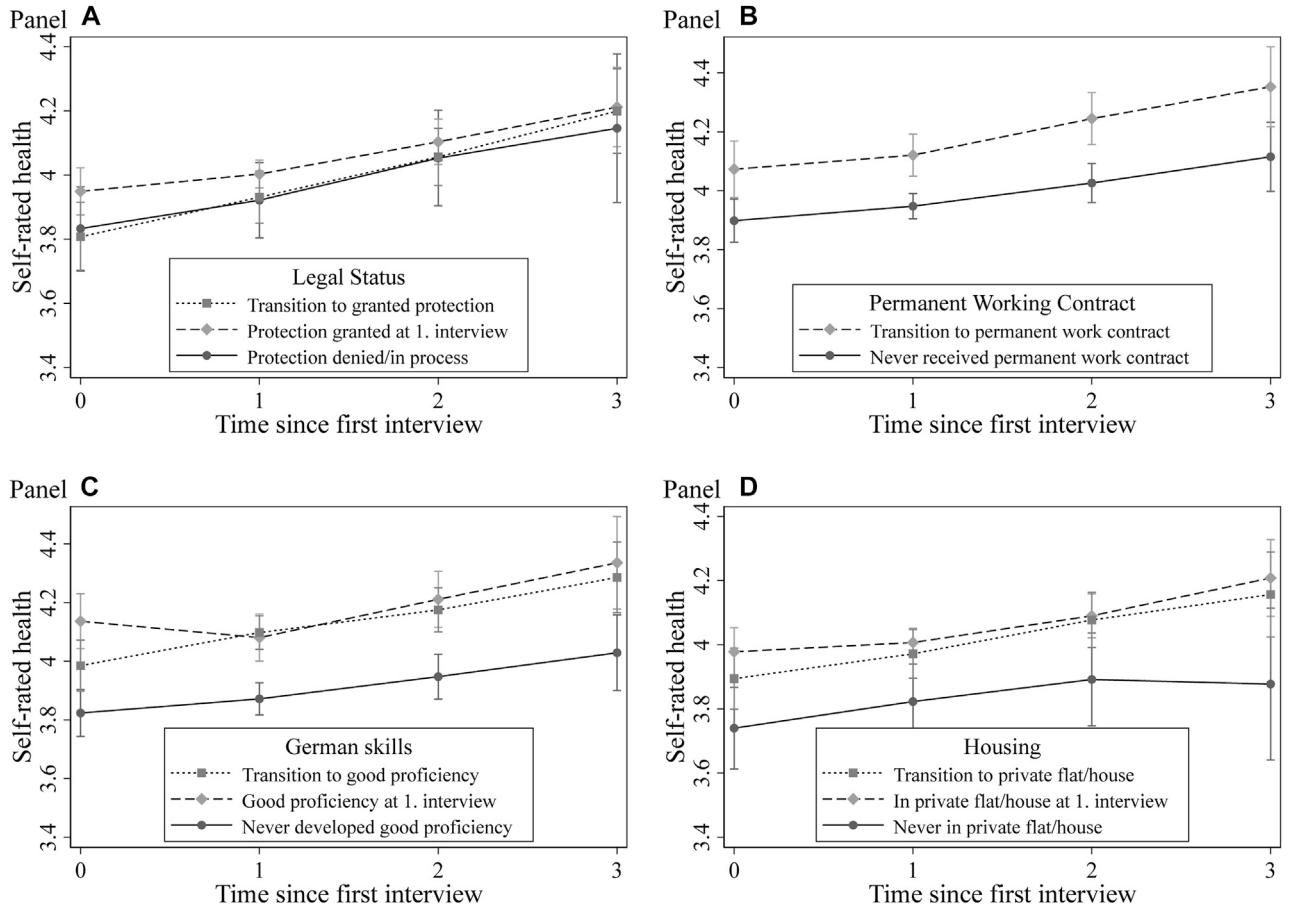

FIGURE 3 | Development of self-rated health by postarrival mechanism. *Note*. Conditional profile plots of postarrival mechanisms on self-rated health by random effects growth curve models. Full regression results in **Supplementary Table S8** (model S8.2 to S8.5). Dependent variables: Self-rated health (1–5). Control variables: gender, age, socioeconomic status before migration, arrival year, highest professional educational attainment, survey year fixed effects, federal state fixed effects, third person present at the interview, dummies indicating the number of interviews (panel conditioning), indicator for answering sensitive questions, and indicators for missing values in independent variables. *Data*: IAB-BAMF-SOEP Survey of Refugees, waves 1–4.

that both studied well-being outcomes improved slightly over the observation period. Accordingly, our results indicate a marginal overall recovery process of the arriving population. These findings are in clear contrast to the "healthy migrant narrative" and the related postarrival assimilation pattern (Antecol and Bedard, 2006; Kennedy et al., 2015). Indeed, previous research findings suggest that refugees do not fall within the healthy migrant paradox because they experience higher levels of mental and physical health problems than the general population in the host country (Fazel et al., 2005; Gerritsen et al., 2006a).

Our results confirm the findings of previous research on refugees' self-rated health and well-being. Consistent with a well-established literature in this field (e.g., Chin and Cortes, 2015; Dietrich et al., 2019; Walther et al., 2020), immediately after their arrival in Germany, refugees' life satisfaction and self-rated health are negatively affected by premigration stressors, such as multiple reasons for leaving the country of origin, the complexity of the migration route and especially the extent of traumatic events, while financial burdens show no effects on either well-being outcome. Regarding postarrival mechanisms, our research findings suggest that integration into German society measured by labor market participation, German language acquisition, legal status and independent housing plays an important role in improving the life satisfaction of refugees. In addition, progress towards integration measured by legal status, labor market participation and language acquisition have a positive impact on self-rated health, while the effect of independent housing is less strong. Similar results were reported in a large strand of literature focusing on the role of postmigration factors in shaping the life satisfaction and self-rated health of the refugee population. Previous studies have stressed integration policies in host countries as a fundamental factor in fostering the well-being of refugees (e.g., Tip et al., 2019; Walther et al., 2020; Jaschke and Kosyakova, 2021). Correspondingly, such policies should not neglect the impact of past traumatic experiences on refugees' health and well-being; thus, health care services in host countries should be designed to meet the needs of these populations (Gerritsen et al., 2006b; Mölsä et al., 2014; Jaschke and Kosyakova, 2021). In addition, our dynamic models indicate improvements in self-rated health and life satisfaction with decreases in refugees' postarrival stress factors by means of improved

language proficiency or economic integration. Accordingly, policymakers should direct their efforts towards policies that are particularly productive for fostering refugees' integration processes into the labor market and society of the destination country. Finally, our findings raise questions about the lasting effects in the self-rated health and well-being of refugees of the policies implemented to foster independent housing, labor market incorporation, and language acquisition. Future research should address the role of social networks in mediating the tapering-off of the positive effects of these interventions. Nevertheless, further evaluations are necessary to support causal interpretation of the observed association.

Our study did not examine more homogenous subgroups, for instance, by gender or education. Additionally, we have to consider that the refugees addressed in this study came from rather heterogeneous country-specific and cultural backgrounds. In addition to differences regarding the origin of the refugees, we must admit that the variance within the key explanatory variables was limited. On the one hand, the granting of legal status, at least for the Syrian group, occurred mostly in advance of the first interview, while integration into high-level education (such as apprenticeship training or academic studies) or significant jobs occurred at moderate levels even 4 yr after the refugees' arrival. These transitional steps seem to require a longer setup time, as expected at the beginning of the period of refugee influx into Germany.

DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: This article uses the factually anonymous data of the IAB-BAMF-SOEP Survey of Refugees, waves 1–4. The IAB-BAMF-SOEP Survey of Refugees in Germany is a representative longitudinal survey conducted jointly by the Institute for Employment Research (IAB) in Nuremberg, the Research Centre on Migration, Integration, and Asylum of the Federal Office for Migration and Refugees (BAMF-FZ) and the German Socio-Economic Panel (SOEP) at the DIW Berlin. Data access was provided *via* a Scientific Use File supplied by the Research Data Centre (FDZ) of the German Federal Employment Agency (BA) at the Institute for Employment Research (IAB). DOI: 10.5684/soep.iab-bamf-soep-mig.2019. All documentation concerning the IAB-BAMF-SOEP Survey of Refugees and including questionnaires and data manuals are made available by the FDZ (https://fdz.iab.de/en/FDZ_Individual_Data/iab-bamf-soep.aspx) and DIW (https://www.diw.de/sixcms/detail.php?id=diw_01.c.814095.en). Due to the German Data Protection legislation, we cannot make the original data from the IAB-BAMF-SOEP Survey of Refugees or the dataset we generated available. Researchers can however apply for data access *via* the FDZ or DIW. The computer code for the analysis is available at https://osf.io/tc3sn/. Requests to access these datasets should be directed to https://fdz.iab.de/en/FDZ_Individual_Data/iab-bamf-soep.aspx.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. The authors are listed in alphabetical order.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsoc.2021.693518/full#supplementary-material

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frontiers in Human Dynamics

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Why Are Newcomers so Happy? Subjective Well-Being of First-Generation Immigrants in Germany

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First-generation immigrants are surprisingly satisfied with their life compared to the local population in Germany. Is this because newcomers are particularly resourceful? We test if personality selectivity, purposive adaptation, and social resilience separately or in tandem explain why subjective well-being remains high even in times of objective disadvantage. Using German panel data (GSOEP) from 5,008 first-generation immigrants for the years 1984–2014 and official data, growth curve models show that newcomers are a selected group with respect to their open and less neurotic personalities and that these personal characteristics are distinctly associated with happiness. Also, newcomers immediately compare their income to the standards in the host society but not their family life. This contributes to boosting their subjective well-being as well. For more than 30 years, first-generation immigrants use their country of origin as a reference point thus protecting the positive association of intimate relationships and happiness. Finally, newcomers are highly capable of recovering from social loss. Since the resources used by first-generation migrants to preserve their subjective well-being are unlikely to be confined to Germany, our findings can inform policy-making. Most importantly, they suggest that the economic integration of newcomers should be fast and easy while family reunification and integration should follow only with a time lag.

Keywords: subjective well-being, resilience, adaption actions, migration, personality, selection, immigration

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CONTRIBUTION TO THE FIELD

The article adds to the growing and important research on subjective well-being of first-generation international immigrants. It shows that the relationship need not be negative: migrants can actually be happier than the local population. Rich panel data and advanced statistical models allow disentangling pre- and post-migratory processes. The main innovation is to address personality selectivity and to identify two additional social mechanisms—purposeful adaptation and social resilience—that enable resourceful migrants to lead a satisfying and happy life after entering the host country. All mechanisms work together but with different dynamics. Policy-making should take note of the different clocks of adaptation and speed up economic integration relative to family reunification.

INTRODUCTION

In times of worldwide rising numbers of international migrants, this article asks if, when and why newcomers may be happier than the host population? Happiness is not a luxury good but as more

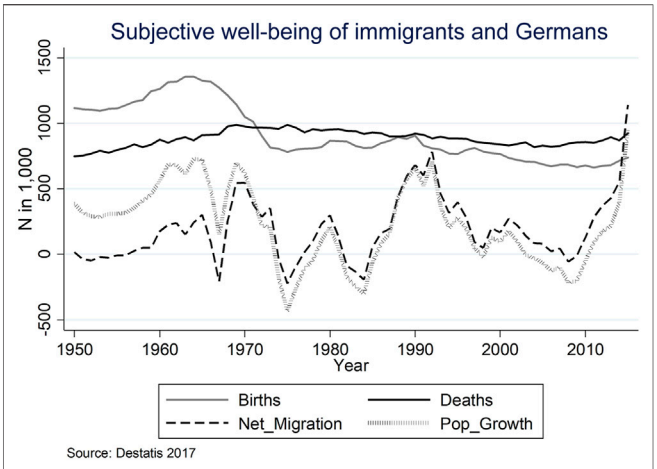

FIGURE 1 | Subjective well-being of immigrants and Germans.

and more research on subjective well-being (SWB) or happiness shows a universal goal and a proximate determinant of behavior. Happy migrants may also be perceived as a population resource and not as a societal burden as they assimilate successfully and stay longer in host countries (Shamsuddin and Katsaiti 2020). A first pooled snapshot of the subjective well-being of immigrants, aliens, and naturalized, as well as ethnic German re-settlers shows comparably high levels of happiness in Germany (**Figure 1**).

The data is based on a representative sample of panel data from 1984-2014 and includes 35 different nationalities. In this study, Germany, one of Europe's largest non-traditional immigration countries, serves as a test case. Germany's population is (comparably) rich and old, its fertility is one of the lowest in the world, and population growth depends on positive in-migration since decades (**Figure 2**). Migrants come in waves and with diverse ethnic backgrounds. In the future, all European and other advanced countries will likely follow this demographic pattern.

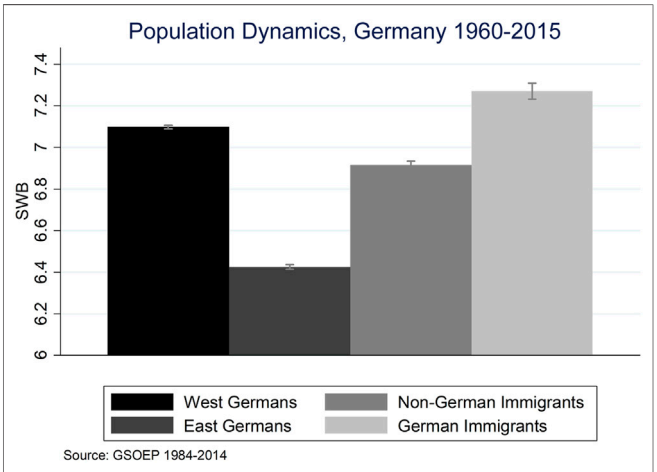

FIGURE 2 | Population Dynamics, Germany 1960–2015

The article adds to the emerging literature on the subjective well-being of migrants (e.g., Angelini et al., 2015; Helliwell et al., 2018; Hendriks and Bartam 2019; Olgiati et al., 2013). In this literature, it is still far from clear to what extent and when the happiness of migrants depends on the same factors as the happiness of the local population. Given the persistent legal, economic, and social disadvantages immigrants face (Dancygier and Laitin 2014; Heizmann and Boehnke 2018; Leopold et al., 2017), most studies show much lower levels of subjective well-being among newcomers than among natives, particularly in Europe where in-migration is a historically new phenomenon and right-wing xenophobic movements are widespread (e.g., Bălțătescu 2007; Safi 2010; Kóczán 2016). Experimental evidence from Tonga and New Zealand also suggests that migration causes unhappiness (Stillman et al., 2015). On the other hand, better (mental) health and lower subjective expectations are factors that could boost the satisfaction and happiness of migrants despite objective discrimination (e.g., Erlinghagen 2011; Melzer, and Muffels 2017).

This article tests how three possible mechanisms affect the subjective well-being of migrants simultaneously and over a decade-long time horizon. The first explanation focuses on the (largely inherited) personality of first-generation immigrants. In contrast to natives, immigrants have been able and (often) willing to leave their former lives and countries behind. Perhaps as a result (voluntary), migrants have a personality that is on average better equipped for a happy life.

The second explanation considers international migration as a long-lasting process during which migrants make many choices. Being part of two cultures provides immigrants with options for choosing reference standards that the domestic population lacks. They may have an improved capacity to assess circumstances differently, and to compare downwards, hence increasing their happiness.

The third explanation refers to social resilience resulting from the migratory experience itself. The long journeys immigrants make to reach their destinations and start their new life is often fraught with danger and stressful. Also, first-generation immigrants cannot make effective use of their skills which puts them at a higher risk than the local population of losing income, social status, and employment. But experiencing stress and loss may have a strengthening effect.

All three mechanisms (selection, adaptation, resilience) are well established in the literature but have never been analyzed jointly.

Comparing the three mechanisms systematically, this study can quantify the importance of each of them as well as their joint contribution to the happiness of newcomers. Conceptually, it provides a richer understanding of the resources used in the newcomers' pursuit of happiness. Selectivity with respect to personality has been hardly studied by social scientists. This is a serious shortcoming as neurotic personality traits are a strong determinant of unhappiness and a risk factor for all psychopathologies (Rosenström et al., 2019). Also, rich data and growth curve models reveal different timing and comparison strategies with respect to income and household composition and a certain resilience of newcomers. Lawmakers should and can make use of these insights.

The rest of the article is structured as follows. In the next section, we review the literature on migration and SWB and derive the three potential explanations for the happiness of immigrants. The *Methodology* section introduces the research design. The *Findings* section presents the findings. The *Discussion* section places the results into the broader framework of subjective well-being and migration research and discusses their political implications.

BACKGROUND

Measuring Happiness

The terms happiness, SWB, or life satisfaction are often used synonymously in the social sciences (Frey and Stutzer 2002; Easterlin 2003; Veenhoven 2008) and refer to the subjective evaluations of life as a whole. In order to evaluate the quality of their personal lives, people draw on emotional and cognitive information. Psychologists often treat emotions and cognitions as separate components of well-being (Diener 1984; Diener, 2013) and translate them into multi-item, multi-dimensional happiness scales (Ryff 1989; Hills and Argyle 2002). However, such complex measures are often criticized for being unclear and potentially invalid (Cummins 2013).

Demographers, economists, political scientists, and sociologists have a more pragmatic view of the concept. Assuming that global judgments of life rest on a "cognitive comparison with standards of the good life (contentment) and affective information from how one feels most of the time (hedonic level of affect)" (Veenhoven 2008), social scientists usually limit their measurement to one or two straightforward questions that are easy to ask in large representative surveys. Globally, one-item measures have been shown to be reliable and valid across social and cultural contexts (Lyubomirsky and Lepper 1999; Diener et al., 2013). Non-response rates are remarkably low in all countries (Veenhoven, 2010). Moreover, life satisfaction correlates highly with other elements of well-being like rapports with friends, plausible objective circumstances, external events, or comprehensive behavioral consequences of well-being, as well as physiological measures like levels of cortisol and brain activity (Layard 2010). This makes SWB a promising measure for migration research.

Personality Selection

The high average level of subjective well-being of immigrants in Germany is puzzling given the formal disadvantages of noncitizens (Bloemraad et al., 2008), informal discrimination of ethnic minorities (Pettigrew 1998; Skrobanek 2009), and generally lower socioeconomic status (Granato and Kalter 2001; Constant and Massey 2005). Selectivity is one potential explanation. However, empirical evidence is mixed. Research on migration and happiness has shown that people with lower life satisfaction decide to leave their home country (Graham and Markowitz 2011; Migali and Scipioni 2019). In contrast, according to the healthy migrant hypothesis, immigrants tend to have significantly lower morbidity and mortality rates than the local population in many host countries (Rubalcava et al., 2008; Bostean 2013; Guillot et al., 2018). Better health is a strong predictor of happiness.

To explain this apparent inconsistency, it is important to conceive migration as a risky endeavor and happiness as a decision-making aid. People considering to leave their country have to evaluate these risks: feeling very unhappy and dissatisfied with current living circumstances and anticipating a better life abroad lowers the risk to migrate (Heitmueller 2005); being healthy and resourceful further decreases the dangers to break with one's former life and to resettle in a new environment (Bhugra 2004). For this reason, unhappy but healthy people may self-select into migration.

Neither unhappiness nor health are steady states. But individual-level health and happiness data prior to migration are missing. Thus, the article focuses on personality traits which highly correlate with mental health, are (largely) determined early in life, and associated with the happiness of people. Research suggests that open and extroverted personalities are more likely to emigrate (Jokela 2009; Canache et al., 2013). In addition, people who voluntarily leave their country should be less neurotic as they suffer less from migration stress and mental disorders when they are optimistic, actively plan the transition, and have a realistic perception of post-migration difficulties and social support (Mahonen and Jasinskaja-Lahti 2013). In contrast, refugees who were forced to migrate are less selected on specific personality traits but often share traumatic experiences. They usually have higher rates of mental illnesses and suicidal tendencies (Hansson et al., 2012; Matanov et al., 2013).

Since personality traits are substantially inherited (Jang et al., 1996; McCrae and Costa 1997), similar across countries—according to Kajonius and Giolla (2017), national differences account for only 2% of the variance in personality traits—and strong predictors of SWB—particularly neuroticism and extraversion (DeNeve and Harris 1998; Keyes et al., 2015)—we use them to capture and compare the mental health selection of newcomers to locals. Moreover, selective out-migration of those with poorer mental and physical health and lower life satisfaction can further bias the migrant population positively ("salmon bias", i.e., Abraido-Lanza et al., 1999; Shamsuddin and Katsaiti 2020).

Thus, our first hypothesis states that voluntary migrants are more extroverted and less neurotic personalities compared to the host population which increase SWB.

Purposive Adaptation

Migration is a process. It involves gradual acculturation and assimilation, often stretching over generations (Nauck 2001; Alba et al., 2002). From an economic angle, this adaptation is costly. As (most) standards are defined by the majority in the host society, migrants as a minority are at a disadvantage. Particularly at the time of arrival, migrants usually lack transferable human capital, have smaller social networks, and earn significantly lower incomes (Büchel and Frick 2005; Hall and Farkas 2008). But their happiness appears to be little affected by this negative socioeconomic stratification in comparison to the native reference group (Obucina 2013).

Social benchmarks against which individuals evaluate their current life situation are important cognitive mediators between

objective conditions and subjective well-being. Easterlin (1974) first showed that individual happiness remained unchanged within the US for decades despite a steady increase in national wealth and despite a positive relationship across countries (Easterlin et al., 2010). Drawing on the relative income hypothesis (Duesenberry 1949) and the theory of social reference groups (Stouffer 1949; Merton 1968), Easterlin explains the paradox by the zero-sum game of social status acquisition. In an environment where everybody gets richer, SWB stagnates since comparative standards and aspiration levels rise. Along this line, migration research has shown that hedonic adaption may lower the happiness levels of newcomers. Triggered by higher standards of the host society, subjective expectations and aspirations often rise quicker than objective living circumstances (Hendriks and Burger 2020) and can turn newcomers into "frustrated achievers" (Graham and Markowitz 2011).

But adaptation is not automatic. Relative income is an important determinant in the entire SWB literature (Stutzer 2004; Clark et al., 2008; Gokdemir and Dumludag 2012). Most economists and sociologists assume that comparative standards are exogenously imposed by spatial or social proximity—neighbors (Luttmer 2005; Firebaugh and Schroeder 2009), colleagues and friends (Clark and Senik 2010), people of the same age and sex (Perez-Asenjo 2011), or general regional standards (Wolbring et al., 2013).

Yet, social psychologists propose that people search actively for comparison groups in order to boost their subjective well-being (Diener and Fujita 1997). People with similar values and social status are more likely to be relevant to each other. Falk and Knell (2004) show that gender and academic achievement play important roles when choosing "the Joneses". Since relative deprivation is also a driver to leave one's country (Stark and Taylor 1991), we should expect that concerns for social comparison survive in first-generation migrants.

For migrants, picking the "right pond" (Frank 1985) is an opportunity to engage in selective comparison. Having access to different ways of living in different countries, migrants can control if, when, and how they want to belong and blend into the mainstream of the host society. Research on segmented assimilation (Portes and Zhou 1993) and selected acculturation (Portes et al., 2009) shows various pathways in which migrants adapt to their new environments. A deliberate preservation of the community culture and traditional values of the home country accompanied by an economic integration into the host society seems to produce very successful outcomes such as high academic achievement (Jimenez and Horowitz 2013), high income (Reitz et al., 2011), and higher life satisfaction (Angelini et al., 2015).

Drawing on these findings, we hypothesize that migrants pursue purposive adaptation strategies to preserve happiness despite hardship. In doing so, they may evaluate opportunities differently because they compare themselves to other social standards than the native population. More specifically, we hypothesize that they focus on economic integration first and on social integration at a significantly later stage.

Social Resilience

Psychologists and psychiatrists have shown that migration is a stressful experience (Bhugra 2004; Breslau et al., 2007). Starting a new life in a new country increases the risk of adverse events like income loss, unemployment (OECD 2012), and partnership dissolution (Frank and Wildsmith 2005; Boyle et al., 2008). Can migrants better cope with many negative events because of their experiences of doing without former amenities and old consumption, work, or social habits? For unemployment, there is empirical evidence that they may not (Leopold et al., 2017). But is this also true for income loss or the loss of social support?

The concept of social resilience (Hall and Lamont 2013) provides plausible arguments and supportive evidence for how people remain healthy and happy under conditions of adversity. Introduced first in ecological and disaster research and in developmental psychology, resilience describes strong responses of (psychological) systems to negative external events. The term social resilience refers to "an outcome in which the members of a group sustain their well-being in the face of challenges to it." (Hall and Lamont 2013) Securing a favorable material, symbolic or emotional outcome is more than adaptation or a return to a previous state. It is also more than exploiting one's resources and encompasses "significant modifications to behavior or to the social frameworks that structure and give meaning to behavior" (ibid.). The focus on social resilience does not interfere with genetically determined stress responses. Social resilience grows from social relationships as they create "the willingness of people to turn to others for help" and assure "the likelihood it will be supplied" (Hall and Taylor 2009, 91). Migration research highlights the importance of networks for newcomers. Ties to other migrants are one of the strongest predictors of going abroad and settling at a specific destination (Levy and Wadycki 1973). Migration networks constitute social capital as they lower transaction costs and generate higher incomes (Amuedo-Dorantes and Mundra 2007). Ethnic economic enclaves (Portes and Bach 1985) are network economies which absorb newcomers and equip them with better income prospects (Portes and Shafer 2007). Also, assimilation processes run through family ties (Diefenbach et al., 1997).

Against this background, migrants who seek support from intimate partners or fellow migrants should receive more tailored information and more adequate help when they face a crisis. Shared experiences are also the basis for collective identities, moral meaning, and a migration culture. We know that migrants and other marginal groups are more resilient when they preserve a minority culture (Sellers et al., 2003; Lamont 2009). Inferring from these findings but narrowing the perspective on stressful events during the purposive (non) adaptation processes, we hypothesize that the SWB of migrants will be less affected by income and partner loss than the local population. The migratory experience has made them more resilient and better able to recover from adverse economic and social events.

METHODOLOGY

Data

The analysis is based on German Socio-Economic Panel data (SOEP) from 1984 to 2014 (Version 31, SOEP 2014; doi: 10.5684/

TABLE 1 | Pooled SOEP samples A-D 1984–2014.

	First-generation immigrants	West Germans
	N	
Sample	5,008	14,603
Nationalities[a]	35	1
Women	2,363	7,462
	Mean observation years (std)	
Subjective life satisfaction (0 completely dissatisfied to 10)	7.0 (1.91)	7.1 (1.82)
Big 5 (sum of 3 items for each trait)		
(1 does not apply at all to 7)		
Openness	12.5 (3.85)	13.3 (3.59)
Conscientiousness	17.7 (2.80)	17.4 (2.86)
Extraversion	14.0 (3.45)	14.4 (3.41)
Agreeableness	16.5 (3.01)	16.1 (2.91)
Neuroticism	12.1 (3.55)	11.7 (3.65)
Age in years	43.2 (14.70)	45.6 (17.86)
Age at immigration	22.8 (12.18)	
Years in panel	17.2 (8.46)	19.7 (9.07)
Health satisfaction (0 completely dissatisfied to 10)	6.7 (2.38)	6.6 (2.30)
Household size	3.6 (1.74)	2.8 (1.28)
Household (net equivalent) income inflation adjusted €	3,300.7.8 (1859.9)	3,607.9 (2,329.5)
Personal (Net) income inflation adjusted €	680.0 (751.7)	785.2 (993.9)
Years in education	9.82 (2.23)	11.5 (2.46)
	% pooled observation years	
Marital status	69.5	46.1
Married		
Single parent	3.9	6.0
Residence status	4.1	
Asylum seeker		
Employment status	7.5	3.1
Unemployed		
Not employed	19.8	12.0

[a]*Restricted to cases with 30 or more observations.*

soep.v31). We use samples A to D which provide representative data for the West German native and foreign resident population since 1984 (Wagner et al., 2007). The sample includes 35 countries of origin. Most migrants came from Turkey (1.441), former Yugoslavia (720), Italy (659), Greece (483), and Spain (408). Also, East Europeans are numerous (Poland 315; Russia 161; Kasachstan 131). Years of immigration range from 1949 to 2012. Few arrived before 1960 (2.5%), during the 1960s this number increases to 27.4%, and during the 1970s to 66.7%. Another huge intake occurred during the reunification years (1989 5.2%, 1990 4.1%, 1991 3%). Since 1994, only 2.3% of all interviewees have arrived. The average age at migration is 23 years. The analysis focuses on first-generation immigrants and on variables that have been asked yearly since 1984. We delete cases with yearly missing values and countries with fewer than 30 observations. Only values from personality traits which are measured three times in the panel are copied into (nearest) gap years.

Measures

Dependent Variable

Life satisfaction: Since 1984, people in the SOEP have been asked: "How satisfied are you with your life, all things considered?" Answers are measured on an 11-point scale ranging from completely dissatisfied (0) to completely satisfied (10). This question has been widely used in the economic and sociological literature.

Explanatory Mechanisms

Selection: We measure personality selectivity (into the country) and draw on the Big five personality measures. Personalities develop early in life. They might be largely genetically inherited (Jang et al., 1996; Loehlin et al., 1998). Usually, they are relatively stable across time even if more recent findings report also changes (Specht 2017), and they are universal.

To account for out-selection, the "salmon bias", we interact retention time in the panel, health satisfaction during the last interview, and the difference between the mean health satisfaction and last health satisfaction with migration status.

Purposive Adaptation: Absolute and relative net household and personal income (after taxes and transfers and adjusted for inflation and household size) and interaction with migration status measure economic adaptation. Relative income refers to the difference between own income in comparison to average income either of the average local, the same national reference group or of the same age, sex, educational, and national peers. We

also add an interaction of these income measures with time since immigration to account for the process of adaptation.

Beyond material wealth, we use private and family living arrangements (marital status, household characteristics) to better account for the multi-dimensionality of the adaptation process. We also apply absolute and relative measures to capture both the personal status and the deviation from the mean probability of this status of the respective average local, national or same age, sex, educational, and national reference group.

Social Resilience: We measure the responsiveness of migrants to loss experiences from two points of view. Economically, we focus again on household and personal income. With respect to the family network, we use the loss of a partner. We trace the after effects over more than 3 decades and compare them with same-aged natives.

Controls: Age, current health status measured by the number of doctor visits during the last 3 months, years in education, gender, religiosity, occupational status as non-employed and unemployed, and asylum seeker status are controlled in this analysis as they have been shown to influence happiness and life satisfaction (Layard 2010). Yearly dummies control for periodic trends. **Table 1** shows the descriptive statistics.

Models

The analysis is based on a growth curve model within a multilevel framework to disentangle the effects of individual changes and social processes from persistent personal and cultural characteristics (Yang 2008; Snijders and Bosker 2012). A full 3-level model suits the data best given substantive considerations (identification of personal and national differences across time) and goodness-of-fit statistics (significantly declining likelihood values, decreasing Bayesian information criterion (BIC) (see **Appendix**)). Our model has the following general form:

$$y_{tjk} = \beta_{000} + \beta_{100}x_{tjk} + \ldots + \beta_{010}z_{0jk} + \ldots + \beta_{001}c_{00k} + \ldots + \beta_{n00}x_{tjk}z_{0jk} + \tau_{00k} + \tau_{10k}x_{tjk} + \vartheta_{ojk} + \vartheta_{1jk} + \varepsilon_{tjk}$$

where y_{tjk} stands for the life satisfaction at time t $(t = 1, \ldots, N)$ nested within person j $(j = 1, \ldots, M_t)$ and country $k(k = 1, \ldots, L_{tj})$. β_{000} represents the intercept, β_{100} exemplifies a fixed coefficient for a first level time-varying variable, β_{010} exemplifies a fixed coefficient for a second level personal variable, β_{001} exemplifies a fixed third-level country variable, and β_{n00} captures coefficients for first and second level interactions. The model further includes a random intercept and a random slope at level three τ_{00k}, τ_{10k}, as well as a random intercept at level two ϑ_{0jk}. ε_{tjk} is the level one error term. Multilevel models assume that all random terms are normally distributed $N(0, \Psi)$ with pairs of random effects $(\tau_{00k}.\tau_{10k})$ being independent and identically distributed. The random error terms ε_{tjk} are also independent and identically normally distributed $\sim$ i.i.d.$N(0, \Theta)$. All models are estimated by maximum likelihood and with STATA 16.

FINDINGS

Personality Selection

Endowed mental strength predicts the subjective well-being of immigrants. Please note that # indicates an interaction. As **Table 2** shows, the model fit increases from 6.6% (controls only) to 29.1% explained variance when accounting for mental health in-selection and health out-selection in model 2. Nearly 6.1% of the variance is explained by including individual random slopes for all personality traits (Snijder and Bosker, 1994; Snijder and Boske 2012).

TABLE 2 | Personality selection and happiness.

	(1)		(2)	
Fixed effects				
Immigrant (yes/no)	0.14 (0.06)	*	ns	
Big 5-personality traits			0.03 (0.01)	**
Openness				
# Immigrant			0.06 (0.02)	*
Conscientiousness			0.04 (0.01)	***
# Immigrant			– 0.04 (0.02)	†
Extroversion			0.07 (0.01)	***
# Immigrant			– 0.08 (0.02)	***
Agreeableness			0.05 (0.01)	***
# Immigrant			ns	
Neuroticism			– 0.13 (0.01)	***
# Immigrant			0.07 (0.02)	**
"Salmon Bias"				
Years in panel			– 0.02 (0.00)	***
# Immigrant			0.01 (0.00)	†
Health satisfaction (HS) last interview			0.50 (0.01)	***
# Immigrant			ns	
Difference last and mean HS			0.50 (0.01)	***
# Immigrant			ns	
Controls				
Log net household income	0.37 (0.01)	**	0.35 (0.01)	***
Married	0.24 (0.01)	***	0.25 (0.01)	***
Random effects (variance)				
Nation	0.02 (0.01)		0.01 (0.01)	
Person	1.11 (0.02)		0.30 (0.01)	
Openness			0.07 (0.01)	
Conscientiousness			0.08 (0.01)	
Extroversion			0.06 (0.01)	
Agreeableness			0.07 (0.01)	
Neuroticism			0.07 (0.01)	
Residual	1.73 (0.01)		1.66 (0.01)	
Number of observations	128,638		128,638	
R^2 (%)	6.6		18.6	
Log-likelihood	–226,326		–223,050	

Note: All models include year dummies and control for age, age at immigration, sex, current health, education, religion, residence status, unemployment; standard errors in parentheses; †p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001.

All Big 5 measures are significantly associated with life satisfaction. But newcomers deviate significantly from the local pattern. Being extrovert or conscientious is no source of happiness for immigrants, as interactions cancel the positive main effects out. However, being open and less neurotic are important traits which immigrants can significantly better exploit to increase their subjective well-being. An increase by one standard deviation on the openness scale raises the subjective well-being of newcomers by 9% in comparison to 3% among the local population. Similarly, the stark negative effect of neuroticism on life satisfaction is weaker among newcomers. An increase by one standard deviation lowers the subjective well-being of newcomers by 6% compared to 13% among Germans. As

newcomers are on average less open and more neurotic, we decompose these effects (Jann, 2008). In the counterfactual case, if immigrants would have the same levels of openness and neuroticism as the local population, their subjective well-being would significantly rise further (Oaxaca decomposition: openness 14% z = 7.81, $p < 0.000$; neuroticism 2%, z = 3.75, $p < 0.000$).

In contrast, we do not find a positive out-selection of healthy newcomers. To identify out-selection and to distinguish it from panel mortality, we add panel retention time, health satisfaction during the last interview, and the difference between average and last health satisfaction to the model. While the subjective well-being of newcomers is less negatively affected by each additional year in the panel than natives are, we find neither a systematic difference between both groups with respect to health satisfaction at the end of their panel participation nor with respect to the difference between their last and mean health satisfaction. Hence, there is no evidence for a "salmon bias" in the data.

In sum, we find personality selectivity among first-generation migrants. Accounting notably for neuroticism and openness improves the model fit substantially. Importantly, the influence of income and marital status on subjective well-being is unaffected by personality selectivity. We test if they are an additional particular source of happiness for newcomers.

Purposive Adaptation

Income

Most variance in life satisfaction accrues at the person and year levels, where adaptation processes take place. We focus on household and personal income first and test whether absolute and relative incomes have different impacts on the life satisfaction of migrants and native Germans (**Table 3**).

Model 3 adds to model 2 the effects of absolute household and personal income. The results show that household income is the strongest income determinant of SWB. A 100 (1,000) € increase in net household income raises the SWB of immigrants by 0.6 (0.9) points on the 11-point scale compared to 0.7 (1.1) points among Germans. Immigrants also value personal income favorably even though the substantive effect is minuscule 0.02 (0.03) points for 100 (1,000) €.

Models 4–6 test the influence of relative income. Using the difference between individual and mean income of the German subpopulation (model 4) fits the data better than the income difference to conationals from migrants' home countries (model 5) or of groups broken down by ascribed and meritocratic differences related to nationality, age, gender, and education (model 6). But the differences are small. In fact, absolute and relative income fits the data nearly equally well. Moreover, the income of the native population is the most relevant yardstick to which newcomers compare themselves and derive their subjective well-being. Income deviations from the mean are also measured on a log scale. On average, newcomer households earn 309 € less than German households which would—ceteris paribus—lower their SWB by nearly one point (0.8) on the 11-point SWB scale. Finally, we combine absolute and relative income in model 7, but to control for multicollinearity, we only add the interactions of relative household and personal income (compared to the German reference group). The log-likelihood ratio test confirms a significant improvement ($\chi^2_{(2)} = 22.20$; $p < 0.000$) compared to model 3 and testifies that newcomers seem to devalue their absolute income and make use of German benchmarks for their personal income. This selective adaptation and social sensitivity allow newcomers to preserve subjective well-being despite material disadvantages. It may also speed up the economic integration. To control for endogeneity, a model estimation with lagged income variables confirmed the pattern. Even in the presence of model misspecification, robust error estimates validated *p*-values and CIs.

TABLE 3 | Purposive adaption: Income.

	(3)		(4)		(5)		(6)		(7)	
Household net equation income (HI) (*in* log *2010* €)	0.36 (0.01)	***							0.36 (0.01)	***
# Immigrant	−0.05 (0.03)	†							−0.11 (0.05) **	**
Personal net labor income (PI) (*in* log *2010* €)	−0.01 (0.00)	**							−0.01 (0.00)	***
# Immigrant	0.02 (0.00)	***							0.41 (0.08)	***
Difference to mean			0.36 (0.01)	***						
German HI										
# Immigrant			ns						ns	
German PI			−0.01 (0.00)	**						
# Immigrant			0.02 (0.00)	***					−0.39 (0.10)	***
National HI					0.36 (0.01)	***				
# Immigrant					ns					
National PI					−0.01 (0.00)	**				
# Immigrant					0.02 (0.00)	***				
HI of the same nation, age, gender, education							0.33 (0.02)	***		
# Immigrant							ns			
PI of the same nation, age, gender, education							0.01 (0.00)	**		
# Immigrant							ns			
Log-likelihood	−223,035		−223,038		−223,040		− 223,221		−223,009	
N	128,638		128,638		128,638		128,638		128,638	

Note: All models build on model 2; standard errors in parentheses; †p < *0.1,* *p < *0.05,* **p < *0.01,* ***p < *0.001.*

Income Dynamics

We follow the marginal effects of absolute and relative income across time to get a better understanding of how the mechanism of purposive adaptation works. **Figure 3** shows divergent patterns for both income effects and for both groups. Comparing the two rows, we see that relative income tends to develop a stronger (positive and negative) impact on the subjective well-being of migrants than of Germans. Grouping immigrants by years lived outside, and in Germany, we can compare their response directly to the response of same-aged Germans. We follow both groups from the age of 25–60 years. Note the different *x*-axis for newcomers, and Germans account for the same age and/or time length lived in Germany

Apart from absolute household income (first left picture) which has no systematic influence on the subjective well-being of newcomers, all other marginal effects show first-generation immigrants to be more responsive to income quantities than the local population. This does not mean that newcomers are generally more materialistic. On the contrary, they even devaluate personal income in relative terms over the years. But more importantly, relative household income which is a social status marker of the host society becomes associated with the happiness of newcomers more strongly than with that of Germans. Immigrants choose to compare their income status to the local population and thrive by it. With respect to household income, more discrepancy correlates with more happiness over time; with respect to personal income, deviations from the German are negatively associated with SWB and likely trigger a search for happiness elsewhere. This social responsiveness is a mechanism that fuels economic adaptation.

Family Life

Adaption looks different when we compare the private lives of natives to newcomers. We repeat the foregoing analysis for family status while controlling for all effects of the previous best-fitting model 7 (**Table 4**). Using single parenthood, being married and household size as three decisive indicators of family networks reveal significant differences between first-generation immigrants and the local population. As expected, being a single parent predicts a significant lower level of subjective well-being in both groups but more so among newcomers ($\beta = -0.323$; $\beta = -0.196$). Moreover, the negative effect of single parenthood increases when the comparative standard is conationals from the immigrants' countries of origin (model 10). However, the predicted decrease in subjective well-being is lower for single parenthood when the benchmark is derived from a population of the same age, sex, education, and national background as the interviewee ($\beta = -0.192$; model 11).

Having a marriage partner is a significant plus in absolute and relative terms. The effect sizes hardly differ in models 8–10. But the predicted values for newcomers are significantly lower than that for Germans. This association disappears in model 11. A comparison with the narrower same age, sex, education, and national reference group discloses only an overall lower but still

TABLE 4 | Purposive adaption: Family status.

	(8)		(9)		(10)		(11)	
Single parent (reference: no single parent)	−0.20 (0.03)	***						
# Immigrant	−0.13 (0.07)	†						
Married (reference: non-married)	0.23 (0.02)	***						
# Immigrant	−0.08 (0.04)	*						
Household size	ns							
# Immigrant	ns							
Difference to mean (prob.) of German single parents			−0.20 (0.03)	***				
# Immigrant			−0.13 (0.07)	*				
German married couples			0.23 (0.02)	***				
# Immigrant			−0.08 (0.04)	*				
German household size			ns					
# Immigrant			ns					
National single parents					−0.20 (0.03)	***		
# Immigrant					−0.14 (0.07)	*		
National married couples					0.23 (0.02)	***		
# Immigrant					−0.08 (0.04)	*		
National household size					ns			
# Immigrant					ns			
Single parents of the same age, gender, education, nationality							−0.14 (0.03)	***
# Immigrant							ns	
Married couples of the same age, gender, education, nationality							0.21 (0.02)	***
# Immigrant							ns	
Household size of the same age, gender, education, nationality							ns	
# Immigrant							ns	
Log-likelihood	−222,960		−222,960		−222,959		−223,212	
N	128,638		128,638		128,638		128,638	

Note: All models are based on model 7; standard errors in parentheses; †p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001.

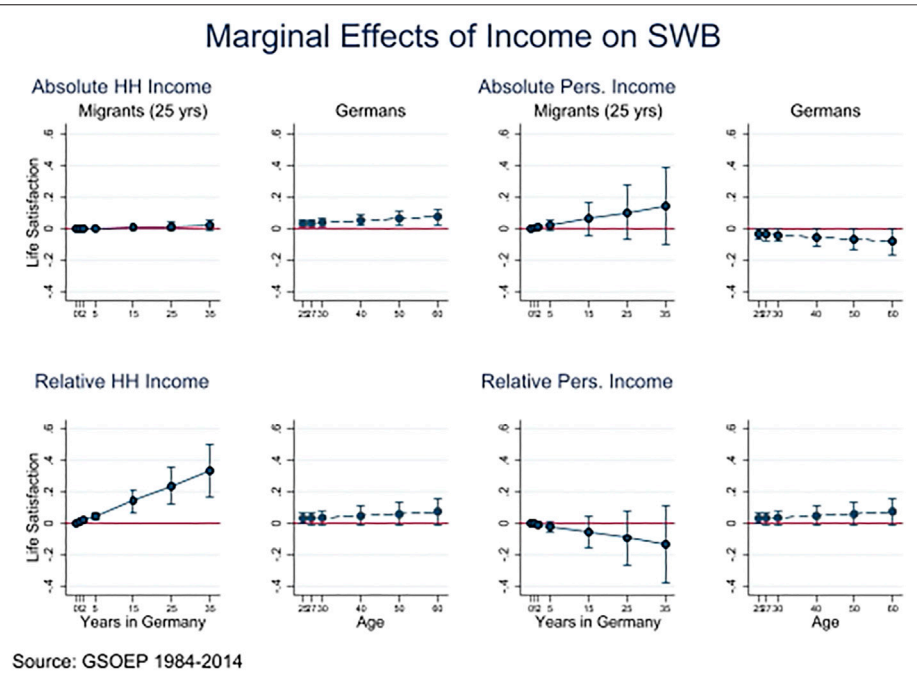

FIGURE 3 | Marginal effects of income on SWB.

significant positive association. Moreover, we do not find any evidence that household size can contribute to higher subjective well-being for any group.

Multicollinearity prohibits to include absolute and relative measures of family ties in one model. Thus, we use the best fitting model 10 which refers to diverse national benchmarks to better understand the nexus of family ties and subjective well-being as it evolves over time.

Family Dynamics

With respect to family networks and their hidden norms, newcomers seem to remain distinct over the course of an entire generation. **Figure 4** shows that effect sizes diverge from the German population across time. In fact, living as a single parent is not predicting the happiness of immigrants during the first years in Germany while raising a child alone has always a significant negative effect on the subjective well-being of same-aged locals. In later years though, single parenthood seems to impact the subjective well-being of migrants much more negatively than Germans.

Findings for marriages reveal a similar diverging trend. Across time, having a marriage partner predicts the subjective well-being of newcomers less and less positively. At the age of 60, the beneficial association is washed out. On the contrary, Germans seem to benefit steadily from a marriage partner over the entire life course. Note that we use relative differences to national reference groups. However, the results are robust with Germans as a reference group or with categorical family status indicators. Thus, newcomers preserve a unique family culture unperturbed by social comparisons and by changes across time. Finally, the persistent no-effect of household size reveals the importance of quality (not quantity) family life.

Social Resilience

Preserving cultural distinctions in the private sphere suggests a certain resilience. We finally test the social resilience of newcomers explicitly. We include household and personal income losses, as well as losing one's partner and other members in the household during the previous year, and insert these variables in model 10. **Table 5** displays the results.

Interestingly, the subjective well-being of immigrants is not particularly associated with income loss, even though their average income is significantly lower than that of the local population. A decline in monthly personal income, e.g., by 340 €, approximately 50% of their net monthly income, reduces the SWB of newcomers and locals alike by only −0.5 points on the 11-point scale. An additional recent loss of household income remains insignificant. Losing income may not qualify as a personal disaster. It is also a more gradual and reversible experience than a sudden and harmful event such as the loss of a life partner.

Research on subjective well-being has shown that the loss of a spouse has severe and long-lasting negative consequences. It leaves scars. But also, this tragic event does not predict significantly lower SWB values for immigrants than for the native population. Loosing other household members implies more diverse transitions, e.g., children or grandparents leaving the household which is often foreseeable and sometimes reversible. For these events, the resilience of migrants does even positively deviate from the overall negative trend of a sudden decline in household size.

All discrepancies support our expectation that first-generation immigrants are more socially resilient. **Figure 5** shows how

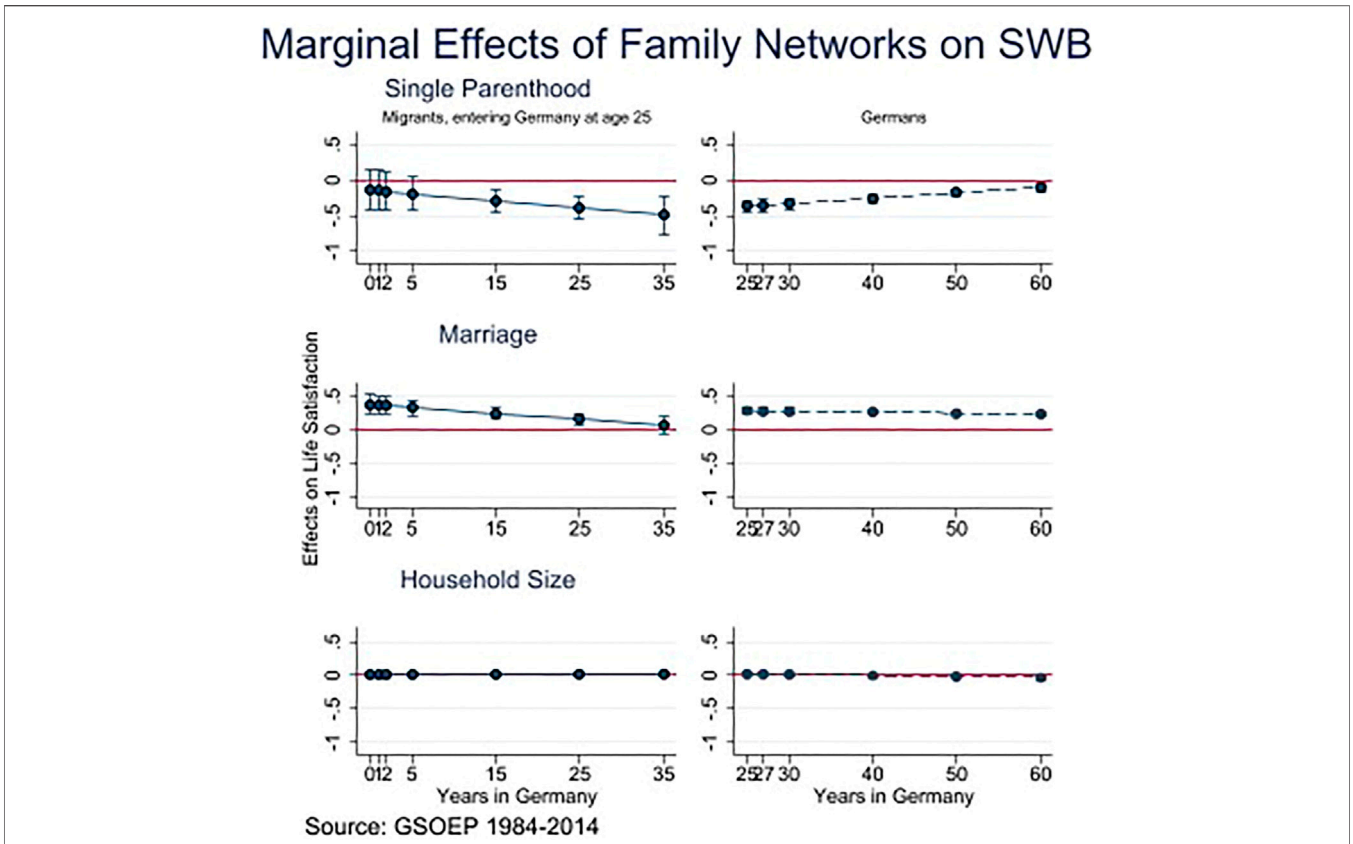

FIGURE 4 | Marginal effects of family networks on SWB.

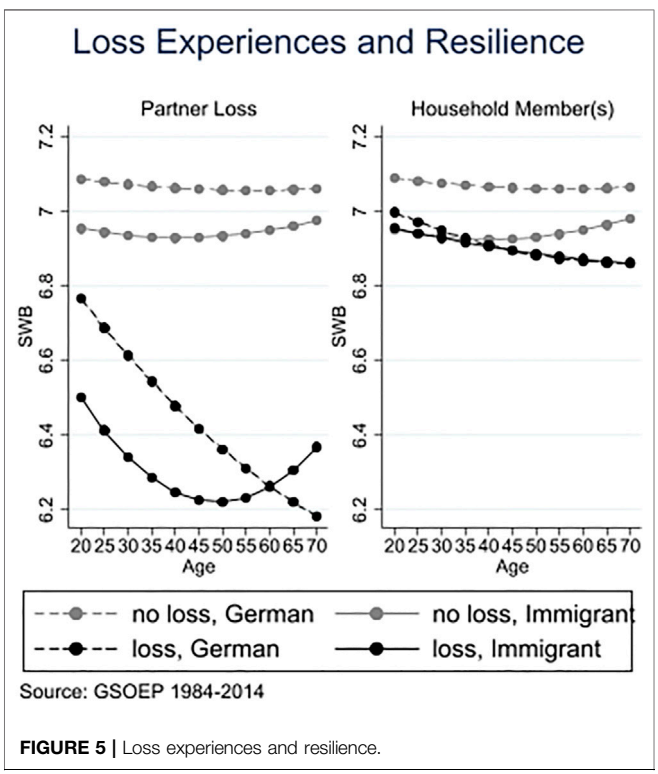

FIGURE 5 | Loss experiences and resilience.

resilience builds up and alters the predicted levels of SWB for average German and first-generation immigrants at different stages in their life course. It reveals the cumulative harm of immediate losses with age but also the strong coping capacity of 50 years and older newcomers after the loss of a partner and the less steep decline in SWB for younger newcomers until the age of 50 who lost a household member.

Still, the interplay of these various sources of happiness does not detach average newcomers from their disadvantaged objective living circumstances. During most of their lifetime, the model predicts comprehensible lower levels of subjective well-being for them than for average West Germans.

DISCUSSION

The association of migration and subjective well-being has caught the attention of social scientists (i.e., Kóczán 2016; Helliwell et al., 2018; Hendriks and Burger 2020). Our study contributes to this emerging literature and furthers our understanding of the social integration challenges associated with international migration in the pre- and post-pandemic world. For Germany, the second most popular destination country of international migrants (International Organization for Migration (IOM), 2020 27), the data show that first-generation newcomers can achieve high levels of subjective well-being compared to the local

population, irrespective of their national, legal, and cultural background. The study tests jointly three general mechanisms potentially accounting for the high level of happiness. Tracing migrants' happiness over a generation-long period of observation, we understand migrants as resourceful, purposive, and resilient actors and disentangle the different dynamics of economic and family integration.

Personality selection assumes that newcomers are different from the outset. Our panel data confirm that migrants indeed have distinct personalities compared to natives. On the one hand, they appear to be more open and use openness more effectively to gain subjective well-being. On the other hand, they inherit more often a neurotic personality but do not let it have such a detrimental effect on their happiness than it has for natives. First-generation migrants seem to better cope with anxieties, temperament, jealousy, and envy.

While it is not difficult to understand why people who are open to new experiences, imaginative, and adventurous can flourish in a new environment, it is not obvious why neurotic personalities among newcomers experience less unhappiness than among the local population. Psychologists do not provide answers for differences between social groups (Carver and Conner-Smith 2010). One possible explanation may be that new experiences in host countries are generally less stressful (or perceived as less stressful) than previous experiences in home countries, that social welfare states like Germany provide newcomers with a happy experience of welfare and quality of life (Veenhoven, 2000) and thus do not trigger (to the same extent) inherited neurotic evaluations and behaviors.

This explanation may also help to dissolve the apparent contradiction that neurotic personalities, a strong predictor of lower levels of subjective well-being, are over-represented among immigrants. The literature has shown that (aspirational) movers are unhappier than stayers (Migali and Scipioni, 2019) because people who are thinking about taking the risk of leaving to seek happiness elsewhere must have a strong motive to leave. Unhappiness is one and a neurotic person is more sensitive to unhappy cues. After migration decision has been made, neurotic newcomers benefit from the new and unknown environment so that their character may not fully play out.

Overall, personality selectivity explains 29.3% of the overall variance of the model. This is a substantial share. Yearly adaptation adds 0.5%, and social resilience with respect to the loss of an intimate partner or household member captures only 0.4% per event.

We identify adaptation as the most flexible mechanism used by first-generation immigrants to control, dose, and maintain happiness in their new host country. Income is positively correlated with the subjective well-being of first-generation immigrants. However, compared to native Germans, the association with household income is less positive and with personal income more positive. More importantly, subjective well-being is equally well predicted by absolute and relative income. The preferred comparison for immigrants is the mean income of Germans, not the mean income of migrants from their countries of origin. This responsiveness to the new economic environment drives the adaptation to German material standards. It does not necessarily imply an (unhappy) upward comparison even if immigrant households tend to earn on average less than native ones. Optimistic expectations about future income can help to relativize the current situation (Frijters et al., 2012). Marginal household income effects show a significant and growing positive association as time progresses. For personal income, absolute and relative measures work in opposite directions and largely correct an overly rosy perception of objective disadvantage. Hence, newcomers are resourceful and attentive agents and not patient sufferers of their economic integration and adaptation in Germany.

In contrast, first-generation immigrants do not benefit from comparing their private lives neither with that of the local population nor with that of people of their own national background. Only the comparison with migrants of not only the same nationality but also the same age, sex, and education do not put them at a higher risk of experiencing lower subjective well-being than the native population. This constrained comparison is advantageous as it allows immigrants to preserve a more positive influence of individual family arrangements on happiness. Indeed, we do not see any adaptation to German mainstream family networks and their norms across time, not even for the negative association of single parenthood.

The literature backs up our findings. Theories of selective acculturation (Gibson 1988) have explained how migrants acquire cultural practices of the host country selectively while largely maintaining their old culture expectations and affiliations. Migration studies have shown that private networks are absolutely (not relatively) important for newcomers (Portes 1995; Ryan et al., 2008), while research on subjective well-being has revealed the importance of relative compared to absolute income. (Easterlin 2003; Falk and Knell 2004; Wolbring et al., 2013). Understanding the choice and ignorance of social comparison as purposive adaptation strategies to preserve subjective well-being adds to both literatures as it provides a better understanding of the economic and cultural agency of newcomers.

Finally, first-generation immigrants also show social resilience. Despite lower incomes and greater responsiveness to personal and relative incomes, a recent loss in income is not associated with a greater decline in subjective well-being for newcomers than for Germans. However, they can better cope with dramatic social events. As we show, the loss of a partner affects the subjective well-being of migrants less than that of native Germans. In fact, after some time, it goes back to previous levels. Adaptation can hardly explain these resilient responses to rare and recent events. It is more likely that previous social loss experiences through migration buffer the negative effect of severe personal losses.

Here are some limitations of the study. Firstly, we do not claim causality for our findings as we cannot experimentally alter the treatment for our study population. Nevertheless, panel data allow to trace first-generation immigrants over decades, account for selectivity, test social mechanisms as they progress in time, and embed them in an ecological valid multilevel setting (Gangl 2010). On this account, we do not have to narrow our analysis down to single, often minuscule experimental effects but retrieve from the bigger picture ecological valid insights into the purposive pursuit of happiness of newcomers.

Secondly, our main data set is restricted to the time after immigrants' arrivals in Germany. This constrains our ability to

TABLE 5 | The resilience of immigrants to recent loss experiences.

	(12)	
Fixed (SE)		
Household income loss (*log*)	ns	
# Immigrant	ns	
Personal income loss (*log*)	−0.19 (0.03)	***
# Immigrant	ns	
Partner loss	−0.69 (0.05)	***
# Immigrant	ns	
Household member loss	−0.15 (0.02)	***
# Immigrant	0.11 (0.04)	*

Note: all models are based on model 10, standard errors in parentheses $^{\dagger}p < 0.1$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

test the selectivity hypothesis. Still, our approach is in line with other studies (e.g., Anson 2004). We account for current health information and health-related out-migration. We focus on universal personality traits which take shape early in life (Kajonius and Giolla 2017), and which are correlated with major psychopathologies (Rosenström et al., 2019). Our findings show that migrants are distinct personalities who use their openness and manage their neuroticism to boost and preserve subjective well-being. Future studies will have to systematically address these personality and mental health dimensions which strongly determine individual well-being.

Thirdly, it is beyond the scope of this analysis to further differentiate between selection, adaptation, and resilient behavior. Future studies need to cross-validate the findings, broaden particularly the limited measurement of social resilience, i.e., with wider social networks, or unemployment (Leopold et al., 2017). Also, the confounding of resilience by genetics and social environments needs to be disentangled as well as all interactions between these mechanisms. It would also be interesting to track subjective well-being down to second and third generations of immigrants. We would expect that these generations cannot preserve the happiness of the first-generation newcomers. They lack the sociocultural exposure, expertise, and social resilience to pursue the same economic goals as their parents. Much of the societal burden of migration, i.e., xenophobia or ethnic segregation, may grow out of this conflict. However, first-generation migrants benefit from their mental strength, their social resilience, and the different paces of economic and sociocultural integration.

Despite these limitations, the findings identify universal mechanisms which may apply anywhere and could have important policy implications. To begin with, as personality selectivity is strongly associated with the happiness of newcomers, future migration policies should be more targeted and also account for personalized diversity. Identifying open and less neurotic newcomers promises a better integration as happiness spreads in large social networks (Fowler and Christakis 2008).

Moreover, we find no empirical support for a quick and complete family reunion as a social integration measure. On the contrary, living in families may slow down the adaptation to the sociocultural environment of the host country. Immigrants seem not to get happier in larger households. They can also better cope with social losses. Only living with a partner predicts immediately a significant increase in subjective well-being of newcomers. Thus, migration policies may restrict subsequent family immigration to partners or postpone it for some years for other (adult) family members. Secondly, our results support an immediate access to the first labor market as it boosts happiness and speeds up integration. Also, newcomers should not concentrate in low-wage sectors where few Germans are employed as German mean income is important for their subjective well-being. This would also prevent first-generation immigrants to underprice labor and to undermine the labor market position of the local population.

DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found here: https://www.diw.de/en/diw_01.c.601584.en/data_access.

AUTHOR CONTRIBUTIONS

HB conducted the entire study.

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APPENDIX

TABLE A1 | The multilevel structure of subjective well-being of migrants and non-migrants.

	(1)	(2)	(3)	(4)	(5)
	Null-model	**2-Level**	**2-Level**	**2-Level**	**3-Levels**
Intercept	7.08 (0.00)***	7.03 (0.07)***	7.03 (0.05)***	7.10 (0.01)***	7.05 (0.06)***
σ residual	1.84 (0.00)***	1.84 (0.00)***	1.84 (0.00)***	1.44 (0.00)***	1.43 (0.00)***
σ person				1.21 (0.01)***	1.20 (0.01)***
σ cohort			0.11 (0.03)***		
σ nation		0.37 (0.06)***			0.22 (0.07)***
ρ (1)					0.58
ρ (2)			0.00	0.41	0.42
ρ (3)		0.04			0.01
N	247,902	247,902	247,902	247,902	247,902
-2LL	–503,333	–502,967	–503,109	–461,916	–461,745

*Standard errors in parentheses; *p < 0.05, **p < 0.01, ***p < 0.001; SOEP 1984–2014.*

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Unhealthy Immigrants: Sources for Health Gaps Between Immigrants and Natives in Israel

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The study focuses on sources for health gaps between Jewish immigrants and native-born Israelis. Unlike traditional immigrant societies where immigration is viewed as economically motivated, immigrants returning to Israel are viewed as the "returning diaspora". Because immigrants in Israel are entitled to the same health benefits and medical services as native-born, we expect Israel to attract unhealthy immigrants in disproportionate numbers. The data for the analysis are obtained from the Israeli National Health Interview Survey (2013–2015). The data set provides detailed information on health status and illness, sociodemographic attributes and origin of immigrants. Three major origin groups of immigrants are distinguished: the former Soviet Union, Western Europeans or the Americans (mostly Ashkenazim), and Asians or North Africans (mostly Sephardim). Our findings lend support to the expectations that the health status of all immigrant groups is poorer than that of native-born Israelis. The nativity–illness gap is most pronounced in the case of male immigrants (from Europe or the Americas or South Africa or Australia) and for female immigrants (from countries in the Middle East or North Africa) and least pronounced in the case of immigrants arriving from the former Soviet Union for both gender groups. Decomposition of the gaps into components reveals that some portion of the illness gap can be attributed to nativity status, but the largest portion of the gap is attributed to demographic characteristics. Neither socioeconomic status nor health-related behavior accounts for a substantial portion of the nativity–illness gap for all subgroups of immigrants.

Keywords: severity illness index, immigrants, nativity illness gap, Israel, decomposition analysis

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INTRODUCTION

Scholars of international migration and health have repeatedly demonstrated that immigrants in traditional immigrant societies, such as the United States, Canada and Australia, tend to be healthier than comparable native-born populations (e.g., Donovan et al., 1992; McDonald and Kennedy, 2004; Argeseanu Cunningham et al., 2008). They also have demonstrated that with increasing length of stay in the host country, immigrants health tends to deteriorate and becomes similar to that of native born with similar characteristics (e.g., McDonald and Kennedy, 2004). This phenomenon is referred to in the literature as "the healthy immigrant effect" thesis. The logic embodied in the thesis contends that only healthy persons are likely to select themselves into new destinations where they have to

compete for economic success. They do so despite limited access to health services and expensive medical treatment. Indeed, due to such selection processes, economic immigrants are expected to be healthier than the comparable native-born population and their health is expected to deteriorate with an increasing length of stay (e.g., Kreft and Doblhammer 2012).

In recent years, additional new models of immigration and immigrants health have been proposed; models that are not necessarily in line with the logic of the classic "healthy immigrant effect" model. Constant (2021) thoroughly discusses various additional models of migration such as "return migration" or "circular migration". These models distinguish between emigration and remigration and the migration direction, which can have important effects on the motives and outcomes of international mobility as well as on immigrant's health (e.g., Constant, 2021). However, in countries such as Israel where immigration is considered to be a "returning of Diaspora" rather than an economically motivated migration (e.g., Semyonov and Lewin-Epstein, 2003), the prevalence of the healthy immigrant effect or models such as "return migration" is questionable, if not highly doubtful (e.g., Constant et al., 2018). Although Jewish immigrants are (allegedly) "returning" to their homeland, in practice they are first-generation immigrants who are, unlike immigrants in other countries, entitled to all the civil rights and benefits equal to those of the native-born Israelis, including access to all health services. Unlike other immigrant societies, Israel opens its gates to Jewish immigrants regardless of their socioeconomic attributes or health criteria. The state grants citizenship and civil rights to the Jewish immigrants, including the rights to medical services and healthcare coverage upon arrival. That is, all residents (including new immigrants) are covered by the national health insurance and are entitled to health services that are provided to all residents.[1] Indeed, in such a context of migration, one possible assumption is that a disproportional number of "less healthy" or "unhealthy" immigrants would be attracted to the new homeland, especially if they are emigrating from a country with a less accessible health care (for European examples, see Maskileyson et al., 2019).

The few studies that examined the health status of immigrants in Israel support the expectation that immigrants are not as healthy as the comparable native-born population (e.g., Baron-Epel and Kaplan, 2001; Constant et al., 2018). Yet it is important to note that the immigrant population of Israel is highly heterogeneous, with immigrants arriving from a wide variety of countries. In fact, Jewish immigrants arrive in Israel from practically every corner of the world. Whereas some arrive from highly developed, rich countries, such as North America and Western Europe, others come from the less economically developed countries of Asia and Africa and many arrive from Latin America as well as from countries of the former Soviet Union (e.g., Maskileyson, 2014). The motivation and reasons for migration and the socioeconomic characteristics, as well as the health status, may vary considerably across subgroups of immigrants. Likewise, the sources of health disparities between native-born Israelis and immigrants may vary. Therefore, it is far from clear whether and to what extent the "healthy immigrant effect" phenomenon or immigrants health advantage is present among the various groups of immigrants in Israel. It seems that Israeli immigration does not follow the rules of the classic "healthy immigrant effect" model or the alternative model of "returning immigrant", but constitutes a test case of its own. Due to unavailability of data, it is difficult to test the thesis that immigrants to Israel are not as healthy as the comparable native-born Israelis at their time of arrival. Nevertheless, the available data enable us to test the argument that the immigrant populations in Israel are not as healthy as the comparable Jewish population even after a long stay in the country. The data also enable us to estimate the sources that are responsible for the nativity health gap in the context of Israeli society.

Therefore, in this study, we do not seek to focus on the healthy immigrant phenomenon or on changes in health of immigrants as compared to the native population over time or across generations but rather to contribute to the literature on sources for health disparities between immigrants and native-born. We do so by focusing on health disparities between immigrants and native-born in the context of the "returning diaspora" model of Israeli society. First, we examine the question whether and to what extent the immigrant health advantage is present across different nativity subgroups (i.e., immigrants of different origin and Israeli natives). We then further examine whether the sources of health gaps differ across subgroups of immigrants. To do so, we take advantage of a data set from the Israel National Health Interview Survey, INHIS-3 (2013–2015). The study population includes 4,511 Israelis aged 21 and over and a detailed series of self-reported information on illness and chronic conditions as well as on sociodemographic attributes of all respondents and country of origin of the immigrants. Such a data set provides us with a unique opportunity to examine the size and the sources of health gaps between native born and subgroups of immigrants in Israel. To the best of our knowledge, such an analysis has not been carried out in Israel or in other countries.

PREVIOUS RESEARCH

Immigrant Health Selection

The literature on the health of immigrants in traditional immigrant societies such as the United States, Canada and Australia provided firm support for the healthy immigrant effect thesis with studies arriving at the following findings: First, immigrants tend to be healthier, on average, than the comparable native population. Second, with passage of time in the host country, the health of immigrants tends to deteriorate and converge with the health level of the native citizens. Notably, this study does not aim to investigate the healthy immigrant effect as a whole; rather it focuses on the average health differences between immigrants and natives in Israel in general and for

[1]Notably, all Jewish immigrants can automatically become citizens of Israel upon arrival and, therefore, are eligible to join a health fund and gain accessibility to public health services.

several subgroups of immigrants in particular. It also focuses on the sources for health disparities between the immigrant and native-born populations.

Immigrants better health is attributed, first and foremost, to positive health selection into immigration (e.g., Ronellenfitsch and Razum, 2004; Akresh and Frank, 2008). According to the literature, immigrants are likely to be originated from the healthier segments of the population and therefore more likely to be healthier than the residents of the host country (e.g., Abraído-Lanza et al., 1999; Palloni and Arias, 2004). Studies distinguish between two types of positive immigrant health selection. The first is individual self-selection, whereby potential immigrants are likely to be physically and mentally healthy because only healthy persons are capable of migration and are willing to confront the risks of migration. The second selection is imposed by the authorities of the destination country, who apply health screening procedures to potential immigrants (e.g., McDonald and Kennedy, 2004).

The results of a few studies also indicate the existence of a negative health selection of the ill and elderly, who emigrate to destinations of higher quality health care (e.g., Jasso et al., 2004; Maskileyson et al., 2019). It seems reasonable to expect that while expensive and limited access to medical services is likely to deter immigration of the unhealthy, generous welfare and health policies may be an important consideration for immigration and particularly attractive for unhealthy immigrants (e.g., Borjas, 1999; Jasso et al., 2004). According to Borjas (1999), welfare programs attract immigrants who would not have immigrated without these programs (i.e., "the welfare magnet"). This assumption is especially relevant for Israel—a country where selection and admission of immigrants is based on common ancestry and heritage (i.e., Jewishness) and where health status criteria are irrelevant and where immigrants are entitled to health and medical services upon arrival.

Sources for Health Disparities Between Immigrants and Natives

The most common explanation for health disparities in the population is quite straightforward and is based on the role played by economic resources (e.g., Adams, 2003; Williams and Collins, 2016). According to this view, persons of lower economic status (e.g., immigrants, ethnic minorities and poor people) have limited access to advanced medical treatment and facilities or are unable to the purchase expensive medications due to the lack of economic resources (Semyonov et al., 2013; Semyonov et al., 2015). This line of explanation, however, is less relevant in a country such as Israel, where comprehensive public health is guaranteed to all residents.

Notably, despite the existence of an equitable "health basket" fund for all Israeli citizens, it obliges everyone to pay deductibles both for doctor visits and for prescription medications. The cost of certain medical drugs, for example, can be very costly and difficult to afford leading to the under-treatment of illnesses especially among disadvantaged populations. Although in Israel, public health insurance covers all citizens by the law (e.g., National Health Insurance Law, 1994), the residents may purchase extra health coverage, creating an inequality in access to health care. Indeed, differential rates of health insurance coverage can constitute one of the barriers experienced by disadvantaged populations in the access to higher quality medical services (e.g., Ku and Matani, 2001; Zuvekas and Taliaferro, 2003). Previous research clearly shows that in the United States, for example, ethnic and racial minorities and poorer people are less likely to purchase health insurance as compared to members of the majority population and wealthy people (e.g., Monheit et al., 2000; Semyonov et al., 2011).

Disparities in health can be also attributed to gaps in health care delivery based on age, gender and ethnicity (e.g., LaVeist, 2005; Saabneh, 2015). In the case of immigrants, disparities can also result from language barriers. That is, lack of language proficiency among immigrants may lead to underreporting of health problems and the inability to communicate, fill out medical forms and follow medical guidelines (e.g., Padela and Punekar, 2009). In addition, culturally influenced gender roles, norms, values, administrative barriers, bureaucracy as well as place of residence all can influence effective use of public health services and, thus, can contribute to health disparities between immigrants and native-born citizens (e.g., Feikin et al., 2009; Williams and Collins, 2016).

The Israeli Context

Israel, unlike many immigration countries, opens its gates to every person of Jewish descent who wishes to immigrate to Israel. According to the "Law of Return, 1950" - a central feature of Israeli immigration law - people with Jewish ancestry can immigrate to Israel and obtain Israeli citizenship upon arrival (e.g., *Introduction*, "The Israeli Law of Return, 1950"[2]). In terms of welfare laws, Israeli citizenship grants full and equal access to education and public health as well as social security benefits and public housing. Immediately upon arrival, immigrants are entitled to the same welfare basket as every citizen of the State of Israel, including full access to all welfare and public health services. In this sense, the state of Israel does not select Jewish immigrants due to poor medical conditions. Previous studies reveal that in comparison to Israel-born natives, immigrants to Israel are more likely to report higher rates of ischemic heart disease, diabetes, hypertension and other chronic illnesses (e.g., Constant et al., 2018).

However, Israeli immigrants are not a homogeneous population because they arrive from a wide variety of countries. Therefore, they differ in their characteristics (e.g., Semyonov et al., 2015). For example, immigrants from the former Soviet Union were more likely to be economically active than other groups of immigrants, while immigrants from Europe and America were found to have better access to high-status lucrative jobs than immigrants from the former Soviet Union or Asia, Africa and Ethiopia (e.g., Semyonov et al., 2013). Immigrants from the former Soviet Union reported higher rates of disease and lower health indicators than Israeli-born residents (e.g., Baron-Epel, 2001). Davidovitch et al. (2013) concluded

[2]The State of Israel recognizes that every Jew (as well as his or her spouse, children, grandchildren, and their spouses) as having a nearly absolute claim to be admitted and to settle in Israel (*Introduction*, "The Israeli Law of Return, 1950").

that economic and cultural factors influence health care utilization among immigrants and lead to inequality in health care delivery and health outcomes.

In the following, we examine health gaps by nativity status (i.e., across immigrants from different countries of origin) for both gender groups, respectively, and based on this information, we delineate the sources for the health disparities between immigrants and native-born Israelis. Specifically, we focus on Jewish immigrants from the former Soviet Union countries (hereafter FSU), Jewish immigrants of European origin from either Western Europe or the Americas or South Africa or Australia (hereafter EUAM), and Jewish immigrants from Middle Eastern countries and North Africa (hereafter MENA). We expect that health status of immigrants arriving from different countries of birth is likely to differ and that it will be lower than that of Israeli natives.

DATA SOURCE AND VARIABLES

Data

The data were obtained from the third Israel National Health Survey (INHIS-3) conducted in 2013–2015 by the National Center for Disease Control. The INHIS-3 is a cross-sectional, population-based survey, conducted by means of telephone interviews with a representative sample of the adult population dwelling in Israel (aged 21 and over). Random sampling of household telephone numbers was achieved via "DATARINGS" software, which contains data on landline telephone line subscribers in Israel. The response rate was 38.2% of contacted people among the Jewish population.

Data were collected through phone interviews conducted by the Survey Unit of the Israel Center for Disease Control (ICDC). The study population included 4,406 Israelis aged 21 and over (between the years 2013–2015), and the interviews were conducted both in Hebrew and in Arabic[3]. The questionnaire includes demographic characteristics as well as series of self-reported information on illness and chronic conditions. Because immigrants are selected and admitted to Israel mainly on the basis of their Jewish heritage (according to the Law of Return, 1950), only people of Jewish ancestry (immigrants and natives) were included in the analysis.[4] That is, we excluded from the sample people who identified themselves as: Arab Muslim, Arab Christian, Druze, Bedouim, Cherkes, Arab (religion not specified).

Prior to analysis, cases of missing data (n = 137) for the following variables were deleted listwise (illness index = 6, immigrant status = 1, country of origin = 5, age = 1, marital status = 4, number of children = 18, years of education = 60, employment status = 1; physical activity = 25; smoking = 42).

Variables

Nativity status is defined by place of birth, distinguishing between foreign-born (i.e., immigrants) and native Israeli born respondents. The immigrant population is further divided into three major geo-cultural (ethnic) origins: immigrants from FSU, EUAM and MENA.

The severity illness index, as an indicator of health status, is the dependent variable in the current study and is measured using a detailed list of self-reported illnesses. Self-reported illness and physical limitations have been shown to be useful predictors of physical health trajectories and mortality (e.g., Wolff et al., 2002; Huisman et al., 2003). The index was based on the 20 following self-reported health problems: asthma, hypertension, high cholesterol, triglycerides, heart attack, angina, heart failure, other heart disease, stroke, lung disease, joint disease, osteoporosis, Crohn's disease, colitis, cancer or malignancy, migraine, anxiety, depression, thyroid disorder, diabetes. We weighted the items by their severity using the Duke Severity of Illness Checklist (DUSOI) (e.g., Parkerson et al., 1993; Parkerson et al., 1996) (see details in Appendix 1). Health problems were rated according to level of severity and impact on overall health. DUSOI is based upon the clinical judgment of health care providers and was developed entirely in the primary care setting. The reliability and validity of the DUSOI has been established (e.g., Parkerson et al., 1996). We multiplied each item by its DUSOI severity score and then created a sum score index. Severity illness index values were then standardized to a percentile ranking scale on which individuals are ranked, each according to his or her relative health on a percentile illness ladder.

Following previous studies (e.g., Deaton, 2008), we included a series of sociodemographic variables as control variables: age of respondent (in years), marital status (married = 1; not married = 0), and number of children. We also selected measured indicators of *socioeconomic status* that are known to impact health (e.g., Eikemo et al., 2008), including years of education, employment status (employed = 1, unemployed or not in the labor force = 0), and total monthly net household income measured in four categories of income of dummy variables: 1) less than 8,000 NIS; 2) 8,000–12,000 NIS; 3) higher than 12,000 NIS; 4) Missing income. The second category, intermediate income, serves as a comparison category. In addition, we also included three groups of variables that capture *health-related behaviors*. First, we created a dummy variable to indicate whether a person is a current or former smoker (= 1) vs non-smokers (0). We distinguished between those who exercise (= 1) and do not exercise (= 0). Finally, we included a variable capturing the nutrition habits of the respondents. This variable was presented by a set of dummy

[3]The interviews in Hebrew were aimed at the Jewish population, while the interviews in Arabic were aimed at the Arab population. However, it is possible that a sample of Jewish residents were interviewed in Arabic, for example Jews from African-Asian countries who at the time of the interview were not fluent in Hebrew or chose to be interviewed in Arabic (i.e., Hebrew is not their first language).

[4]The INHIS-3 survey includes 4,406 Israeli residents from three population groups: 2,919 Jews, 1,347 Arabs (Muslims, Christians, Druze, and others living among the Arab population), and 140 others (i.e., non-Arab Christians and those who do not identify themselves with any religion). While the Israeli immigration policy encourages the migration of people of Jewish descent without imposing any restrictions, other immigrants (i.e., labor immigrants, asylum seekers, and refugees) have no (or unresolved) legal status (Nakash et al., 2012) and their share is relatively low as compared to other immigrant receiving countries. Using this survey, it was not possible to ascertain other immigrant groups (i.e., labor immigrants, asylum seekers, and refugees).

TABLE 1 | Means and distributions of variables, by nativity status and gender.

	Men					Women				
	Israeli natives	**All immigrants**	**FSU**	**EUAM**	**MENA**	**Israeli natives**	**All immigrants**	**FSU**	**EUAM**	**MENA**
Health measures	—	—	—	—	—	—	—	—	—	—
Has any illness, %	64	77	65	82	80	59	82	76	84	86
Does not have any illnesses, %	36	23	35	18	20	41	18	24	16	14
Illness index (percentiles), mean (SD)	40.19	52.39	41.00	59.55	53.16	38.40	57.09	49.46	58.09	62.70
	(33.48)	(33.53)	(33.67)	(33.65)	(31.10)	(34.81)	(31.87)	(32.41)	(31.41)	(30.70)
Demographics	—	—	—	—	—	—	—	—	—	—
Years since migration	—	46.09	29.27	48.08	56.46	—	43.38	29.41	43.71	55.14
	—	(18.40)	(12.07)	(19.82)	(10.16)	—	(18.44)	(14.07)	(18.69)	(12.19)
Age (in years)	51.31	63.89	53.77	65.91	69.25	49.19	61.39	55.02	61.54	66.86
	(15.22)	(14.84)	(14.78)	(15.81)	(9.07)	(13.97)	(14.01)	(13.86)	(15.56)	(9.68)
Married, %	85	85	83	85	85	83	70	68	71	71
Not married, %	15	15	17	15	15	17	30	32	29	29
Number of children, mean (SD)	3.10	3.03	2.09	2.85	3.93	3.20	3.03	2.08	3.25	3.65
	(1.95)	(1.85)	(1.60)	(1.59)	(1.88)	(1.84)	(1.85)	(1.09)	(2.10)	(1.80)
Socioeconomic status	—	—	—	—	—	—	—	—	—	—
Years of education, mean (SD)	15.40	14.36	15.14	15.78	12.27	14.82	13.63	15.05	14.94	11.18
	(4.89)	(5.05)	(3.16)	(5.03)	(5.52)	(3.07)	(3.96)	(3.11)	(3.85)	(3.41)
Employed, %	70	45	70	39	32	70	39	62	38	19
Unemployed or out of the labor force, %	30	55	30	61	68	30	61	38	62	81
Monthly household net income less than 8,000 NIS, %	18	28	19	18	45	25	40	39	28	54
Monthly household net income 8,000–12,000 NIS, %	22	24	31	21	23	23	21	25	21	17
Monthly household net income higher than 12,000 NIS, %	45	34	38	44	20	36	20	26	28	8
Missing income, %	16	14	11	18	13	16	18	10	23	21
	—	—	—	—	—	—	—	—	—	—
Current or former smoker, %	49	60	62	59	61	31	36	36	34	39
Never smoked, %	51	40	38	41	39	69	64	64	66	61
Participates in physical activity/sports, %	67	61	59	66	57	58	63	59	69	59
Does not participate in physical activity/sports, %	33	39	41	34	43	42	37	41	31	41
Less than 1 vegetable/fruit portion per day, %	27	22	21	21	23	23	19	17	15	26
1–3 vegetable/fruit portions per day, %	60	63	61	67	61	67	69	68	76	63
More than 3 vegetable/fruit portions per day, %	9	9	12	8	8	8	8	11	8	4
Missing for vegetable/fruits, %	4	6	7	4	8	3	4	4	2	7
Observations	875	606	160	231	215	903	530	160	185	185

Note: mean coefficients; SD in parentheses.

Except for the proportion of ill people, all calculations are made for the sample of respondents who have reported having at least one illness.

variables: 1) Less than one vegetable/fruit portion per day (= 1), 2) one to three vegetable/fruit portions per day (= 0), 3) More than three vegetable/fruit portions per day (= 1), 4) Missing for vegetable/fruit consumption (= 1) (see Appendix two for the definitions of the variables).

METHODS

We analyzed the data in three main steps. In step 1, we present a descriptive overview of the health, demographics, socioeconomic attributes and health-related behaviors for all subgroups of immigrants and Israeli natives by gender. In step 2, we estimate a set of regression equations predicting the severity illness index as a function of nativity status controlling for individual characteristics of the respondents. In step 3, we provide a decomposition analysis of the illness gaps between each subgroup of immigrant and Israeli-born native respondents into components attributed to differences in the nativity status, demographic characteristics, socioeconomic status and health-related behaviors. Notably, Israeli-born natives were, on average, considerably healthier than immigrants (see **Table 1**). Assuming that there might be a selection issue, we performed selectivity bias adjustment. Specifically, we fit a regression model with sample selection in the following two steps: 1) we estimated the probit model for the sample selection equation predicting whether the person has reported having any health difficulties (vs being healthy). The explanatory variables included in the selection probit equation are the same as for the ordinary least squares (OLS) regression of the second step (age, marital status, number of children, years of education, employment status, income, fruit and vegetable consumption, physical activity and smoking). The inverse Mills ratio calculated on the basis of this probit model. The inverse Mills ratio corrects for potential bias in estimates due to selection (non-random assignment) into having any illness. 2) Using the selected sample, we fitted the second step OLS model by

adding the inverse Mills ratio (or "non-selection hazard") from the first step to the main OLS equation as an additional independent variable (e.g., Manning et al., 1987). The significance of the inverse Mills ratio is an indication of selection effects.

We applied the Oaxaca (1973) and Blinder (1973) decomposition procedure to separate between different sources of the nativity–illness gaps. Notably, while this decomposition method has mostly been applied to wage and income inequality (e.g., Fortin et al., 2011), it can be used to understand the sources of health inequality (e.g., O'Donnell et al., 2006; O'Donnell et al., 2012). To estimate the illness gap, we decomposed the mean difference between the immigrant groups via the use of linear regression models for males and females separately (e.g., Maskileyson et al., 2021). This allowed us to distinguish between two components: 1) a component of the illness gap that is explained by the differences in individual attributes, such as demographics, socioeconomic status, health-related behavior (the Xs); and 2) the unexplained component of the illness gap attributed to unmeasured characteristics (the βs). To account for selection bias in the decomposition analysis, similarly to the regression analysis described above, we estimated the probit model and then applied the standard Oaxaca decomposition formulas adding the inverse Mills ratio from the first step (e.g., Neuman and Oaxaca, 2004).

The decomposition is performed according to the following notation:

$$\overline{Y}_{in} - \overline{Y}_{im} = \sum (\overline{x}_{in} - \overline{x}_{im})\beta_{\rho} + \left[\sum \overline{x}_{im}\left(\beta_{\rho} - \beta_{im}\right) + \overline{x}_{in}\left(\beta_{\rho} - \beta_{in} + (\alpha_{in} - \alpha_{im})\right)\right]$$

where $\overline{Y}_{in}$ and $\overline{Y}_{im}$ are severity illness indices of Israeli natives and immigrants, respectively. For the sake of parsimony, we refer here generally to immigrants, but we compared each subgroup of immigrants (i.e., FSU, EUAM and MENA) to Israeli natives. $\overline{x}_{in}$ and $\overline{x}_{im}$ are means of all predictors, and β_{in} and β_{im} are the coefficients of these predictors for Israeli natives and immigrants, respectively. β_{ρ} are the coefficients from a pooled regression. $\sum (\overline{x}_{in} - \overline{x}_{im})\beta_{\rho}$ is the portion of the gap that is explained by nativity differences in mean illness attributes. $[\sum \overline{x}_{im}(\beta_{\rho} - \beta_{im}) + \overline{x}_{in}(\beta_{\rho} - \beta_{in} + (\alpha_{in} - \alpha_{im}))]$ reflects the portion of the gap attributed to differences in individual attributes.

RESULTS

Descriptive Overview

Table 1 presents a descriptive overview of health in terms of percentage of people who have reported having at least one health problem and illness index (mean) on the percentile 100-point scale, for Israeli natives and for all subgroups of immigrants, by gender. Also, in **Table 1** we report the socioeconomic, sociodemographic and health-related behavior mean differences of immigrants and the native-born population. The data presented in **Table 1** reveal that all subgroups of immigrants are more likely to report poorer health as compared to Israeli natives. While 77% of immigrant men and 82% of immigrant women have reported at least one health problem, only 64% of Israeli men and 59% of Israeli women did so. Mean illness index of all subgroups of immigrants, without exception, was also higher than that of the Israeli native population of both genders. The health of immigrants from EUAM or MENA was considerably poorer than the health of the FSU immigrants. These patterns hold within both gender groups.

Immigrants differ from the native-born population not only in levels of health but also with respect to an array of socioeconomic and demographic characteristics. Immigrants also differ from Israeli native-born in their health behavior patterns. Immigrants tend to be 10 years older, on average, than the Israeli native-born population with FSU immigrants the youngest among the three immigrant subgroups. While the share of married people somewhat varies only among women, there are considerable differences in average number of children among all subgroups, with highest number of children among immigrants from MENA countries. Differences in educational level between immigrants and natives also vary by country of origin. The average number of years of education of immigrants from MENA countries is lower than that of native-born Israeli citizens. The educational level of FSU and EUAM immigrants is similar or even higher than that of the natives. The employment rates of Israeli native men and women are considerably higher than that of immigrants (with an exception of FSU immigrants), which is related to the younger age of the natives. Immigrants from all countries, without exception, tend to have considerably lower income as compared to natives. When it comes to health-related behavior, Israeli natives tend to smoke less, exercise more but have a somewhat less healthy diet as compared to immigrants.

Multivariate Analysis of Illness by Nativity Status

While the descriptive results revealed interesting differences among immigrants and natives, it is not clear whether and to what extent differences in health between the Israeli native population and subgroups of immigrants can be attributed to immigrant status, place of origin, to differences in sociodemographic or socioeconomic attributes of the immigrants or differences in health-related behavior. Therefore, in the analysis that follows, we estimate a series of regression models predicting illness index (presented as percentile 100-point scale). We conduct the two-step model including a separate probit model for sample selection bias followed by an OLS regression (e.g., Manning et al., 1987). Dichotomous variable—having an illness vs being healthy—serves as a dependent variable for the probit model. The probit model allowed us to estimate Mills ratios (introduced in the OLS regression to correct for selectivity bias)[5].

Tables 2, **3** display the coefficients of eight OLS regression equations predicting the illness index for men and women, respectively. In Equations 1a–4a, immigrant status is defined

[5]We do not include years since migration (YSM) in the analysis because in this study we do not focus on the healthy immigrant effect but rather on the health differences and their sources among the natives and immigrants at the time of the survey.

TABLE 2 | Coefficients (standard errors) of OLS regression equations predicting severity illness index, Men.

Variables	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Immigrant group	—	—	—	—	—	—	—	—
Immigrant (ref. Israeli natives)	−0.01	−0.43	−0.86	−1.05	—	—	—	—
	(1.70)	(1.71)	(1.73)	(1.73)	—	—	—	—
FSU (ref. Israeli natives)	—	—	—	—	−2.44	−2.86	−2.89	−3.01
	—	—	—	—	(2.56)	(2.60)	(2.61)	(2.63)
EUAM (ref. Israeli natives)	—	—	—	—	5.40*	4.92*	4.88*	4.36
	—	—	—	—	(2.32)	(2.34)	(2.37)	(2.38)
MENA (ref. Israeli natives)	—	—	—	—	−3.83	−4.02	−5.61*	−5.47*
	—	—	—	—	(2.43)	(2.48)	(2.56)	(2.56)
Demographics	—	—	—	—	—	—	—	—
Age (in years)	—	0.15	0.16	0.55*	—	0.12	0.11	0.42
	—	(0.16)	(0.16)	(0.24)	—	(0.16)	(0.16)	(0.24)
Married (ref. not married)	—	−2.30	−0.66	0.76	—	−2.65	−0.78	0.34
	—	(2.42)	(2.60)	(2.69)	—	(2.42)	(2.59)	(2.69)
Number of children	—	−0.54	−0.64	−1.00	—	−0.39	−0.39	−0.69
	—	(0.47)	(0.49)	(0.53)	—	(0.48)	(0.51)	(0.54)
Socioeconomic status	—	—	—	—	—	—	—	—
Years of education	—	—	−0.11	−0.01	—	—	−0.23	−0.13
	—	—	(0.17)	(0.17)	—	—	(0.17)	(0.18)
Employed (ref. unemployed or not in the labor force)	—	—	−3.40	−4.55*	—	—	−3.13	−4.05*
	—	—	(1.95)	(2.02)	—	—	(1.96)	(2.03)
Income less than 8,000 NIS (ref. 8,000–12,000 NIS)	—	—	0.60	2.26	—	—	1.10	2.41
	—	—	(2.45)	(2.55)	—	—	(2.45)	(2.55)
Income higher than 12,000 NIS (ref. 8,000–12,000 NIS)	—	—	−0.69	0.46	—	—	−1.27	−0.28
	—	—	(2.10)	(2.15)	—	—	(2.10)	(2.16)
Missing income (ref. 8,000–12,000 NIS)	—	—	−1.33	0.25	—	—	−1.78	−0.48
	—	—	(2.60)	(2.69)	—	—	(2.60)	(2.69)
Health behavior	—	—	—	—	—	—	—	—
Less than 1 vegetable/fruit portion per day (ref. 1–3 vegetable/fruit portions per day)	—	—	—	0.44	—	—	—	0.09
	—	—	—	(1.97)	—	—	—	(1.97)
More than 3 vegetable/fruit portions per day (ref. 1–3 vegetable/fruit portions per day)	—	—	—	−2.46	—	—	—	−1.94
	—	—	—	(2.91)	—	—	—	(2.91)
Missing for vegetable/fruits (ref. 1–3 vegetable/fruit portions per day)	—	—	—	−6.07	—	—	—	−4.15
	—	—	—	(4.60)	—	—	—	(4.62)
Current or former smoker (ref. never smoked)	—	—	—	5.27**	—	—	—	4.71*
	—	—	—	(1.91)	—	—	—	(1.91)
Does any sport (ref. does not do sport)	—	—	—	1.49	—	—	—	1.19
	—	—	—	(1.77)	—	—	—	(1.77)
Mills	−51.45**	−45.15**	−41.74**	−19.44	−51.16**	−46.10**	−43.69**	−25.82**
	(2.62)	(7.93)	(8.48)	(12.80)	(2.69)	(7.92)	(8.46)	(12.90)
Constant	70.49**	62.77**	63.79**	25.56	70.32**	64.54**	68.49**	37.59
	(1.85)	(12.76)	(14.22)	(21.73)	(1.88)	(12.73)	(14.22)	(21.96)
	—	—	—	—	—	—	—	—
Observations	1,481	1,481	1,481	1,481	1,481	1,481	1,481	1,481
R-squared	0.23	0.23	0.24	0.24	0.24	0.24	0.24	0.25
Adjusted R-squared	0.230	0.231	0.231	0.232	0.235	0.236	0.237	0.237

*Note: Standard errors in parentheses; ** $p < 0.01$, * $p < 0.05$; All models are estimated based on a two-stage estimation procedure using the inverse Mills ratio to correct for the selection bias.*

by a dummy variable distinguishing between immigrants and Israeli natives. In Equations 1a–4b, immigrant status is defined by three dummy variables representing immigrant's origin (i.e., FSU, EUAM and MENA) versus Israeli native-born population. In Equations 1a,b, we let illness index be a function of immigrant status. In Equations 2a,b, 3a,b, we add demographics and socioeconomic attributes, respectively, as predictors of the illness index. In Equations 4a,b, we add health-related behaviors to the set of predictors of the illness status. All models also include inverse Mills ratio, to account for a possible selection bias.

The findings of the regression adjusted for a selection bias reveal that the average health of male immigrants does not significantly differ from their Israeli born counterparts (see **Table 2**). Similarly, no statistically significant difference is found between male immigrant subgroups and male Israeli natives. Only the EUAM male immigrants have a significantly higher illness level as compared to native-born Israelis; however,

TABLE 3 | Coefficients (standard error) of OLS regression equations predicting severity illness index, Women.

Variables	Model 1a	Model 2a	Model 3a	Model 4a	Model 1b	Model 2b	Model 3b	Model 4b
Immigrant group	—	—	—	—	—	—	—	—
Immigrant (ref. Israeli natives)	4.78**	4.31*	3.18	3.40	—	—	—	—
	(1.75)	(1.76)	(1.77)	(1.77)	—	—	—	—
FSU (ref. Israeli natives)	—	—	—	—	3.39	2.64	1.94	2.28
	—	—	—	—	(2.56)	(2.60)	(2.61)	(2.61)
EUAM (ref. Israeli natives)	—	—	—	—	6.36*	5.89*	5.55*	5.73*
	—	—	—	—	(2.47)	(2.49)	(2.49)	(2.50)
MENA (ref. Israeli natives)	—	—	—	—	4.49	4.36	1.74	1.83
	—	—	—	—	(2.57)	(2.60)	(2.70)	(2.70)
Demographics	—	—	—	—	—	—	—	—
Age (in years)	—	0.29	0.34	0.64*	—	0.28	0.33	0.60*
	—	(0.18)	(0.19)	(0.28)	—	(0.18)	(0.19)	(0.28)
Married (ref. not married)	—	−2.06	0.61	2.17	—	−2.07	0.70	2.14
	—	(2.10)	(2.22)	(2.43)	—	(2.10)	(2.22)	(2.43)
Number of children	—	−0.52	−1.01*	−1.25*	—	−0.58	−1.04*	−1.23*
	—	(0.49)	(0.50)	(0.56)	—	(0.50)	(0.51)	(0.57)
Socioeconomic status	—	—	—	—	—	—	—	—
Years of education	—	—	−0.09	0.12	—		−0.15	0.05
	—	—	(0.26)	(0.26)	—	—	(0.27)	(0.27)
Employed (ref. unemployed or not in the labor force)	—	—	−5.22*	−6.56**	—	—	−5.04*	−6.29**
	—	—	(2.19)	(2.34)	—	—	(2.20)	(2.35)
Income less than 8,000 NIS (ref. 8,000–12,000 NIS)	—	—	2.83	3.80	—	—	2.94	3.83
	—	—	(2.34)	(2.43)	—	—	(2.34)	(2.43)
Income higher than 12,000 NIS (ref. 8,000–12,000 NIS)	—	—	−3.30	−2.45	—	—	−3.40	−2.60
	—	—	(2.31)	(2.35)	—	—	(2.31)	(2.36)
Missing income (ref. 8,000–12,000 NIS)	—	—	−2.73	−1.90	—	—	−2.92	−2.17
	—	—	(2.62)	(2.69)	—	—	(2.63)	(2.70)
Health behavior	—	—	—	—	—	—	—	—
Less than 1 vegetable/fruit portion per day (ref. 1–3 vegetable/fruit portions per day)	—	—	—	2.94	—	—	—	2.92
	—	—	—	(2.11)	—	—	—	(2.11)
More than 3 vegetable/fruit portions per day (ref. 1–3 vegetable/fruit portions per day)	—	—	—	−2.56	—	—	—	−2.36
	—	—	—	(3.06)	—	—	—	(3.07)
Missing for vegetable/fruits (ref. 1–3 vegetable/fruit portions per day)	—	—	—	−3.87	—	—	—	−3.13
	—	—	—	(5.43)	—	—	—	(5.46)
Current or former smoker (ref. never smoked)	—	—	—	3.49	—	—	—	3.32
	—	—	—	(2.09)	—	—	—	(2.09)
Does any sport (ref. does not do sport)	—	—	—	−3.46*	—	—	—	−3.58*
	—	—	—	(1.72)	—	—	—	(1.73)
Mills	−54.85**	−41.51**	−34.09**	−19.06	−54.72**	−41.54**	−34.87**	−21.28
	(2.63)	(8.30)	(9.26)	(14.17)	(2.67)	(8.32)	(9.27)	(14.27)
Constant	73.99**	54.68**	52.44**	24.98	73.91**	55.24**	54.45**	29.38
	(1.97)	(13.96)	(15.94)	(24.44)	(1.99)	(13.98)	(16.02)	(24.66)
	—	—	—	—	—	—	—	—
Observations	1,433	1,433	1,433	1,433	1,433	1,433	1,433	1,433
R-squared	0.28	0.29	0.30	0.30	0.29	0.29	0.30	0.30
Adjusted R-squared	0.284	0.285	0.292	0.296	0.283	0.285	0.292	0.296

*Note: Standard errors in parentheses; ** $p < 0.01$, * $p < 0.05$; All models are estimated based on a two-stage estimation procedure using the inverse Mills ratio to correct for the selection bias.*

this disadvantage disappears after controlling for health-related behaviors. A somewhat different picture can be observed for women (**Table 3**). Models 1a-4a reveal that the health of female immigrants is significantly lower than the health of native-born Israeli women, even after controlling for individual attributes and health-related behaviors. The health disparity is most pronounced for the group of EUAM female immigrants [b = 5.73 percent in Eq. 4b]. Therefore, EUAM immigrant women are less healthy than Israeli natives with similar demographic and socioeconomic characteristics and similar health-related behavior. Health of FSU and MENA immigrants does not significantly differ from that of the natives, especially after controlling for variations in individual attributes.

Not surprisingly, the coefficients representing individual characteristics reveal that illness tends to increase with older age. A higher number of children is associated with better health. One possible explanation is that people who are physically capable to become parents are a selective group with better

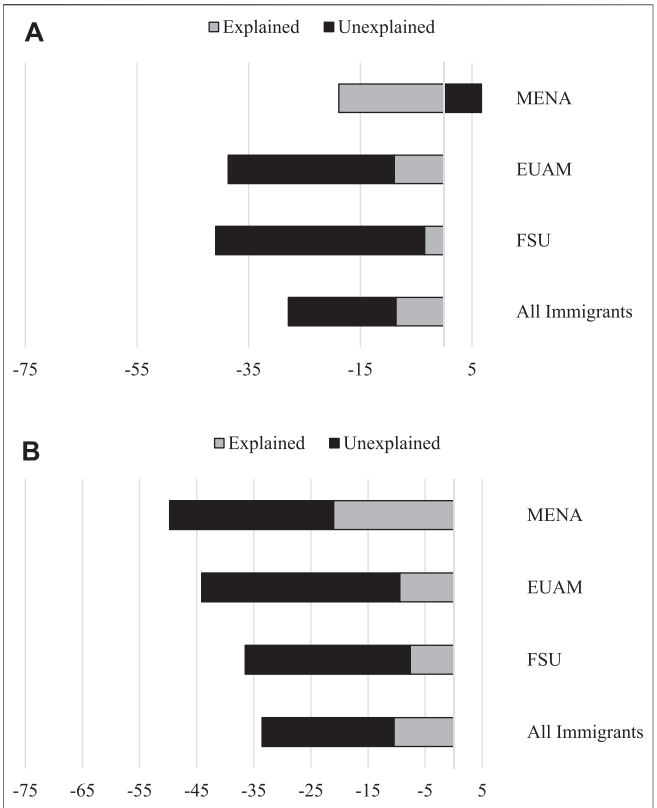

FIGURE 1 | (A) Decomposition of the total gap in the severity illness index (measured on a 100-point percentile scale) by nativity status, Men. **(B)**: Decomposition of the total gap in the severity illness index (measured on a 100-point percentile scale) by nativity status, Women.

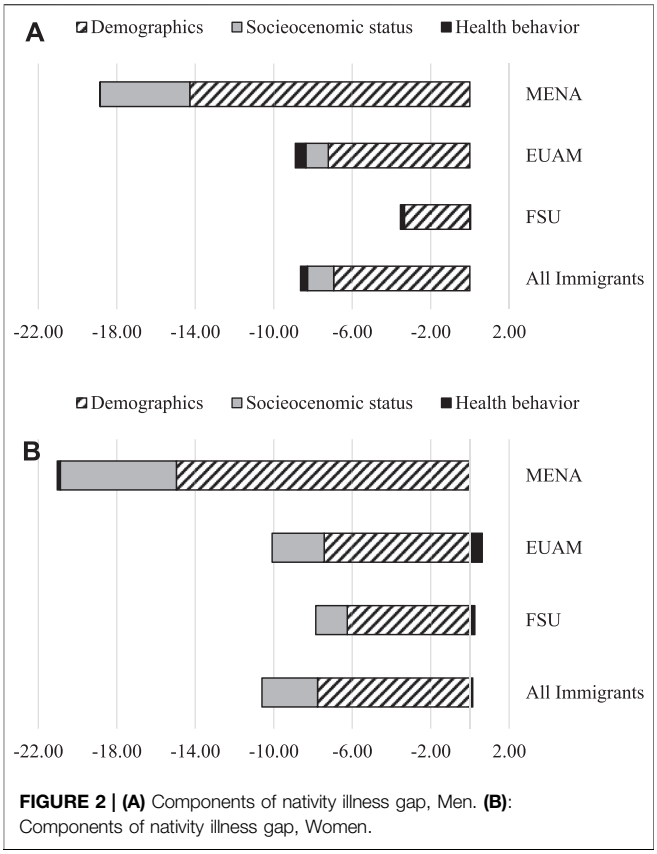

FIGURE 2 | (A) Components of nativity illness gap, Men. **(B)**: Components of nativity illness gap, Women.

health metrics. Illness is strongly associated with smoking, leading to deterioration of health. Finally, when looking at the contribution of the Mills ratio to the within-groups variance of illness index, it becomes apparent that the coefficient of Mills ratio in the models 1a-3a and 1–3b for both genders is negative and statistically significant. Therefore, we can conclude that there are unobserved variables increasing the probability of selection and the probability of a lower-than-average score on the dependent variable. However, after including health-related behavior variables to models 4a-4b, Mills ratio becomes insignificant for both men and women (e.g., Lennox et al., 2012). This means that when health related behavior variables are included, selection bias disappears.

Decomposing the Illness Gap by Nativity Status

In this section we decompose the illness gap between each subgroup of immigrants and Israeli native-born into two major components: 1) immigration status and ethnicity (unexplained component) and 2) differences in individual characteristics. The latter is further divided into mean differences of specific characteristics. For the sake of parsimony, we aggregated the coefficients into three distinct components: demographics (i.e., age, marital status, number of children), socioeconomic status (i.e., years of education, employment status and income), health-related behavior (i.e., smoking, sport, consumption of fruits and vegetables). The results of the decomposition analysis are presented in Appendix 3 for each subgroup of immigrants, by gender. The coefficients are presented in terms of the percentiles.

Examination of the immigrants illness gaps reveals that the largest illness gap is observed between Israeli-born males and EUAM male immigrants (38.7%) and between Israeli-born females and MENA female immigrants (49.7%). Among men, the adjusted illness gap between Israeli-born and FSU immigrants as well as between Israeli-born and MENA immigrants is not statistically significant. Among women, the illness gap between Israeli-born and FSU immigrants is not statistically significant and Israeli-born and EUAM immigrants is relatively large and equals about 44%.

Figure 1A shows that among men, most of the gap between the Israeli-born and EUAM immigrant participants (23% out of total 38.6%) is attributed to nativity status and only 8.9% to the differences in characteristics of the individuals. Likewise, among women, most of the gap between the Israeli-born and EUAM immigrant participants (34.7% out of total 44.1%) and between the Israeli-born and MENA immigrant participants (28.7% out of total 49.7%) is attributed to the nativity status (**Figure 1B**). A graphic illustration of the specific sources of the gaps for each subgroup is provided in **Figure 2A, B** for men and women, respectively.

Figure 2A demonstrates that differences in demographic characteristics such as age, marital status and number of children are the most important determinants of the illness gaps across all immigrant male and female subgroups. Demographics account for about 3%, 7% and 14% of the illness gaps between Israeli-born men and FSU, EUAM and MENA immigrant men, respectively. Interestingly, neither socioeconomic characteristics nor health-related behavior account for much of the illness gap between the Israeli-born and immigrant subgroups. Differences in socioeconomic status account for a small share of the illness gap (4.6%) only between MENA male immigrants and their Israeli-born counterparts. Similarly for women, differences in demographic characteristics account for about 6%, 7% and 15% of the illness gaps between Israeli-born and FSU, EUAM and MENA immigrant women, respectively (see **Figure 2B**). Differences in socioeconomic status among women account for 2, 3, and 6% of the illness gap between FSU, EUAM and MENA female immigrants and their Israeli-born counterparts, respectively.

STRENGTH AND LIMITATIONS

This study underscores the importance of mapping sources of health disparities between immigrants and native-born in the context of Israeli society. Despite its valuable contribution to knowledge, this study has several limitations, such as a possible selectivity effect regarding the years since migration, reasons for migration and the health status upon arrival at the destination country. Furthermore, the estimated model includes a selection of sociodemographic and socioeconomic variables that correlate with individual health, such as income, education, employment status, marital status and number of children. Due to lack of data, the analysis does not include such important variables as, for example, social inclusion (e.g., number of friends, feelings of social isolation).

Despite these limitations, the present study is one of the very few that investigates sources of health disparities between immigrants and native-born in general, and to the best of our knowledge the first one in the Israeli context. Indeed, the systematic and significant associations found throughout the analysis increase the confidence in the reliability of the findings and the contribution to knowledge.

DISCUSSION AND CONCLUSION

Consistent with our expectation, we find gaps in illness indices between immigrants and Israeli natives, with natives being healthier than immigrants. The analysis clearly shows that, unlike other traditional immigrant societies, the health of all groups of immigrants is considerably poorer than that of Israeli natives, even after controlling for age. We suggest that this finding might result from a negative self-selection of immigrants with regard to health. Indeed, this finding underscores our initial argument that the classic model of the "healthy immigrant effect" does not prevail or apply in societies such as Israel and in the context of "returning diaspora" migration. Immigrants to Israel, unlike immigrants to other traditional immigration societies (such as the United States, Canada or Australia) cannot be viewed as economic immigrants who tend to be selected from the healthier segments of the population. Indeed, the selection process of immigrants to Israel differs starkly from selection of immigrants to other societies. That is, Jewish immigrants to Israel are selected only on the basis of ancestry regardless of their socioeconomic status or health. Furthermore, immigrants in Israel are covered by national health insurance and, therefore, are entitled to citizenship and medical services upon arrival to the country. Indeed, such a context is likely to attract many less healthy immigrants.

Using the decomposition method (O'Donnell et al., 2012), we compared health as defined by the severity illness index and examined the sources of the health disparities across different nativity groups by gender. Although all immigrant groups are characterized by poorer health than the comparable Israeli born, the findings reveal that the nativity–illness gap is most pronounced in the case of EUAM male immigrants (arriving from Europe, the Americas, South Africa, or Australia)[6] and MENA female immigrants (from Middle Eastern countries and North Africa). By contrast, the nativity–illness gap is least pronounced in the case of immigrants arriving from FSU countries for both gender groups [partly contracting Baron-Epel's (2001) findings]. Focusing on the sources for the health gaps, the data reveal that whereas some portion of the illness gap can be attributed to nativity status, the largest portion of the gap is attributed to demographic characteristics.

In addition, the data demonstrate that health of both immigrants to Israel and native-born Israelis tends to deteriorate with age and that married persons and those who are parents tend to be healthier than singles and non-parents. The analysis shows that differences in age, marital status and parenthood explain a substantial portion of the nativity–illness gap. This may be attributed to the importance of a supportive family network for health. It can be assumed that a larger family unit is able to provide more support and medical supervision, thereby assuring the well-being of family members. Immigrants are more likely to be socially isolated living apart from their extended family network (if some of their family members still reside abroad). Therefore, they tend to receive less family support (e.g., assistance with medical care, nursing, or financial aid) as compared to the native-born Israelis and, therefore, have poorer health.

As expected, the data also show that health-related behavior, such as exercise, is positively associated with health, while smoking exerts a negative effect on the health of both immigrants and natives. Nutrition (e.g., intake of fresh fruits

[6]Over the 50% of our EUAM sample include immigrants from Eastern Europe and Germany, who are more likely to be Holocaust survivors or Holocaust survivors children. Literature shows that survivors tend to suffer lasting physical, mental, psychological, and social impairments. Their trauma recovery was also more difficult because the families and communities, through which they could gain support, were destroyed (e.g., Harel et al., 1993). Therefore, the historical background of EUAM group may serve as another explanation for their poorer health status.

and vegetables), on the other hand, does not have a statistically significant association with health.

Curiously, however, the decomposition analysis reveals that neither differences in socioeconomic status nor differences in health-related behavior account for a substantial portion of the nativity–illness gap for all subgroups of immigrants. The negligible (unexpected) effect of income on health and on health disparities between immigrants and natives can be attributed to the openness of the Israeli public health system, which provides mostly free access to health services to all residents regardless of their nativity status. Therefore, lack of financial capacity becomes less of a factor in explaining differential access to health services in Israeli society. In other words, the lower income of immigrants does not preclude them from access to medical services and medical treatment.

Yet despite the free access to medical services in Israeli society, a negative effect of the lowest income category on health status and health disparities is observed, implying that the health of the poorest people is worse than the health of all others. This finding can be attributed to the "deductibles" charged for treatments and to additional charges when purchasing specific medications. Paying such deductibles may still be burdensome for low-income individuals, who cannot finance exclusive treatments or cannot purchase specific medications. Likewise, low-income residents, despite their free access to public medical services, may not be able to purchase additional (private) health insurance which covers the use of private medicine. Lack of additional coverage may have, in turn, detrimental consequences for the health of the poor regardless of whether the poor citizens are immigrants or native born.

To summarize, this study examines the sources for illness gaps between three Jewish immigrant groups (EUAM, FSU, and MENA) and native-born Jewish Israelis. In line with previous studies (e.g., Constant et al., 2018), our findings reveal that the health status of all immigrant groups is poorer than that of native-born Israelis. The nativity–illness gap is most pronounced in the case of male EUAM immigrants and for female MENA immigrants and least pronounced in the case of immigrants arriving from the FSU for both gender groups. Decomposition of the gaps into components reveals that some portion of the illness gap can be attributed to nativity status, but the largest portion of the gap is attributed to demographic characteristics (i.e., age, marital status, number of children). Neither socioeconomic status nor health-related behavior accounts for a substantial portion of the nativity–illness gap for all subgroups of immigrants. While immigrant health selection is not directly measurable with the data at hand, we argue that it can be a part of the unexplained illness gap between immigrants and natives. That is, in the context of "returning diaspora" migration, unhealthier immigrants may be drawn to the health care system and social benefits.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsoc.2021.686306/full#supplementary-material

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Gendered Body Mass and Life Satisfaction Among Youth in Three Western European Immigrant-Receiving Countries

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In this study we aim to show distinctive patterns of the association between body weight and life satisfaction for adolescent boys and girls, respectively. We understand such patterns by bringing multiple mediating factors into one theoretical framework centred on normative perceptions. By drawing data from the first wave of the CILS4EU that captures 14–15-year-olds in Germany, the Netherlands and Sweden, findings show that psychological factors, indicated by self-esteem and mental state, explain the association between BMI and life dissatisfaction substantially, for both boys and girls. Relationships with parents (particularly among boys) and relationships with peers (particularly among girls) also play significant roles. Moreover, the association between being underweight and life satisfaction among girls varies across ethno-racial groups. Girls originating from Eastern Europe have a tendency to gain more life satisfaction when being underweight, whereas girls rooted in Sub-Saharan African and Caribbean countries display consistently low levels of life satisfaction when being underweight.

Keywords: life satisfaction, body mass index, Western Europe, social relations, self-esteem, mental stability, ethno-racial diversity, adolescents

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INTRODUCTION

Adolescence is an important stage of an individual's development and is marked by transitions in young people's lives in multiple dimensions, including the completion of compulsory education, entry into first romantic relationships, formation of attitudes, and consolidation of religious views. The extent to which adolescents master these transitions successfully might have an impact on their subjective well-being or life satisfaction, not only in the adolescent stage but also throughout their lives (Olsson et al., 2013; Switek and Easterlin, 2018).

In this period, appearance gains particular importance in youth's life satisfaction. Due to rapid physiological transformations, the lack of satisfaction with one's body or looks is not uncommon among adolescents. During puberty, while boys tend to experience rapid growth which results in their bodies being tall but often overly lean and unmuscular, girls are more prone to gaining body fat. Such changes might cause dissatisfaction and even distress among adolescents, if they self-perceive as failing to meet the mainstream beauty standards in their societies.

Existing studies from American and other predominantly non-European contexts have examined the relationship between body mass and life satisfaction among adolescents, and largely demonstrated distinctive patterns for girls and boys (Pingitore et al., 1997; Vincent and McCabe, 2000; Cohane and Pope, 2001; Mäkinen et al., 2012; Agam et al., 2015). However,

explanations for those patterns are inconclusive. This study thus aims to fill the research gap by bringing multiple mediating factors into one explanatory model to understand how teenage boys and girls perceive and feel about their body weight in different ways.

From the socio-psychological perspective, life satisfaction is a subjective evaluation process, in which individuals compare their (perceived) situations with their hopes or expectations of how the situation should be—namely an ideal situation (Campbell et al., 1976; Shin and Johnson, 1978; see also Michalos, 1985 for an extensive overview). Whereas factual situations can largely be captured by individuals' current state and circumstances, one's perception of an ideal situation involves far more complicated mechanisms. In terms of the relationship between body weight and life satisfaction, we argue that both external and internal factors play important roles in shaping youth's self-perceptions; namely, how close they are to the ideal body weight. Externally, we will examine social influences by focusing on a teenager's relationships with parents, teachers and peers. Internally, we will examine psychological factors, indicated by self-esteem and mental state. By paying particular attention to youth with migration backgrounds, we will further examine whether or not and how teen boys' and girls' subjective evaluations of body weight vary across ethno-racial groups. Using data from three European countries—Germany, the Netherlands and Sweden, this study will show whether gendered patterns of the association between body weight and life satisfaction, established upon empirical evidence in America and other non-European contexts, would hold true in the context of Western European countries.

THEORETICAL FRAMEWORK

Gendered Normative Perceptions of Body Weight

The perspective of *normative expectations* (Elster, 1989; Coleman, 1990; Hechter and Opp, 2001) indicates that life satisfaction is elevated when one's own circumstances resemble those considered appropriate in a given society. Regarding body weight, the ideal state and the ways of achieving it are commonly transmitted by social media and the entertainment industry in modern societies. Through those channels, cultural norms defining an idealized appearance and body weight are formed, disseminated, and further reinforced. This implies that normative perceptions of body weight are context-specific. For example, in the Western world, and particularly among higher socioeconomic strata, the perceived perfect body is a slender one (Swami et al., 2010), whereas being obese or overweight might be less psychologically burdensome in societies where heavy body weight is more acceptable (Wadsworth and Pendergast, 2014).

Context-specific norms about body weight/size drive the importance of appearance for success and the fulfilment of one's own worth through social influences, which in turn, has direct consequences on life satisfaction. This is because one's self-perception of worthiness, sense of dignity and feeling of happiness are often gained through interactions with others, and negative feedback from others has proven being associated with low levels of subjective well-being (Vincent and McCabe, 2000). Regarding body awareness, adolescents often form their perceptions based on feedback from the immediate environment, and particularly those influential in their daily lives. As argued by Vincent and McCabe (2000), being teased or criticised of one's body weight/size by *family members* internalizes an ideal body image and is a predictor of body dissatisfaction and eating disorder. Summarizing research on within-family experiences among overweight children, Forste and Moore (2012) point out that children beyond the normal weight range are likely to experience more negative within-family interactions. They are under constant pressure to diet, have stressful mealtimes and frequent conflicts with other family members. *Friends and peers* are a second salient source of social influences, as a large proportion of adolescents, particularly girls, are frequently engaged in discussions and even direct comparisons about body/physical looks with their peers. According to Dohnt and Tiggemann (2005), weight-related teasing among peers reinforces idealized body images as well as dieting behaviour among adolescents, and directly triggers youth's body dissatisfaction, especially when their body weight/size falls outside the "acceptable" range (Forste and Moore, 2012). As a result, underweight and overweight adolescents tend to have lower levels of subjective well-being than their normal-weight counterparts, due to different social encounters they experience (Forste and Moore, 2012). *Teachers* constitute the last indispensable source of social influences in youth's daily lives. Overweight youngsters have a higher risk of being stigmatized and even discriminated against by their teachers at school, which may further decrease the already low levels of life satisfaction among them (Sabia, 2007).

It must be pointed out that the formation of perceptions of an ideal body image is a gendered process (Vincent and McCabe, 2000; Cohane and Pope, 2001; Mäkinen et al., 2012; Agam et al., 2015). Boys tend to feel dissatisfied with their bodies when they are either below or above the normal weight, namely, an inverse U-shaped relationship between body weight, indicated by the Body Mass Index (BMI hereafter) and subjective well-being is observed (Mäkinen et al., 2012; Linna et al., 2013). By contrast, girls' body dissatisfaction increases with their body weight (Pingitore et al., 1997; Mäkinen et al., 2012). Sources of these gender differences can largely be attributed to normative perceptions. As Frederick et al. (2007) stated, an ideal male body is a big, masculine one, which consequently gives rise to boys' preference for a pronounced body mass as it is considered a sign of muscularity. An ideal female body, particularly within the Western context, is a slender one. The difference between the ideal of thinness for a female body and the ideal of muscularity for a male body naturally leads to gender-specific associations between BMI and life satisfaction, meaning that such relationships must be examined for boys and girls separately.

Psychological Mediators in the Internalization of Normative Perceptions

The above section has highlighted the importance of societal contexts and social interactions in the formation of normative perceptions. Nevertheless, the extent to which those two aspects influence youth's self-perceptions of their body weight/size

depends on how they internalize influences of cultural norms, especially imposed by the immediate environment. Such an internalization process is highly contingent on *psychological factors*. For example, youth's self-esteem, defined as the extent to which they like and accept themselves, is known to predict the ways by which they respond to challenges and behave in critical situations. Individuals with high self-esteem are more likely to cope better with stress and feel good about their lives (Schachter et al., 2014). Those with low self-esteem, on the contrary, tend to interpret ambiguous comments negatively or be emotionally overwhelmed by critiques. Mental stability is the other important mediator, as individuals with less stable mentality are more likely to perceive their body images negatively and display lower levels of life satisfaction (Ali et al., 2010).

Discrepancies between one's own BMI and mainstream norms of the body weight/size might lead to stress among adolescents, though girls and boys are likely to feel stressed for different reasons. For girls, given the widely accepted endorsement for a slender body shape in Western countries, weight gaining is one of the most common concerns that teen girls have about their bodies. Overweight teen girls tend to hold negative self-perceptions (Forste and Moore, 2012), which in turn, give rise to their feelings of unworthiness, depression and low self-esteem (Cohane and Pope, 2001; Sarlio-Lähteenkorva et al., 2003; Needham and Crosnoe, 2005; Frederick et al., 2007; Merten et al., 2008; Mäkinen et al., 2012). A skinny body shape is not endorsed by boys, however. Quite the opposite, being underweight may imply the lack of strength and masculinity, and is thus more likely to be associated with negative self-perceptions and low self-esteem among boys. The question is therefore whether or not the relationship between body weight/size and life satisfaction would remain for each of the gender groups, once psychological factors are taken into account.

Ethno-Racial Variations in Gendered Normative Perceptions

Due to the fact that perceptions of an acceptable body size differ across societies, the gender-specific association between BMI and life satisfaction is predicted to vary among youths from various ethnic and racial backgrounds (Sarlio-Lähteenkorva et al., 2003; Swami et al., 2010). For instance, obesity is stigmatized in the West, where thinness is prevalently associated with attractiveness and success, particularly among girls (Forste and Moore, 2012). Heavier bodies, on the other hand, are favoured in socioeconomically less developed societies, since there, heavyset bodies are closely associated with fertility and sexuality for women, whereas athleticism and strength for men (Swami et al., 2010).

That being said, the trend of globalization is, to a great extent, a process of westernization for non-Western cultures. Under influences of Western social media and popular culture, it is unsurprising that adolescents in non-Western societies might embrace Westernized beauty standards even more than their counterparts born in the Western world, if their normative perceptions are driven by westernization. In their comprehensive review of existing literature, Sarlio-Lähteenkorva et al. (2003) point out that Russian adolescents appear to be more dissatisfied with their body weight, despite the fact that the percentage of Russian adolescents reporting the normal weight is much higher than that of their American counterparts. In the same study, the authors also compare teenagers between Finland and Estonia, and findings show that fewer girls aged 15–16 are satisfied with their body weight in Estonia than in Finland, whereas the situation is the opposite for Finnish and Estonian boys. The authors argue that thinness in the Eastern European context could be interpreted as being positively associated with the chance of obtaining better jobs and achieving higher social status for young women, and therefore becomes the core attribute of the female body ideals among adolescent girls (Sarlio-Lähteenkorva et al., 2003).

Furthermore, the ethno-racial variation in the association between body weight and life satisfaction has been reported to be more pronounced among women (Kronenfeld et al., 2010; Swami et al., 2010). According to the meta-analysis by Grabe and Hyde (2006), black women tend to adopt an ideal of a larger and stronger body, so that they are more open to accept overweight body size, experience less social pressure about weight, and are overall more satisfied with their body images than white women. Unlike African American women, Asian American females are more likely to value the mainstream beauty standards and are hence not different from white women in terms of body satisfaction. Wardle et al. (2006) study based on a sample of university students from 22 countries worldwide reveals substantial concerns about being overweight among both Asian women and men, even though Asian students are on average slimmer than students from other ethnic/racial origins.

The Current Study

Built upon existing literature, this study aims to address the following questions: 1) How do teen boys and girls perceive and feel about their body weights, respectively? 2) How do social and psychological factors mediate the relationship between body weight/size and life satisfaction for teen boys and girls, respectively? And 3) to what extent can the variation in youth's life satisfaction be attributed to their ethno-racial origins? By focusing on youth in three Western European immigrant-receiving societies, this study supplement the existing literature that was mainly concentrated on the American context.

DATA AND VARIABLES

Our study employs data from the first wave of the CILS4EU (Children of Immigrants Longitudinal Survey in Four European Union Countries) study carried out among 14–15-year-old youth with and without migration background in Germany, the Netherlands and Sweden (Kalter et al., 2016; Kalter et al., 2019). Although England was also included in the CILS4EU data, it was removed from analyses due to very high non-response rates on body weight and height, information that is crucial to compute the BMI. The first wave of the CILS4EU data was collected between the end of 2010 and the beginning of 2011.

Students were selected through a three-stage sampling design. First-stage sampling units were schools having students in targeted age groups, through the proportional sampling method based on school size. Prior to sampling, schools were assigned to explicit strata according to the proportion of students with immigrant backgrounds so that oversampling schools with large shares of immigrants could be possible. The second-stage units were classes within targeted grades in sampled schools, from which two classes were randomly sampled. Finally, the third-stage sampling units were students within classes. All students of a class were selected following the whole sampling method. As a result, 5,013 students from 271 classes completed questionnaires in Germany, 4,363 students from 222 classes in the Netherlands, and 5,025 students from 251 classes in Sweden. Response rates at the school level (after equivalent replacements of non-responding schools) were 90% in Germany, 69% in the Netherlands and 77% in Sweden. Response rates at the student level were 81% in Germany, 91% in the Netherlands and 86% in Sweden.[1]

The dependent variable in our analyses is life satisfaction, captured by a ten-point scale with higher values indicating higher levels of life satisfaction. The main independent variable is the classification of body mass based on BMI—body weight in kilograms divided by square of height in metres.[2] BMI was collapsed into three categories—underweight, normal weight and overweight—based on the WHO (World Health Association) scale adjusted for adolescents' age (in months) and gender.[3] Among respondents who reported weight and height information,[4] about 2.7% of all respondents in the sample are underweight, 81% are within the range of a normal weight, and almost 17% are overweight. The proportion of overweight is highest in Germany (about 20%), closely followed by Sweden (18%), and the Netherlands has the lowest proportion (10%).

As aforementioned, boys and girls hold distinctively different perceptions of what an ideal boy/girl body image should be like. Their (dis)satisfaction with their own bodies is based on comparisons with the standard, as well as other counterparts, in their own gender group. In other words, the focus of this study is the distinctive pattern of the BMI-LS (life satisfaction) relationship within each of the gender groups. Cross-gender comparisons on the BMI-LS association would be unwarranted, due to different body weight/size standards imposed on boys and girls. For this reason, we carry out analyses for boys and girls separately.[5]

The variation of life satisfaction is sufficient enough to be treated as a continuous variable, suitable for Ordinary Least Square (OLS) regression models. We have also run Ordinal Logistic Regression models by collapsing the ten-point scale of life satisfaction into three groups, and find patterns in line with those reported by OLS models. Detailed information is presented in the Sensitivity Analysis section.

Other variables pertaining to respondents' demographic characteristics are age, groups of origin and immigrant generations. Groups of origin are a series of dummy variables, including the majority native-born population (used as a reference group), referring to individuals who themselves and whose parents were born in the survey country. Among those who reported migration background, we differentiate young people originating from Western Europe, Eastern Europe, Sub-Saharan Africa or the Caribbean, Middle East and Northern Africa (MENA), and the rest of Asia, based on the information on their own countries of birth as well as their parents' countries of origin.[6] Individuals originating from other countries and those from unknown groups of origin are categorized as "others."

We control for generational status, including 1) the first generation, i.e., young people who migrated themselves, 2) the second generation, i.e., children of immigrants, and 3) children from mixed parental background. For the third group we differentiate between children of transnational marriages (with one of the respondent's parents having direct migration experience whereas another being native-born but having at least one immigrant parent) and children of intermarriages (with one of the parents being a migrant her/himself whereas another being native-born and having no immigrant parent). Controlling for migration status is necessary, for the purpose of tracing possible differences related to one's own experience of migration[7] and the contexts of family socialisation.

In addition to demographic characteristics, we further control for respondents' family type, which is a dummy variable indicating whether or not a child grew up in a single-parent household, and family background measured by the highest level of parental educational attainment. A set of dummy variables captures a range of educational levels for parents, varying from primary education or none (used as the reference category) to

[1]For more details on the study design and technical issues, see Kalter et al. (2019) and www.cils4.eu.

[2]Both weight and height are self-reported.

[3]Grouping thresholds are retrieved from https://www.who.int/tools/growth-reference-data-for-5to19-years/indicators/bmi-for-age.

[4]Five cases were excluded because of missing information on either weight or height.

[5]We have also run interactions with two gender groups included in the same model, and the results confirm that the life satisfaction gap between boys and girls is almost completely associated with the gender factor itself (results are not presented, but available upon request).

[6]For respondents whose parents were born in the same region, their ethnic background was coded in line with their parents' birth region, regardless of their own birth country. For respondents whose parents were born in different regions, there were two scenarios. One is that the respondent was born in the same region with one of the parents, in which case his/her ethnic background was coded based on his/her own birth country. The other is that the respondent and two parents were born in three different regions. If so, the respondent's ethnic background was coded in line with the country origin of the head of the household, which referred to the father's birth place in two-parent families and the birth place of the parent with whom the respondent mainly lived in single-parent families. In complicated scenarios, however, information about birth countries of either the respondents themselves or one or both of their parents was often missing, so that those cases were treated as missing values and excluded from analyses (such cases constituted about 1% of the total sample).

[7]To participate in the study, the respondents had to be sufficiently fluent in the host-country languages. Unsurprisingly very few first-generation migrants are recent arrivals.

lower secondary, to upper secondary, and finally to tertiary education. Respondents with missing information on parental origin form a separate group.

The first model, in which only socio-demographic characteristics are included, serves as the benchmark model. Based on it, we first explore the importance of social relationships in mediating the association between body weight and life satisfaction, by focusing on the roles of parents, teachers and peers.[8] The parent–child relationship is captured by a mean score of three items, including whether parents try to comfort a child when s/he is sad, whether parents often criticize a child, and whether parents try to understand what a child thinks or how s/he feels. Higher values of this variable, measured by a five-point scale, refer to more comforting parent-child relations. The variable "teacher–child relation" is captured by a mean score of two items "teachers encourage me at school," and "there are teachers who treat me unfairly," which are recoded so as to vary in the same direction in a five-point scale. Higher values of the generated variable refer to more positive teacher–child relations. The variable "peer relation" is measured by a mean score pertaining to questions of whether the respondent is teased or bullied at school. Answers to the questions on how often a respondent is teased or bullied by other students in the month prior to the interview time are coded as a four-point scale, namely, every day, once or several times a week, less often than once a week, and never. Similar to other variables, we code the peer relation variable in the order for higher values to reflect more favourable peer relations.

The second set of focal mediators are psychological factors. One is self-esteem, derived from a set of three questions capturing whether the person has a lot of good qualities, has a lot to be proud of, likes her/himself the way s/he is. Responses to the three questions range on a five-point scale from strongly agree to strongly disagree. The generated variable represents a mean score of the three variables and is coded with higher values standing for more positive perceptions of oneself. Another variable, mental state is a mean score of two items measuring feelings of depression and unworthiness. Both variables range on a four-point scale (including the categories "often true," "sometimes true," "rarely true," and "never true"), and the generated variable is the mean score of the two items with higher values representing better mental well-being.

DESCRIPTIVE PATTERNS

Table 1 reports two parts of descriptive statistics, frequency distributions by regions of origin, as well as means and standard deviations of major mediating variables. Both parts of descriptive information are reported by BMI groups and for boys and girls separately. In terms of sample distributions among the three BMI groups, boys and girls have virtually the same proportion of being underweight, but the percentage of girls being overweight is only a half of that of their boy counterparts. Taking a close look at the distribution by regions of origin within each BMI group, one can clearly see that chances for respondents from certain regions falling into certain BMI groups are by no means random. Among boys, those originating from Sub-Saharan Africa/the Caribbean show a percentage of being underweight that doubles their percentage in the overweight group. The similar pattern is also observed among Asian boys, with a slightly smaller gap between those two percentages. By contrast, those originating from the MENA area present a percentage of being overweight that is almost double their percentage of being underweight. Among girls, those originating from the MENA area are also more often found in the overweight group (their percentage in the overweight group almost doubles that in the underweight group), whereas Asian girls are very likely to be underweight (their percentage in the underweight group is more than triple their percentage in the overweight group). We must point out that when the gender subsamples are further divided by ethnic origin, the size of the "underweight" group becomes considerably small for both boys and girls, as shown by **Table 1**. This we consider one of the major limitations of this paper. In the robustness check shown in the **Supplementary Appendix SA**, we therefore regroup the BMI distribution by differentiating the interquartile range (25th–75th percentile) from the lowest and highest 25th percentile, and name them as "normal weight," "underweight" and "overweight," respectively. The major finding based on this alternative grouping method remains consistent with what is presented in this paper. More details are discussed in the following section.

Regarding major mediating variables, boys with normal weight enjoy the most favourable relations with their teachers and peers, have the highest level of self-esteem and are the least depressive. However, it is underweight boys who report the most comforting relations with their parents, though the average quality of relations with parents does not fall far behind for normal-weight boys. For girls, qualities of social relations with parents and teachers do not seem to differ drastically across three BMI groups. However, with respect to peer relations, overweight girls report much worse relations with peers, compared to their underweight and normal-weight counterparts. Psychological traits vary with girls' body weight, with both self-esteem and mental health descending from the underweight to normal-weight, and then to overweight group.

Figure 1 subsequently presents whether the patterns of life satisfaction by BMI among Western European teen boys and girls are similar to those reported elsewhere. For male adolescents, we observe an inverse U-shape pattern, echoing the findings of earlier research (Mäkinen et al., 2012; Linna et al., 2013). Girls are evidently dissatisfied when they fall into the overweight range, but the life satisfaction gap between being normal weight and underweight is too trivial to be significant. This trend is not completely in line with existing research, which indicates a linear relationship between weight and life satisfaction among girls (Pingitore et al., 1997; Mäkinen et al., 2012). In accordance

[8]For the original wording of the questions consult the following website: http://www.cils4.eu/images/wave1_material/master/w1_ym_master.pdf.

TABLE 1 | Sample distributions, means and standard deviations (in parentheses) for major mediating variables.

	Underweight		Normal weight		Overweight		All	
Boys	143	2.0%	5,425	75.4%	1,624	22.6%	7,192	100.0%
Ethnic origin								
Native born	89	62.2%	3,325	61.3%	842	51.8%	4,256	59.2%
Western Europe	5	3.5%	283	5.2%	105	6.5%	393	5.5%
Eastern Europe	13	9.1%	425	7.8%	166	10.2%	604	8.4%
Sub-Saharan Africa and Caribbean	10	7.0%	255	4.7%	53	3.3%	318	4.4%
Middle East and Northern Africa (MENA)	20	14.0%	897	16.5%	390	24.0%	1,307	18.2%
Asia	6	4.2%	140	2.6%	46	2.8%	192	2.7%
Others	0	0.0%	100	1.8%	22	1.4%	122	1.7%
Social factors								
Parent-child relations (range 1–5)	3.99	(0.61)	3.93	(0.71)	3.81	(0.77)	3.92	(0.72)
Teacher-child relations (1–5)	3.22	(0.81)	3.28	(0.92)	3.22	(0.94)	3.26	(0.94)
Peer relations (1–4)	3.56	(0.60)	3.73	(0.52)	3.67	(0.58)	3.71	(0.54)
Psychological factors								
Self-esteem (1–5)	4.01	(0.57)	4.13	(0.57)	4.09	(0.63)	4.11	(0.60)
Mental state (1–4)	3.15	(0.70)	3.38	(0.63)	3.27	(0.71)	3.34	(0.66)
Girls	134	1.9%	6,222	86.4%	848	11.8%	7,204	100.0%
Ethnic origin								
Native born	90	67.2%	3,681	59.2%	471	55.5%	4,242	58.9%
Western Europe	8	6.0%	333	5.4%	45	5.3%	386	5.4%
Eastern Europe	7	5.2%	545	8.8%	69	8.1%	621	8.6%
Sub-Saharan Africa and Caribbean	4	3.0%	296	4.8%	42	5.0%	342	4.7%
Middle East and Northern Africa	17	12.7%	1,071	17.2%	195	23.0%	1,283	17.8%
Asia	7	5.2%	188	3.0%	13	1.5%	208	2.9%
Others	1	0.7%	108	1.7%	13	1.5%	122	1.7%
Social factors								
Parent-child relations (1–5)	3.90	(0.88)	3.93	(0.81)	3.89	(0.85)	3.92	(0.82)
Teacher-child relations (1–5)	3.38	(0.87)	3.32	(0.85)	3.38	(0.88)	3.34	(0.86)
Peer relations (1–4)	3.70	(0.56)	3.74	(0.50)	3.59	(0.66)	3.72	(0.53)
Psychological factors								
Self-esteem (1–5)	3.88	(0.67)	3.85	(0.67)	3.72	(0.74)	3.83	(0.69)
Mental state (1–4)	3.01	(0.81)	2.97	(0.78)	2.83	(0.86)	2.96	(0.79)

Sources: CILS4EU, wave 1, weighted data, authors' calculations.

1 Higher values pertain to more positive/favourable characteristic on each of the respective variables.

2 Row percentages are reported for "Boys" and "Girls." column percentages are reported for ethnic origin breakdown.

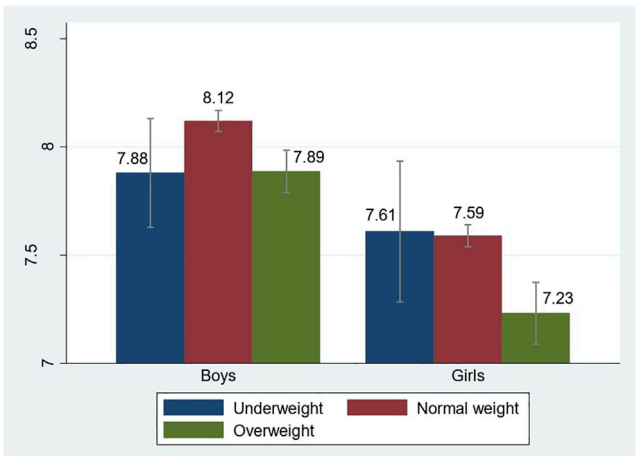

FIGURE 1 | Life satisfaction by body mass index and gender.

with the widely documented gender gap in life satisfaction, life satisfaction in general is much lower among girls than among boys in our data.

MULTIVARIATE ANALYSES

In all models presented in this section, we control for fixed effects at the level of survey countries (Germany used as a reference category).[9] All model estimations are processed by using analytical weighting. A single weight variable, which combines multi-stratum sampling weights, adjustments for non-responses rates, as well as rescaling to reflect the actual sample size, is used for this purpose (see more details in the CILS4EU technical report[10]). Missing values are deleted pairwise, as different models include different sets of variables.

In **Table 2**, we explain the BMI-LS association by establishing the relative importance of social and psychological mediating factors. The baseline model (Model 1) includes respondents' socio-demographic characteristics, such as age, ethnic origin, migration status, social background and country of residence. We just point out that each model is run twice, for boys and girls

[9]Due to reduced sample sizes we do not carry separate analyses by countries.

[10]https://www.cils4.eu/images/wave1_material/technical/za5353_technicalreport_wave1.pdf

TABLE 2 | Coefficients of body weight across OLS regressions on life satisfaction by gender in Germany, Sweden and the Netherlands.

	Boys (normal weight−ref.)							Girls (normal weight−ref.)						
	Underweight		Overweight		Obs #	R^2		Underweight		Overweight		Obs #	R^2	
	Coef.	SE[a]	Coef.	SE[a]		Cross-model comparison (p)[b]		Coef.	SE[a]	Coef.	SE[a]	–	Cross-model comparison (p)[b]	
Model 1 (socio-demographics)	−0.27	(0.17)	−0.21*	(0.10)	6,435	0.04	–	−0.02	(0.23)	-0.34**	(0.12)	6,378	0.03	–
Model 2 (M1 + parents)	−0.34*	(0.16)	−0.09	(0.09)	6,216	0.13	0.25	0.02	(0.21)	−0.29**	(0.10)	6,203	0.20	0.58
Model 3 (M1 + teachers)	−0.26	(0.18)	−0.20+	(0.10)	6,418	0.05	0.87	−0.05	(0.22)	−0.35**	(0.12)	6,371	0.06	0.53
Model 4 (M1 + peers)	−0.21	(0.16)	−0.17+	(0.10)	6,422	0.07	0.14	0.01	(0.24)	−0.23+	(0.12)	6,364	0.05	0.00
Model 5 (M1 + all social factors)	−0.29+	(0.16)	−0.07	(0.09)	6,190	0.16	0.95	0.02	(0.21)	−0.23*	(0.11)	6,184	0.22	0.10
Model 6 (M1 + self-esteem)	−0.20	(0.17)	−0.10	(0.11)	6,425	0.14	0.58	−0.15	(0.19)	−0.07	(0.12)	6,370	0.18	0.00
Model 7 (M1 + mental state)	−0.06	(0.18)	−0.12	(0.11)	6,420	0.15	0.03	−0.06	(0.21)	−0.17	(0.11)	6,373	0.28	0.01
Model 8 (M1 + all psychological factors)	−0.06	(0.18)	−0.06	(0.11)	6,410	0.20	0.09	−0.12	(0.19)	−0.07	(0.11)	6,366	0.31	0.00
Model 9 (M1 + social + psychological)	−0.14	(0.15)	−0.01	(0.10)	6,173	0.24	0.06	−0.07	(0.19)	−0.07	(0.10)	6,174	0.35	0.00

Sources: CILS4EU, wave 1, weighted data, authors' calculations.

**p < 0.01, +p < 0.05, + p< 0.10. The following variables are also controlled in the models: survey country, age, origin groups, generational status, parental education, and type of household.*

[a]Standard errors, presented in the second column, are in parenthesis.

[b]The level of significance (shown by the p value) of the change in respective coefficients for the dummy-coded variable "underweight" and "overweight" ("normal weight" as the reference category) in Models 2–9 compared to Model 1 is indicated in the column of "cross-model comparison (p)".

respectively, due to the cross-gender incomparability regarding the BMI-LS association, as aforementioned. Model 1 confirms the aforementioned inverse U-shaped pattern with both underweight and overweight boys being less satisfied with their lives compared to their normal-weight counterparts, though the coefficient is only significant for overweight boys. The same significant pattern is observed among girls. Also the gap of life satisfaction between overweight and normal weight girls is larger than that between overweight and normal weight boys.

From Models 2 through 4, the variables capturing social relations are taken into account. Comparing Models 2 and 1, one can see that the inclusion of relations with parents changes the patterns of the BMI-LS association for both underweight and overweight boys. With the quality of relations with parents, as well as other covariates, being equal, underweight boys are, on average, significantly less satisfied than normal-weight boys with their lives, whereas the negative association between being overweight and life satisfaction is no longer significant. This means that among boys, those underweight ones actually run a higher risk of feeling unsatisfied than their overweight counterparts. This difference is disguised, because underweight boys might receive more protection and support from their parents whereas overweight boys might feel more pressure from their parents. Models 3 and 4 show that controlling for relations with teachers and peers does not change the level of life satisfaction for underweight boys significantly, but does make the lower level of life satisfaction only marginally significant for overweight boys. This means that those relationships do not matter significantly in mediating the BMI-LS association for underweight boys, whereas they do matter to a certain degree for overweight boys. Among girls, controlling for social relations does not change the patterns of association between life satisfaction and body weight for both underweight and overweight girls. A single exception is that relations with peers seem to attenuate the strength of association between body weight and life satisfaction for overweight girls.

Model 5 controls for social relations in all three respects. It shows that after qualities of social relations with parents, teachers and peers, as well as other covariates were controlled, underweight boys indeed feel less satisfied than their normal-weight counterparts with their lives, only at the level of marginal significance. By contrast, overweight boys are not significantly less satisfied than normal-weight boys. Differences between Models 5 and 1 indicate that while underweight boys have real concerns about their body weight, high-quality relations with their parents play a crucial role in boosting their life satisfaction. On the contrary, while overweight boys do not really concern about their body weight itself, poor qualities of their social relations, particularly with parents, drive their dissatisfaction with lives. Patterns for girls are different. Social relations do not seem to matter for life satisfaction of underweight girls. For overweight girls, the inclusion of peer relations reduces the gap of life satisfaction relative to normal-weight girls the most (from −0.34 to −0.23). The second important mediator is their relations with parents. However, life satisfaction of overweight girls remains significantly lower than their normal-weight counterparts, with all aspects of social relations taken into account.

TABLE 3 | Coefficients of body weight across OLS regressions on life satisfaction among adolescent girls in Germany, Sweden and the Netherlands, interactions with ethnic origin.

	Model 10 (socio-demographics)		Model 11 (M1 + social factors)		Model 12 (M1 + psychological factors)		Model 13 (M1 + social + psychological factors)	
Underweight	–0.08	(0.25)	–0.03	(0.25)	–0.12	(0.23)	–0.07	(0.24)
Overweight	–0.31*	(0.14)	–0.26*	(0.12)	–0.04	(0.13)	–0.07	(0.12)
Western Europe	0.25	(0.21)	0.03	(0.19)	-0.11	(0.17)	-0.15	(0.16)
Eastern Europe	0.17	(0.18)	0.15	(0.14)	-0.20	(0.14)	–0.11	(0.13)
Sub-Saharan Africa and Caribbean	0.26	(0.21)	0.25	(0.20)	–0.27	(0.23)	-0.19	(0.19)
MENA	0.10	(0.15)	0.06	(0.13)	–0.28*	(0.12)	–0.22+	(0.13)
Asia	–0.16	(0.20)	-0.02	(0.18)	–0.45**	(0.17)	–0.31*	(0.17)
Underweight *								
Western Europe	–0.18	(0.64)	0.11	(0.50)	–0.30	(0.65)	0.13	(0.58)
Eastern Europe	0.90*	(0.40)	0.69*	(0.35)	0.31	(0.40)	0.32	(0.36)
Sub-Saharan Africa and Caribbean	–0.46	(0.48)	–0.88*	(0.40)	–1.00+	(0.56)	–1.14*	(0.49)
MENA	–0.26	(0.78)	0.00	(0.67)	–0.22	(0.67)	–0.07	(0.55)
Asia	1.27	(1.24)	0.65	(0.74)	0.51	(0.78)	0.31	(0.61)
Overweight *								
Western Europe	0.06	(0.39)	0.40	(0.28)	0.07	(0.27)	0.25	(0.27)
Eastern Europe	–0.16	(0.36)	0.41	(0.32)	–0.01	(0.29)	0.21	(0.29)
Sub-Saharan Africa and Caribbean	–0.58	(0.43)	–0.36	(0.40)	–0.43	(0.53)	–0.28	(0.50)
MENA	–0.07	(0.43)	–0.01	(0.35)	–0.22	(0.35)	–0.14	(0.33)
Asia	–0.64	(1.65)	–0.89	(1.77)	–0.06	(1.21)	–0.31	(1.37)
Obs #	6,378	—	6,184	—	6,366	—	6,174	—
R^2	0.03	—	0.22	—	0.31	—	0.35	—

Sources: CILS4EU, wave 1, weighted data, authors' calculations.

$p < 0.05$;+< 0.10. The following variables are also controlled in the models: survey country, age, origin groups, generational status, parental education, and type of household.

From Models 6 to 8, psychological factors are included one by one and then together. Results show that controlling for psychological factors changes the effect sizes and the levels of significance of BMI coefficients for both overweight boys and girls. At same levels of self-esteem and mental stability and with other covariates being equal, overweight youth are no longer significantly less satisfied with their lives than their normal weight counterparts. This implies that overweight youth's low life satisfaction essentially reflects self-perceptions driven by their low levels of self-esteem and mental stability. In the final model (Model 9), we account for both social relations and psychological factors, and it does not change the established patterns shown in Model 8.

To summarize, with only socio-demographic traits taken into account, patterns of the BMI-LS relationship are closely in line with those presented in **Figure 1** for both boys and girls. Between the psychological and social factors, the former aspect seems to play a more important role, as accounting for psychological factors changes the pattern of BMI-LS association substantially for both boys and girls. This can be seen from cross-model ttest results, which show significant differences in BMI coefficients before and after the inclusion of psychological factors. Social relations seem to operate for underweight and overweight boys in opposite ways, though results of the t-test across models suggest that the inverse U-shaped pattern of the BMI-LS association remains among boys, whether social relations are controlled or not. For girls, the inclusion of peer relations reduces the negative BMI-LS association significantly in the overweight group, when we compare BMI coefficients between Models 4 and 1 ($p = 0.00$). Even after accounting for all types of social relations, life satisfaction of overweight girls remains significantly lower.

Building on the literature about normative perceptions, we further examine whether the BMI–LS association also varies with youth's migration background. We have run analyses for both gender groups, and noteworthy patterns are only found among girls, as presented by **Table 3**. Other covariates being equal, overweight girls report significantly lower life satisfaction than their normal weight counterparts. This significant difference remains when social relations are taken into account, but disappears once psychological factors are included. Those findings are consistent with what **Table 2** presents. More nuanced patterns are revealed by **Table 3**, however. The inclusion of psychological factors is associated with a significant regional difference, with girls originating from MENA and Asia being less satisfied with their lives compared to their native-born counterparts, though the lower life satisfaction of MENA girls is only marginally significant after social relations are also included.

There are also regional differences in girls' perceptions of being underweight, but not of being overweight. Compared to native-born girls, being underweight is associated with a higher level of life satisfaction among girls originating from Eastern Europe, though such a difference becomes non-significant once psychological factors are taken into account. Substantially lower levels of life satisfaction are found among underweight girls from Sub-Saharan Africa and the Caribbean, with all covariates being equal. This implies: 1) that girls originating from Sub-Saharan Africa and the Caribbean may carry norms of beauty somewhat different from those in mainstream Western societies, as they do

TABLE 4 | Ordinal Logistic Regression models on life satisfaction by gender in Germany, Sweden and the Netherlands.

	Boys (normal weight—ref.)						Girls (normal weight—ref.)					
	Underweight		Overweight		Ob#	Log pseudolikelihood	Underweight		Overweight		Ob#	Log pseudolikelihood
	Coef.	SE	Coef.	SE			Coef.	SE	Coef.	SE		
Model 14 (socio-demographics)	−0.40*	(0.20)	−0.21*	(0.10)	6,435	−6,798	0.03	(0.22)	−0.32**	(0.11)	6,378	−6,938
Model 15 (M1 + parents)	−0.59**	(0.19)	−0.08	(0.09)	6,216	-6,154	0.06	(0.24)	−0.32**	(0.11)	6,203	−6,084
Model 16 (M1 + teachers)	−0.41*	(0.19)	−0.21*	(0.10)	6,418	−6,687	−0.00	(0.23)	−0.35**	(0.12)	6,371	−6,809
Model 17 (M1 + peers)	−0.33+	(0.19)	−0.17+	(0.10)	6,422	−6,684	0.09	(0.23)	−0.20+	(0.11)	6,364	−6,800
Model 18 (M1 + all social factors)	−0.52**	(0.18)	−0.05	(0.09)	6,190	−6,012	0.10	(0.23)	−0.26*	(0.12)	6,184	−5,974
Model 19 (M1 + self-esteem)	−0.31	(0.24)	−0.08	(0.11)	6,425	−6,323	−0.13	(0.23)	−0.10	(0.13)	6,370	−6,417
Model 20 (M1 + mental state)	−0.09	(0.25)	−0.10	(0.11)	6,420	−6,349	0.08	(0.22)	−0.23+	(0.12)	6,373	−6,016
Model 21 (M1 + all psychological factors)	−0.07	(0.28)	−0.02	(0.12)	6,410	−6,061	-0.03	(0.23)	−0.12	(0.13)	6,366	−5,878
Model 22 (M1 + social + psychological)	−0.25	(0.23)	0.06	(0.11)	6,173	−5,610	0.02	(0.23)	−0.11	(0.13)	6,174	−5,446

Sources: CILS4EU, wave 1, weighted data, authors' calculations.

***p < 0.01, *p < 0.05, + p< 0.10. The following variables are also controlled in the models: survey country, age, origin groups, generational status, parental education, and type of household. Standard errors, presented in the second column, are in parenthesis.*

not perceive an overly slim body as the ideal body image; and 2) that social and psychological factors both play significant buffering roles in alleviating the negative perceptions of being underweight among teen girls with roots in this area. In **Supplementary Table S2** of the Appendix, we have conducted the robustness check by using the alternative grouping method for the three BMI groups, and our major findings remain consistent (about lower levels of life satisfaction among girls originating from MENA and Asian areas, and more importantly, about lower life satisfaction of underweight girls from Sub-Saharan African and Caribbean areas). Nevertheless, coefficients for the main effect of being overweight and for underweight girls originating from Eastern Europe are no longer significant. Extra caution is therefore required when researchers generalize ethno-racially specific results shown by **Table 3**.

SENSITIVITY ANALYSIS

In addition to examining life satisfaction as a continuous variable, we have also collapsed ten points of life satisfaction into three groups, namely, "unsatisfied" including everyone who reported a life satisfaction score lower than 8, "satisfied" referring to respondents reporting the median value of life satisfaction (8), and "very satisfied" including all respondents reporting life satisfaction scores higher than 8. We subsequently ran the Ordinal Logistic Regression modelling on the new three-group "life satisfaction" variable. Results strongly resonate with those presented in **Table 2**.

As **Table 4** shows, among boys, the BMI-LS association shown in Model 14 follows an inverse U-shaped pattern. Social relations play opposite roles in mediating the BMI-LS association among underweight and overweight boys. A comparison between Models 18 and 14 reveal that accounting for social relations enhances the negative BMI-LS association for underweight boys but decreases that association for overweight boys to the level of non-significance. This suggests, as aforementioned, that social relations play a positive role in boosting underweight boys' life satisfaction. As for overweight boys, they would not have felt dissatisfied if it were not for poor qualities of social relations they experience.

Among girls, confirming results presented above, Model 14 shows that overweight girls are less satisfied than their normal weight counterparts, whereas there is no significant difference in life satisfaction between underweight and normal weight girls. The comparison between Models 18 and 14 reveals that the life satisfaction gap between overweight and normal weight girls remains even with social relations taken into account, though the inclusion of social relations does account for the life satisfaction gap to some extent.

From Models 19 through 22, the inclusion of psychological traits turns the BMI-LS associations to non-significant for both boys and girls. This confirms the essential role psychological traits play in differentiating youth's self-perceptions of body weight, which in turn, is associated with different levels of life satisfaction.

SUMMARY AND CONCLUSION

The period of adolescence is marked by numerous challenges, due to physiological and psychological transitions, as well as life events typically occurring at this stage, such as dating and changing relationships with parents. Coping with all the challenging situations might leave imprints on young people's subjective well-being. In this study, we examined one specific aspect, the relationship between adolescents' body weight/size and life satisfaction.

Our findings have shown that patterns of the BMI–LS association observed in the US and other contexts also hold true for adolescents in three European countries—Germany, the Netherlands and Sweden. There is an inverse U-shaped relationship between boys' BMI and life satisfaction, though the life satisfaction gap is more

salient between underweight and normal weight boys, and non-significant or only marginally significant between overweight boys and their normal weight counterparts. Moreover, the association between being underweight and life satisfaction among girls varies across ethno-racial groups. Girls originating from Eastern Europe have a tendency to gain more life satisfaction when being underweight, whereas girls rooted in Sub-Saharan African and Caribbean countries display consistently low levels of life satisfaction when being underweight. Those findings well reflect the normative nature of body weight/size perceptions. By and large, both native-born and immigrant youth's perceptions of their bodies are dominantly shaped by the cultural norm cultivated in Western countries, which endorses a strong male body and a slender female body as ideal body images (except for those originating from Sub-Saharan Africa and the Caribbean).

As aforementioned, one of the major limitations of this study is the small sizes of underweight groups for both boys and girls, which imposes particular challenges when the BMI-LS association further intertwines with ethnic origin. Fortunately, the use of the alternative grouping methods for the three BMI categories (in the **Supplementary Table S2**) proves the robustness of major findings presented by our main analyses.

We want to point out that BMI does not differentiate between fat and muscle tissue (Cohane and Pope, 2001). It is likely that BMI in the overweight range is due to excessive muscles rather than fat, particularly among boys. This might explain why no significantly negative association is found between being overweight and life satisfaction among boys. In addition, physical changes teen boys go through are likely to lead to lean body shapes (Linna et al., 2013), corresponding to our finding on boys' discontent about being underweight rather than overweight.

In terms of social mediating factors, relationships with parents (particularly among boys) and relationships with peers (particularly among girls) play significant roles. Those findings suggest the importance of social policies on enhancing the parent-child relation in the domestic arena as well as combatting bully behaviour in the public arena in improving subjective well-being of adolescents, particularly who have weight concerns. Psychological factors, captured by mean scores of items related to self-esteem and mental state, explain the association between BMI and life dissatisfaction substantially, for both boys and girls. Due to its cross-sectional nature, our study is unable to solve the causal puzzle of whether individuals with low self-esteem, depressive state or low subjective well-being tend to develop weight-related problems or, reversely, whether societally "unacceptable" weight conditions lead to lower self-esteem, depressions or lower life satisfaction (Markowitz et al., 2008). Future research utilizing panel data sets on this topic is very much needed. Regardless, such finding highlights that youth's self-perceptions of their bodies are inherently associate with their levels of self-esteem and mental stability. Namely, being either overweight or underweight does not necessarily hurt youth's life satisfaction, as long as they do not internalize the "standard" advocated by social media and popular culture. Policies and other resources, which target at strengthening youth's self-confidence, cultivating their awareness of self-worthiness and sustaining their mental health at multiple levels (such as home, school and society), are thus of great importance.

The self-reporting of BMI is prone to criticism as well (Villanueva, 2001; Kronenfeld et al., 2010). Research shows that adults tend to under-report their weight and over-report their height (Elgar et al., 2005; Wardle et al., 2006; Brunner Huber, 2007; Sherry et al., 2007). Girls seem to be more likely to under-report weight than boys (Sherry et al., 2007). However, our findings about girls reveal that the significant group difference in the BMI-LS association only exists between those who are overweight and those who are not. Namely, if systematic biases existed in our estimations, those biases would only make coefficients harder to be significant, supporting the robustness of those patterns presented in the text.

Above all, this study demonstrates the existence of significant relationships between body weight/size and life satisfaction, using data beyond the American context. It also sheds light on the importance of mediating factors in the BMI-LS association, including social and psychological factors as well as ethno-racial diversity. Future research is much needed to deepen scholarly understanding about the formation of normative perceptions of body shape; for example, to reveal the unknown roles of social media and popular culture in internalizing the westernized body weight/size norm, to explore the interplay between external social influences and internal psychological factors in shaping youth's normative perceptions, and to further detangle how the mediating roles played by all those factors differ across ethno-racial groups. We hope findings from the current study serve as a stepping-stone to advance this line of research.

DATA AVAILABILITY STATEMENT

The datasets presented in this study can be found in online repositories. The names of the repository/repositories and accession number(s) can be found below: https://www.cils4.eu/.

AUTHOR CONTRIBUTIONS

IK and JS have both conducted data analyses for this study. In terms of the completion of the manuscript, IK took the lead at the early stage and JS took the lead for the submission to this special issue. They both contributed to the manuscript substantially.

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Migrants' Social Integration and Its Relevance for National Identification: An Empirical Comparison Across Three Social Spheres

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A key element of migrants' well-being is their emotional integration, that is, the extent to which they perceive themselves as members of society and their identification with the country they are living in. To foster this sense of belonging, many integration programs aim to increase the migrants' social integration, for example, by organizing events for migrants to meet natives in various settings. The validity of this strategy is supported by decades of international research. It remains unclear, however, which aspects of social integration are most relevant for national identification. Multiple theories concerned with contact and group identification support the assumption that contact to natives should foster a sense of belonging and national identification. However, for a contact situation to bear this potential, a certain set of criteria, including aspects like direct personal contact, a similar social status, and the presence of egalitarian norms, needs to be fulfilled. It is expected that these characteristics are more likely to be fulfilled within family and friendship settings than in contact situations within the employment context. Hence, I expect contact to natives within the network of friends and family to be more greatly associated with migrants' national identification. I analyzed data from a 2013 cooperation between the Institute for Employment Research (IAB) and the German Socio-Economic Panel (SOEP), that is, the IAB-SOEP Migration Sample, as well as the 2014 wave of the SOEP. The subsample used included 2,780 first- and second-generation migrants living in Germany. The results indicate that not all kinds of contact are equally linked to national identification. In contrast to expectations, in neither the cross-sectional models nor the lagged models was living together with native family members significantly linked to national identification. Similarly, the association between having predominantly native co-workers and national identification was insignificant when controlling for migrant-specific characteristics. Only the relation with having predominantly native friends was significant and positive across all models. This as well as a comparison of the associations lead to the conclusion that when it comes to migrants' national identification native friends might be the most relevant form of contact to natives.

Keywords: national identification, emotional integration, social integration, contact, Germany

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INTRODUCTION

In recent decades the integration of migrants has become a prominent challenge for many Western and non-Western societies. And with this development more and more sociological research has focused on migrants' integration as well. Many researchers in the past have focused on cultural, social, and structural integration, by asking which determinants lead to the assimilation of migrants' concerning their knowledge and skills, their social networks, and their positions in society (e.g., Bevelander and Veenman, 2006; Martinovic et al., 2009a; Hochman, 2011; Fokkema and Haas, 2015; Kalmijn and Kraaykamp, 2018). Besides that, there is a line of research focusing on migrants' emotional integration, namely their sense of belonging and identification with the new society they are a part of. However, within this line of research there are still many uncertainties. This is specifically true with regard to explaining migrants' emotional integration with quantitative research using adult samples.

This is unfortunate because emotional integration is a key element for migrants' well-being. In addition, emotional integration is not only of great relevance for the individual migrant; rather, the whole society benefits from migrants having high levels of emotional integration. This is because high levels of emotional integration, specifically national identification, can be considered the basis for national solidarity and an overall effective democracy (Barry, 2002; Putnam, 2007; Verkuyten and Martinovic, 2012). Existing studies on emotional integration have looked for key determinants. Social integration, that is, the contact to society members without a migration background, appears to be one of them. Within this area of contact to natives there have been, among others, studies on the contact to native neighbors (e.g. de Vroome et al., 2014), specific school settings (e.g. Agirdag et al., 2011), and the composition of friendship networks (e.g. Walters et al., 2007).

However, previous research focused on individual aspects of social integration rather than analyzing the influence of different aspects simultaneously and comparing their relevance for national identification. It is therefore unclear, which aspects of social integration are most relevant. Yet, to increase migrants' national identification and, therefore, their well-being and to develop integration policies and programs, it is vital to understand which aspects of social integration are most relevant. Only when this knowledge is acquired can effective integration policies, programs, and interventions based on contact to natives be designed. My aim it to fill this gap by inspecting the influence of various kinds of contacts to natives on national identification simultaneously and comparing the respective effects empirically. Specifically, I will describe and compare the relationships between family, friendship, and workplace settings and national identification.

In a first step, I will present some theoretical considerations on the concept of emotional integration. Further, I will discuss previous studies on the relation of social and emotional integration. Based on this theoretical background and additional theories, concrete expectations for the results will be stipulated in form of testable hypotheses. Subsequently, after presenting the dataset used as well as the methods applied, I will analyze and compare the relationship between different forms of social integration and national identification. The article will conclude with a discussion of the results as well as potential limitations of the study.

Emotional Integration and Integration Theory

Emotional integration has been described as the emotional relationship between a migrant and the social system (Esser, 2001). This emotional relationship can also be understood as the degree to which migrants hold a collective sense of togetherness or national pride (Esser, 2001; Hochman, 2010). Overall, emotional integration aims to capture migrants' sense of belonging to the society of the country they are residing in.

In the last decades, different approaches to measure emotional integration have been developed. These include the widely accepted Collective Self-Esteem Scale (CSES) (Luhtanen and Crocker, 1992), which is based on Tajfel and Turner's (1986) concept of social identity (see also Crocker et al., 1994; Kim and Omizo, 2005; Gangadharbatla, 2008; Agirdag et al., 2011). Another, less theory-driven, approach investigated migrants' behavior to gather information on their emotional integration (Becker, 2009). Both approaches, however, can be difficult to implement because they require very specific data structures, which almost exclusively are obtained by data gathered for specific research projects. Another common and, in many cases, more feasible way to measure emotional integration is by means of national identification (Walters et al., 2007; Hochman, 2010; Maliepaard et al., 2010; Hochman and Davidov, 2014). Variables indicating respondent's levels of national identification can often be found in large surveys, such as the European Social Survey (European Social Survey, 2018) or the German Socio-Economic Panel (SOEP), which asks respondents "To what extent do you feel German?" (TNS Infratest Sozialforschung, 2014). Throughout the rest of the article, national identification will be used to describe emotional integration unless otherwise specified.

Integration theories suggest a strong relation between other forms of integration and national identification (Esser, 2001; Nauck, 2001). These forms include: 1) structural integration—the migrants position in society and its core institutions (Heckmann, 2005), 2) cultural integration—the acquisition of knowledge, skills, attitudes and behaviors specific to a certain country or region (Heckmann, 2003) and 3) social integration—(regular) contact to and interactions with natives (Haug, 2003; Martinovic et al., 2009b). These relations are suggested to be causal, with national identification being seen at the end of the overall integration process (Esser, 2001; Nauck, 2001). This is because it is assumed that structural and cultural assimilation as well as general contact to natives increase migrants' possibilities for participating in society and therefore help increase their sense of belonging and national identification (Esser, 2001).

Previous Research on the Link Between Social Integration and National Identification

In the recent past, many studies investigating these relations supported the assumption of a close relationship between different forms of integration and national identification. Concerning structural integration, factors like naturalization, and entitlement to vote were identified as being relevant for migrants' national identification (Ono, 2002; Walters et al., 2007; Fick, 2016), and with regard to cultural integration, language acquisition was found to be highly influential (Jasinskaja-Lahti and Liebkind, 1998; Remennick, 2004; de Vroome et al., 2014; Hochman and Davidov, 2014).

However, only few researchers were specifically interested in the effect of contact to natives on national identification in adults. Many researchers focused on children or when using adult samples merely included aspects of social integration as control variables into their models when analyzing the influence of other characteristics on national identification. Nonetheless, their work can be used to study the effect. Therefore, in the following, both studies explicitly focusing on the relation between social integration and national identification as well as studies indirectly contributing will be discussed.

Research including variables indicating the occurrence of contact to natives generally were able to show that migrants' national identification was strongly linked to increased contact to natives in everyday life (Hochman, 2010; de Vroome et al., 2011; Tolsma et al., 2012; Hochman and Davidov, 2014). While these studies provide a first indication of the relevance of social integration, more information on the effect of contact in various settings is necessary to learn about the potential differences in the effects.

One setting that has been explored further with respect to the relation between social integration and national identification is the neighborhood. For instance, in a sample of Caribbean and South Asian migrants in Britain, Maxwell (2009) indicated that those living in ethnically diverse neighborhoods in two out of three measurement time points (2003, 2005) exhibited the same level of national identification as those living in neighborhoods comprised of only members of their own ethnicity. In 2007, those living in diverse neighborhoods were less likely to report high levels of national identification. However, due to the strict definition of diversity, this variable had little variance. In both ethnic groups as well as over the three time points, more than 91% of respondents reported living in diverse neighborhoods. Instead of looking at the general composition on the neighborhood, de Vroome and colleagues (2014) analyzed the relation between national identification and contact to native neighbors specifically. Whereas migrants indicating more contact to native neighbors showed significantly higher levels of national identification, this relation was not very strong and could only be observed in first-generation migrants (de Vroome et al., 2014). Second-generation migrants' identification was not associated with the amount of contact to native neighbors, which was generally reported to be quite high across members of this group (de Vroome et al., 2014).

A more personal sphere, and the sphere most frequently applied, are migrants' friends and friendship networks. Specifically, many studies utilized information on the ethnic composition of the migrants' friendship networks (Lubbers et al., 2007; Walters et al., 2007; Maxwell, 2009; Hochman, 2010; Hochman and Davidov, 2014). In a sample of Puerto Ricans living in New York who reported the majority of their friends to be non-Hispanics, Oropesa et al. (2008) reported an increase in pan-ethnic over ethnic self-labeling. Similarly, Lubbers et al. (2007) found that with increasing percentages of native friends, the likelihood for immigrants in Spain to report generic rather than ethnic identification increased substantially. While these two studies focused on ethnic and pan-ethnic rather than national identification in the sense of identifying with the migrants' (new) place of residency, Maxwell (2009) explicitly investigated the relation between migrants having friends outside their own ethnic group and their sense of belonging to Britain. As expected, migrants with interethnic friendship networks reported a considerably stronger sense of belonging to Britain than those whose friendship networks were exclusively intraethnic (Maxwell, 2009). Comparable results were also found for Canada and Germany, with respondents with higher shares of native friends also reporting higher levels of national identification (Walters et al., 2007; Hochman, 2010; Hochman and Davidov, 2014).

In addition to these studies on adult migrants, there is also a line of research focusing on national identification in migrant children and adolescents. While some studies in this field confirm the results found in studies with adults (Phinney et al., 2006; Sabatier, 2008; Agirdag et al., 2011; Munniksma et al., 2015; Fleischmann and Phalet, 2018), others did not find this relation in their samples (Leszczensky, 2013; Leszczensky et al., 2016; Leszczensky, 2018). Therefore, in children the relation between having native friends and national identification appears to be more disputed, especially since the studies indicating no relation tended to use longitudinal analyses strategies, which are more suitable for analyzing causation[1]. Another interesting result from studies focusing on children is that the significance and strength of the relation between friendship network composition and national identification might differ between ethnic groups (Leszczensky, 2013; Schulz and Leszczensky, 2016). While for young migrants with southern European and former Yugoslavian roots the relations were in line with those commonly found in adults, the effect was not statistically significant for those of Polish and Turkish descent (Schulz and Leszczensky, 2016). This

[1]The issue of causation is a general problem in many studies analyzing the relation between contact to natives and national identification. Most research so far, especially with regard to adults, used cross-sectional data and can therefore only report on the general link between the two concepts. Cross-sectional analyses are unable to identify whether it is having native friends that influences national identification or national identification that influences having native friends. An article by Leszczensky et al. (2019) provides an overview over this issue by highlighting theoretical considerations concerning the link between the two concepts as well as discussing studies using different methodological approaches. The latter with a special focus on studies with school children rather than adult samples.

indicates that different migration backgrounds should be accounted for when researching the link between having native friends and national identification.

Further, researchers considered the contact to natives within the migrants' immediate families. This sphere is most likely the most personal one, as it considers migrants' choice in relationship partners. Results from Germany as well as the Netherlands indicated that migrants having a native partner display substantially higher levels of national identification than those who have partners sharing the same ethnicity (Rother, 2008; de Vroome et al., 2011). With similar results, but a different approach focusing on emotional integration rather than national identification, Becker (2009) and Gerhards and Hans (2009) also came to the conclusion that those with native partners were more likely to be emotionally integrated. Besides having a native partner, living together with a native in general appeared to have a positive effect on national identification (Fick, 2016).

As can be deduced from the presented studies, most research focused on spheres in which migrants are able to choose whether to have contact to specific others or not to engage in such contacts. Having a native partner and having native friends are choices made by the individual. Similarly, having contact to natives within the neighborhood can also be seen as a voluntary act, however, perhaps to a lesser extent than that of friendship and partner formation. To compare the relevance of different spheres, it would also be interesting to discuss settings in which migrants have no or relatively little influence on the composition of their network. One example for such a setting would be their place of work and the ethnic composition of their colleagues. Unfortunately, this context has been neglected to date. What exists, however, is research on the relation between schools' ethnic compositions and the national identification of adolescent migrants (Sabatier, 2008; Agirdag et al., 2011). Similar to situations where employees have little influence on the ethnic composition of the workforce they are a part of, pupils have little influence on the school and class composition. Therefore, results from studies conducted in schools could give first insights into the relevance of contact to natives in settings in which no or little individual choice concerning the contact is possible. Two studies conducted in Belgium and France used the percentage of native students at school as explanatory variables (Sabatier, 2008; Agirdag et al., 2011). Both came to the conclusion that while the composition initially appeared to be relevant for the national identification of students with a migration background, after controlling for aspects such as interethnic friendships and ethnicity, the relation lost its statistical significance (Sabatier, 2008; Agirdag et al., 2011). This would suggest that when controlling for other factors, the ethnic composition of networks in which individuals do not choose their counterparts might exhibit no or only a weak effect when compared to contact in other settings.

However, while the composition of the school did not exert statistically significant correlations with national identification, both studies highlight the relevance of friendships formed between migrant and native adolescents (Sabatier, 2008; Agirdag et al., 2011). This emphasizes the importance of including multiple aspects of social integration into analyses. Besides Sabatier (2008) and Agirdag et al. (2011) other researchers also opted for the inclusion of multiple aspects. De Vroome et al. (2011), for example, included three different aspects into their analyses on refugees national identification—whether they had at least one Dutch friend, whether half or more of their general social contacts were Dutch, and whether they had a Dutch partner. All three aspects correlated with national identification to a noteworthy degree and on a statistically significant level. Similarly, Gerhards and Hans (2009) included general contact (being visited by or having received visits from native Germans) as well as friendship aspects (at least one of the closest three friends is native German) and inter-marriage into their models. Again, all three aspects were substantial and statistically significant; however, intermarriage lost its statistical significance upon controlling for German citizenship. In neither of the two studies were simple comparisons of the coefficients possible, as no standardized effect sizes were provided and the authors did not discuss the differences in the coefficients size. Hochman and Davidov (2014), however, did include standardized effects in their work on the relation of language proficiency and national identification. As control variables they included the general visitation and friendship measures already used by Gerhards and Hans (2009). While both effects were substantially and statistically significant, the effect for general contact appeared to be slightly larger. However, it was not possible to determine whether this difference was statistically significant.

Overall, previous research has shown the importance of contact for migrants' national identification across several different settings. From research including multiple factors, first indications for potential differences in the effects of various spheres can be drawn. However, due to the variations in the scale of the included variables, these comparisons suffer from limited comparability. In the next paragraphs I will discuss these differences from a theoretical perspective and frame concrete hypotheses.

Three Theories of Social Integration

First assumptions on the relation between social integration and national identification can be drawn from the concept of social distance. Social distance is seen as a subjective measure describing the perceived void toward another person or social group (Ouellette-Kuntz et al., 2010). One example for this distance could be the affiliation to different social classes or, as relevant here, to being a member of the perceived category migrant versus the category native. Within groups, defined by sharing the same differentiator, there is little social distance between the individuals and the members feel a sense of belonging (Hill, 1984). It can be expected that migrants who have social networks similar to that of natives, that is, networks including large shares of natives, perceive a smaller social distance toward natives and the host society and, therefore, exhibit a greater sense of belonging.

The self-categorization theory (Turner et al., 1987), an advancement of the social identity theory (Tajfel and Turner, 1986), supports these assumptions. The theory assumes that individuals assign themselves to groups with whom they

perceive to have similarities while at the same time they try to distance and demarcate themselves from groups with whom they perceive to have less in common (Turner et al., 1987). The knowledge of being a member of a group sharing certain characteristics not only increases the individual's sense of belonging to said group (social distance) but also the individual's identification with it (Turner et al., 1987). Applying this to the cases of migrants and their national identification, this means that increased similarity between a migrant and the native population should lead to an increased awareness of shared group membership and, hence, increased levels of national identification. Specifically, regarding the effect of social integration: With increased similarity of a migrant's social network to social networks observed in natives (everyday contact to natives in various settings), the migrant's national identification is expected to increase as well.

The contact theory further endorses these expectations, specifically with respect to the effect of social integration. The main idea of the contact theory is that interactions between groups or between individuals from different groups are necessary to dissolve group barriers that exist between them (Allport, 1954). The contact helps individuals to see each other as individuals rather than simple members of another, in itself uniform, group (Brewer and Miller, 1984). This process of individualization further leads to more positive attitudes toward the individuals as well as the individuals' groups (Brewer and Miller, 1984). Concerning migrants' national identification, this would indicate that migrants who have contact to natives develop a more positive attitude toward the host society. This might then influence their national identification since, with respect to the social identity theory, a positive attitude is considered a prerequisite for identification with a specific group (Tajfel and Turner, 1986). Considering all presented theories, a positive association between the amount of contact migrants have with natives and their levels of national identification can be expected (H1).

While all three theories indicate that increased contact to natives should lead to a higher sense of belonging as well as a higher level of national identification, further aspects need to be considered in order to evaluate the potential effects of contact in various settings. This is due to the fact that contact alone is not considered to be sufficient to provoke a lasting attitude change (Amir, 1969). To achieve the desired change in attitude and herewith identification, the contact needs to occur under specific conditions (Amir, 1969; Brewer and Miller, 1984). Advantageous characteristics for the contact setting are direct personal contact and the possibility to contest existing stereotypes, a similar social status of all individuals involved in the situation, the presence of egalitarian norms, and a collective goal that creates a cooperative interdependence between the individuals involved (Allport, 1954; Cook, 1978; Brewer and Miller, 1984). Further, the salience of the group membership in the contact situation affects the impact on the individuals attitudes (Hewstone et al., 1986; Brown et al., 1999; Voci and Hewstone, 2003; Kenworthy et al., 2005). Not all contact situations fulfill these requirements, but it can be assumed that contacts to natives that occur in settings which fulfill the requirements have a greater effect on migrants' national identification than contacts occurring in settings in which the requirements are not fulfilled.

One contact setting that can be assumed to fulfill multiple of the mentioned characteristics is contact to natives within the family setting, for example, migrants who are married to a native partner. Within families, direct personal contact on a regular basis is given, and it can be assumed that the possibility to contest stereotypes is given as well. Family members are often named as individuals' closest contacts and as the people with whom individuals discuss important issues (McPherson et al., 2006; Klofstad et al., 2009). Further, a similar social status between partners can be assumed because relationships tend to happen between individuals who are from similar social backgrounds (Kalmijn, 1998; McPherson et al., 2001; Blackwell and Lichter, 2004) and also because within-couple resources are commonly shared to a certain degree (Dew, 2008; Lyngstad et al., 2011). Interdependence is also given—on the one hand due to the shared resources and on the other hand because decisions made by individuals strongly influence the other members of the family (Kelley and Thibaut, 1978). While interdependence and intimate contact can hardly be disputed, the existence of egalitarian norms in contact settings within families is harder to describe. While gender norms and attitudes have changed toward egalitarianism across many Western societies, gender differences in housework and care work are only slowly reducing and, therefore, largely prevail until today (Hook, 2006; Scott, 2006; England, 2010; Altintas and Sullivan, 2017). Whether these differences are present across all contact situation within the family setting is questionable, however.

Similar to contact within the family, contact among friends usually fulfills the criterion of direct contact as well. Further, it probably provides a sphere which allows the contestation of stereotypes since research has shown that discussions among friends include very personal as well as intimate, but also political topics (Aries and Johnson, 1983; Diiorio et al., 1999). There are indications that political discussions taking place in settings that encourage small talk and provide room for general social interactions and bonding are more likely to change participants opinions and to foster an understanding for others (Kligler-Vilenchik, 2021). Additionally, a similar social status between friends is likely, given there is a general tendency toward homophily in friendships networks (Verbrugge, 1977; McPherson et al., 2001; Burgess et al., 2011). The similar status seems to be accompanied by egalitarian norms, friendships tend to be horizontally organized and based on equality (Laursen and Bukowski, 1997; Berenskoetter, 2014), with friendships exhibiting power differences being perceived as of lesser quality (Veniegas and Peplau, 1997). Another argument for egalitarian norms in friendship settings is the possibility for all involved to dissolve the friendship and build new ones if the relationship is perceived to be unequally beneficial. Lastly, a greater collective goal as well as interdependence are difficult to judge in the friendship context, and research on the issue is sparse. It can be

assumed that interdependence is not as great as in the family setting, since friends' decisions potentially have less influence on the lives of other friends than on (close) family members.

Concerning the workplace, a collective goal and a certain level of interdependence can be assumed. Co-workers work on projects together and the success of the project or company depends on the whole workforce and not just the individual worker. Besides that, employees might also depend on fellow co-workers to fulfill their duties and obligations so that one's own responsibilities can be fulfilled. However, even though there is interdependence and contact at the workplace tends to be personal contact, it is questionable whether the possibility to challenge stereotypes exists. When asked about the individuals with whom one discusses matters that are important, people rarely named their co-workers (Klofstad et al., 2009). Likewise, the presence of a similar social status is debatable since workplace environments are often based on hierarchical structures and power asymmetries. This might also impact the existence of egalitarian norms. Their existence is further questioned with respect to migrants in the workforce given that workplace racism and discrimination are common phenomena (Deitch et al., 2003; Rospenda et al., 2009; Kahanec et al., 2012; Rosette et al., 2018).

Overall, it appears that most of the conditions would be fulfilled within the family setting. Similarly, contact to friends is likely to occur under conditions advantageous for positive attitude and identification change. The workplace environment, on the other hand, seems to fulfill only some of the conditions mentioned above. This leads to the following hypotheses:

The association between having native family members and national identification is stronger than the link between having native friends and national identification (H2).

The association between having native family members and national identification is stronger than the link between working together with natives and national identification (H3).

The association between having native friends and national identification is stronger than the link between working together with natives and national identification (H4).

MATERIALS AND METHODS

Dataset

The analyses presented in this article use data from the IAB-SOEP Migration Sample collected in 2013 (Brücker et al., 2014). The dataset stems from a collaboration between the IAB (Institute for Employment Research) in Nuremberg and the SOEP at the German Institute for Economic Research in Berlin. It includes migrants who immigrated to Germany after 1994 as well as individuals with a migration background who were born in Germany as anchors. Additionally, interviews were conducted with the anchors' household members who were over the age of 16. In total, the dataset includes 4,964 respondents, mostly first- and second-generation migrants. Since it was not possible to differentiate later migrant generations from respondents without a migration background, both groups had to be excluded from the analyses. Further, students, those who were completing an apprenticeship trainee or a voluntary social year and those who were unemployed (including most retirees) as well as part-time retirees working zero hours were excluded from the analyses. For most of these excluded individuals, no information on the contact to natives within the workplace environment was available[2]. **Appendix A1** provides detailed information on the number of respondents excluded from the final sample for each of the above-described categories. The final sample included in the analyses is N = 2,780.

Respondents from the 2013 IAB-SOEP Migration Sample were invited to become members of the SOEP panel in the following year (Liebig et al., 2019). While later waves of the SOEP do not include large numbers of migration-specific variables, aspects of national identification are regularly included in the questionnaire. I merged the 2014 wave of the SOEP to the generated dataset, and 1,943 participants could be matched. Generally, many respondents from the IAB-SOEP Migration Sample chose not to participate in later waves of the SOEP.

Variables

At both time points, the dependent variable *national identification* was measured by the item "To what degree do you think of yourself as German?" with response categories ranging from 1 (completely) to 5 (not at all). The variable was recoded, so that higher values indicate greater national identification. In the following sections, *national identification 2013* refers to the data collected with the IAB-SOEP Migration Sample in 2013 and *national identification 2014* refers to the information gathered from those individuals who also participated in the 2014 wave of the SOEP. Besides national identification, information for all other variables was taken from the IAB-SOEP Migration Sample (2013).

Contact to natives within the family setting was operationalized as having a *native family* member, that is, a household member who is not a first- or second-generation migrant. Respondents who had a native family member were assigned the value 1, and respondents who had no native household members or only household members with a migration background were assigned the value 0.

Contact to natives within the friendship setting was measured by the variable *mostly native friends*. Respondents were assigned the value 1 if about one-quarter, less than one-quarter, or none of their friends were foreigners, and they were coded 0 if about half, most, or all of their friends were foreigners.

A similar operationalization was used for contact to natives in the workplace setting (*mostly native work*). Respondents were assigned the value 1 if about one-quarter, less than one-quarter or

[2]With 1,109 individuals, the unemployed respondents with a migration background represent a group of significant size. As a robustness check I ran additional models including these respondents and only the relations between national identification and the two social spheres for which information was available for this group (family and friends). Overall, the coefficients were similar in direction, size, and significance. Further, the comparison between the coefficients yielded the same results as the overall analyses below. More information can be found in **Supplementary Appendix S1**.

none of the staff at their workplace were foreigners, and they were coded 0 if about half, most, or all of their fellow staff members were foreigners.[3]

As control variables I included various aspects, including sociodemographic as well as migration specific characteristics. Besides *age*, calculated by subtracting the respondents birth year from the time point of data collection, and gender (*male* = 1, female = 0), level of education was included into the analyses. Because no information on the years of schooling was available for most migrants, two dummy variables using the available ISCED-2011 (International Standard Classification of Education) coding scheme were created. *Secondary education* was designated as 1 for respondents whose highest degree came from an institution of secondary education and 0 for everyone else. *Higher education* was designated as 1 for respondents who reported having an educational qualification that exceeded the secondary level and 0 for everyone else. Participants who only received a primary education formed the reference category. In addition to aspects of education, I also considered aspects of the employment situation by including variables controlling for *part-time* (1 if part-time employee, 0 otherwise) and *marginal employment* (1 if marginally employed, 0 otherwise). The reference category was comprised of individuals working full-time.

Concerning the migrant-specific variables, I included *language skills* as an index of the reversed self-reported writing, reading, and speaking skills (each 0–5). The overall scale varied between 0 and 15, with higher values indicating a better understanding of the German language. In addition, I included *second-generation*, a variable indicating whether a respondent was a first- or second-generation migrant (1 if respondent was born in Germany, 0 if respondent was born abroad), *German citizenship* (1 if respondent had the German citizenship, 0 otherwise) as well as the migrants' region of origin. The latter was operationalized as dummy variables following an allocation scheme by Seibert (2011), which first considers the respondents' citizenship, prior citizenship, second citizenship (where applicable), and if necessary the parent's citizenship. If this information did not support the regional allocation, the respondent's and his or her parent's birthplace were used. The following regions of origin were differentiated: *Turkey*, member states of the Commonwealth of Independent States (*CIS*), countries from the *Arab League*, and *Other origins*. Migrants from the European Union (EU) built the reference category. Details on the specific countries belonging to each category can be found in **Supplementary Appendix S2**.

Methods

To test the hypotheses, I ran ordered logit regressions. As a starting point I used cross-sectional models only including information from the IAB-SOEP Migration Sample. Model 1.1 uses *national identification 2013* as the dependent variable and only includes the three contact variables as independent variables. Model 1.2 also includes the general control variables, and Model 1.3 includes all three contact variables as well as general and migrant-specific control variables. For better comparisons between the three models, all three used the same sample, meaning that only those respondents for whom information on all variables was available (those included in Model 1.3) contributed. Also, to increase comparability between the three contact variables, they were standardized in all models.

In a second step, I ran the same regressions now using *national identification 2014* as the dependent variable. All other variables (contact and control) stem from the IAB-SOEP Migration Sample from 2013. Again, I ran three models following the above-described scheme (Model 2: Model 2.1, Model 2.2, and Model 2.3) also using the standardized contact variables and the sample retrieved from the model including all variables as discussed above. However, as indicated earlier, the available sample for regressions including information from the SOEP 2014 wave is much smaller than the original IAB-SOEP Migration Sample, therefore, the sample sizes vary strongly between Model 1 and Model 2. To address these differences and increase comparability, I reran the former regressions with the sample used for the latter, following the same variable scheme (Model 3: Model 3.1, Model 3.2, Model 3.3). Model 3, therefore, includes the same sample as Model 2 which allows comparisons between the cross-sectional model and the lagged model.[4]

I used Wald-Chi-tests to compare the associations of national identification and the three standardized contact variables with each other. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used to assess the overall fit of the models.

RESULTS

Of the 2,780 respondents from the IAB-SOEP subsample, 53% were male. The average age was almost 39 years, and the majority of respondents had completed secondary education (55%) and worked full-time (67%). With a mean of 12.2, the overall language skills were quite high. Overall, only 17% of respondents were second-generation immigrants, and almost half were German citizens (46%). Concerning origin, the largest group was composed by respondents originating from a member state of the European Union (39%) followed by respondents originating from member states of the Commonwealth of Independent States (28%). More detailed information on the sample can be found in **Supplementary Appendix S4**.

With regard to feeling German, 10% reported not feeling German at all, 12% reported feeling barely German, 31% felt

[3]Different operationalizations were applied in robustness checks. Concerning the results, coding those who reported "about half" their friends/co-workers to be foreigners as 1, rather than 0, did not lead to substantial differences in the overall conclusion. Similarly, assuming an underlying interval scale and using the full information provided by the original measure led to coefficients comparable to those reported below. Further information on the robustness checks can be found in **Supplementary Appendix S1**.

[4]Additionally, as a robustness check, I ran separate models for the three spheres. These models indicate the main relation between each kind of contact and national identification. **Supplementary Appendix S3** shows the results for the three lagged models with control variables.

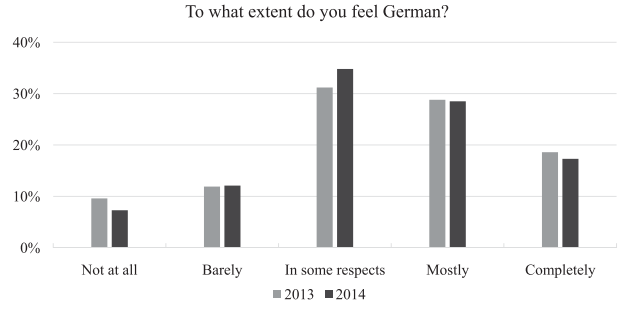

FIGURE 1 | National identification in the years 2013 and 2014.

German in some respects, 29% felt mostly German, and 19% felt completely German. As indicated by **Figure 1**, a similar distribution was found for the 2014 version of this variable. The most notable differences can be seen in the decreased percentages of respondents who indicated "not at all" and the increase in the "in some respects" category.

The three contact variables vary strongly in their distribution. While only 9% of respondents lived with a native family member, 28% reported that less than half of their friends are foreigners, and 51% of respondents reported that less than half of their co-workers are foreigners.

The starting point for the discussion of the link between national identification and the three contact variables is a multivariate cross-sectional analysis using all available cases. As discussed above, three models were run: a model without control variables, a model with general control variables, and a model including both general and migrant-specific control variables. The results, summarized in **Table 1**, indicate that the model including both general and migrant-specific control variables exhibited the best fit according to both the AIC and BIC. This was not only the case in the cross-sectional model with the larger sample, but across the three overall approaches (Model 1, Model 2, and Model 3). Therefore, in the following discussion of the results, I will focus on these models and only include information on the other models when noteworthy changes were observed following the inclusion of the control variables. Detailed information on all models can be retrieved from the respective tables.

Regarding the link between contact and national identification, not all of the three contact variables had the expected positive and significant association. The link between having native family members and national identification was negative across all three models, however it was very small and statistically insignificant. This finding indicates that having native family members is, unlike expected, not associated with individual's level of national identification. The association between having mostly native friends and national identification on the other hand was as expected, with respondents who have higher shares of native friends being more likely to report high levels of national identification. This relation was independent of the inclusion of control variables. The association with working in a predominantly native work setting, however, strongly depended on the inclusion of the migrant-specific control variables. When migrant-specific aspects were not controlled for, the association was positive, substantial, and statistically significant; upon the inclusion of these variables, the association was no longer significant and became quite small.

The comparison of the associations revealed that the association between national identification and having mostly native friends was significantly stronger than the relations between national identification and having native family members or large shares of native co-workers. The latter two associations, both statistically insignificant, did not differ in strength upon the inclusion of the migrant-specific control variables. Prior to the inclusion, having predominantly native co-workers appeared to be more strongly linked to national identification than having native family members.

As expected, most of the control variables—general and migrant-specific—had a statistically significant association with national identification. While the coefficient for age was positive and significant, it was quite small. The variables covering education and employment situation on the other hand all had strong negative associations with national identification. Concerning the migrant-specific variables, increased language skills, and being a second-generation migrant, as well as having the German citizenship were associated with higher levels of national identification. Out of the five regions of origin, respondents coded as originating from a CIS member state or a region belonging to the category "other origin" were more likely to report high levels of national identification than those originating from an EU member state.

The results obtained from Model 3, the models using the sample from the lagged analyses but the cross-sectional approach, were very close to the results from Model 1. The main associations, the directions, sizes of the coefficients, and significances only changed slightly between the models. Similarly, the conclusions about the overall fit were practically unchanged. Concerning the differences in the strength of the associations, the general results from Model 1 hold, with the exception that prior to the inclusion of migrant-specific control variables there was no statistically significant difference in the strength of the associations of having mostly native friends and having mostly native co-workers with national identification. Further, for some of the control variables noteworthy changes concerning the size and significance of the association with national identification were observed. While in the full model with the larger sample (Model 1.3) secondary education, part-time employment and being of Turkish origin were all negatively associated with national identification, this significant link could no longer be found in the smaller sample. Overall, the associations between national identification and the control variables appeared to be smaller in Model 3. However, because of the overall similarities, the results obtained from Model 3 will not be discussed further. Details on the models and results can be found in **Appendix A2**.

Like the change towards the smaller sample, changing the analyses strategy to the lagged variable approach (Model 2) yielded few changes in the results. In comparison to Model 3,

TABLE 1 | Cross-sectional ordered logit models.

	Model 1.1	Model 1.2	Model 1.3
Std native family	−0.05	−0.05	−0.05
	(−1.15)	(−1.23)	(−1.10)
Std mostly native friends	0.33***	0.34***	0.28***
	(8.43)	(8.45)	(6.79)
Std mostly native work	0.12**	0.15***	0.03
	(3.13)	(3.86)	(0.87)
Age	—	−0.01**	0.02***
	—	(−2.65)	(4.01)
Male	—	−0.25**	−0.11
	—	(−2.96)	(−1.23)
Secondary education	—	−0.08	−0.44*
	—	(−0.42)	(−2.36)
Higher education	—	−0.52**	−1.03***
	—	(−2.78)	(−5.30)
Marginal employment	—	−0.79***	−0.59***
	—	(−6.29)	(−4.69)
Part-time employment	—	−0.26*	−0.22*
	—	(−2.49)	(−2.03)
Language skills	—	—	0.18***
	—	—	(9.99)
Second generation	—	—	0.55***
	—	—	(4.92)
German citizenship	—	—	1.04***
	—	—	(11.76)
Turkey	—	—	−0.23*
	—	—	(−1.98)
CIS	—	—	0.52***
	—	—	(4.38)
Arab League	—	—	0.00
	—	—	(−0.02)
Other origin	—	—	0.43***
	—	—	(4.16)
Number of observations	2,402	2,402	2,402
Log likelihood	−3,578.93	−3,541.95	−3,292.33
AIC	7,171.87	7,109.89	6,624.67
BIC	7,212.36	7,185.08	6,740.35
Chi^2 value: native family and mostly native friends	40.15***	41.56***	28.07***
Chi^2 value: native family and mostly native work	7.94**	11.52***	1.86
Chi^2 value: mostly native friends and mostly native work	13.00***	9.63**	15.83***

*Notes: Std in the variable name indicates that the variable was standardized prior to the analyses, z statistics in parentheses, *p < 0.05, **p < 0.01, ***p < 0.001.*

the association between having native family members and national identification was positive, however it was still very small and stayed statistically insignificant (Model 2, **Table 2**). This was found independent of the inclusion of various control variables. Concerning the association between national identification and having a larger share of native friends, no substantial change was observed. The coefficients had the same size (in fact they were identical to the cross-sectional Model 1), meaning the relation was substantial. Respondents reporting lower shares of foreign friends in 2013 were significantly more likely to report high levels of national identification in 2014. Lastly, working in a predominantly native work setting once again had no significant association with national identification when migrant-specific control variables were included. Across the three models (Model 2.1, Model 2.2, and Model 2.3) the associations appeared to be very similar in size and significance to their equivalences in the cross-sectional models (Model 3.1, Model 3.2, and Model 3.3 in **Appendix A2**).

The comparison of the associations again drew a very clear picture in favor of the contact situation including native friends. The association between having predominately native friends and national identification was significantly larger than the respective associations regarding having native family members and having larger shares of native co-workers. The difference between the latter two was again insignificant upon the inclusion of the migrant-specific control variables. Prior to the inclusion, working in a predominantly native work setting appeared to be more strongly linked to national identification than having native family members.

The associations between the general and migrant-specific control variables and national identification mostly stayed the same upon applying the lagged approach. The only noteworthy change was that while coming from a CIS member state was

TABLE 2 | Lagged ordered logit models.

	Model 2.1	Model 2.2	Model 2.3
Std native family	0.02	0.02	0.01
	(0.42)	(0.41)	(0.28)
Std mostly native friends	0.33***	0.34***	0.28***
	(7.01)	(7.14)	(5.76)
Std mostly native work	0.16***	0.19***	0.07
	(3.57)	(4.03)	(1.51)
Age	—	−0.01	0.02**
	—	(−1.59)	(3.13)
Male	—	−0.15	−0.02
	—	(−1.52)	(−0.17)
Secondary education	—	−0.10	−0.47
	—	(−0.44)	(−1.93)
Higher education	—	−0.50*	−1.01***
	—	(−2.13)	(−4.04)
Marginal employment	—	−0.87***	−0.51***
	—	(−5.88)	(−3.40)
Part-time employment	—	−0.07	0.05
	—	(−0.60)	(0.40)
Language skills	—	—	0.16***
	—	—	(7.37)
Second generation	—	—	0.31*
	—	—	(2.28)
German citizenship	—	—	1.23***
	—	—	(11.56)
Turkey	—	—	−0.27
	—	—	(−1.85)
CIS	—	—	0.14
	—	—	(1.03)
Arab League	—	—	0.21
	—	—	(0.98)
Other origin	—	—	0.39**
	—	—	(3.15)
Number of observations	1,675	1,675	1,675
Log likelihood	−2,437.80	−2,412.48	−2,258.29
AIC	4,889.59	4,850.96	4,556.58
BIC	4,927.56	4,921.47	4,665.05
Chi^2 value: native family and mostly native friends	19.51***	20.49***	14.02***
Chi^2 value: native family and mostly native work	4.31*	5.29*	0.68
Chi^2 value: mostly native friends and mostly native work	5.65*	4.48*	8.18**

*Notes: Std in the variable name indicates that the variable was standardized prior to the analyses, z statistics in parentheses, *p < 0.05, **p < 0.01, ***p < 0.001.*

significantly and substantially linked to national identification in the reduced cross-sectional model (Model 3.3.), this link could no longer be found in the lagged model (Model 2.3). For all other control variables, the significance structure stayed generally the same, with only small changes in the strength of the associations.

DISCUSSION

While previous research discussed the relevance of contact to natives for migrants' national identification and tested this assumption in specific settings, little is known about the differences in effects of various kinds of contact. It is therefore unclear which kinds of contact are most strongly linked to national identification. Or assuming causality, which kinds of contact are most influential for migrants' national identification. I gathered first indications concerning this relation by looking at the existing studies that have examined the link between national identification and various contact settings individually and by discussing the results of studies that included multiple contact settings as control variables.

Aspects of the concept of social distance in combination with the self-categorization theory, the social identity theory, and the contact theory suggested that, in general, migrants' national identification should be positively associated with the amount of contact they have to natives (H1). However, extensions of the contact theory suggest that for attitudinal changes to occur, the contact situation needs to meet specific requirements (Amir, 1969; Cook, 1978; Brewer and Miller, 1984). I argued that these requirements were more likely to be met in certain contact situations. Specifically, I discussed three kinds of contacts: contact within the family setting, contact with friends, and contact within the workplace. For each of these settings, the fulfillment of the requirements was discussed. Overall, theoretical considerations suggested that

the requirements for attitudinal change were most often met within the family setting followed by migrants' contact with friends. In contrast, for work-related contacts, the number of requirements met was presumably lower. Therefore, I expected the association between having native family members and national identification to be greater than the association between having native friends (H2) or native coworkers (H3) and national identification. Similarly, having native friends was expected to be more strongly linked to national identification than having native coworkers (H4).

Contrary to expectations, the results indicated that the link between national identification and contact to natives was not generally positive. Rather, the existence of the association was highly dependent on the specific contact situation. Therefore, H1 could not be corroborated.

Concerning the link between having native family members and national identification, neither the cross-sectional models nor the lagged models' results supported the generally expected positive association. Migrants with native family members were not more likely to report high levels of national identification than migrants without native family members. Therefore, it seems as if there is no link between having native family members and national identification. Unlike the family aspect, having mostly native friends was positively associated with national identification in all models, that is, cross-sectional and lagged. Further, this association was significantly larger than the insignificant association between having native family members and national identification. Therefore, H2 had to be rejected. H4, in contrast, could be corroborated since the association between having predominantly native coworkers and national identification was significantly smaller than the association between having predominantly native friends and national identification. However, it should be mentioned that the link between having a larger share of native co-workers and national identification was insignificant in both the full cross-sectional and the full lagged model. Upon closer inspection, it became clear that the link between the two variables depended highly on the inclusion of the control variable related to the respondents' language skills. Lastly, H3 suggested that the association with having native family members would be larger than the association with working in a predominantly native work setting. Contrary to the expectations, the associations, both being insignificant, did not differ significantly from each other in the full model. In the models without the migrant-specific control variables the associations differed significantly, however, the association between working with larger shares of native co-workers and national identification consequently appeared to be larger.

Drawing from these results, it can be concluded that contact to native friends is the most relevant form of contact to natives with regard to migrants' national identification. Programs aiming to increase national identification or, more generally, emotional integration among migrants should therefore focus on settings in which friendships between migrant and native participants can be formed.

This study, however, is not without limitations. One issue concerns the measure for national identification. The concept was measured by a single question: "To what degree do you think of yourself as German?". No further indicators for national identification were available in the data set. Therefore, no indices covering multiple aspects of national identification or similar approaches could be applied and the possibilities to validate the instrument were severely restricted. Future research should aim towards creating a measure which includes multiple aspects of national identification and apply this measure in the replication of studies analyzing the relation between aspect of social integration and national identification.

Besides that, the variable measuring the contact to natives within the family setting should be discussed. The sample is very unbalanced regarding the family setting, less than 10% of the sample were coded as living with a native family member. Since the family setting variable was constructed from information on the migration status of migrants' participating family members, it is possible that migrants who were coded as living without a native family member actually had native family members who simply chose not to participate in the study. An equal participation rate across non-migrant and migrant family members needs to be assumed for a valid interpretation of the results. However, there is no information backing the assumption.

Further, while lagged models were used, no full longitudinal analyses were possible since the contact and migrant-specific variables were only collected in the IAB-SOEP Migration Sample and not in later waves of the SOEP. This also meant that no analyses regarding the reversed causation was possible. It is therefore unclear whether the link between having native friends and national identification is solely based on the effect of contact on national identification or if the migrants' level of national identification might also influence their choice of friends.

In conclusion, there are still a few issues that require further attention, such as the small sample of migrants with native family members and the topic of (reversed) causation. Nonetheless, the presented study provides valuable insights into the field: first, by presenting an overview of the existing literature on the influence of social integration on national identification; second, by offering a theoretical approach linking the two aspects; and finally, by simultaneously analyzing the associations between national identification and contact to natives across multiple settings. Overall, for migrants in Germany, the formation of national identification was strongly linked to their friendships with natives, but not so much to their contact to natives within the family or workplace setting.

DATA AVAILABILITY STATEMENT

Publicly available datasets were analyzed in this study. This data can be found here: https://www.diw.de/en/diw_01.c.678568.en/research_data_center_soep.html.

AUTHOR CONTRIBUTIONS

CCB came up with the idea and conception of the study, performed the statistical analysis and wrote the manuscript. CCB revised and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsoc.2021.700580/full#supplementary-material

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APPENDIX

TABLE A1 | Sample development.

Change	Lost	Left
Original sample		4,964
Dropped: no migration background	309	4,655
Dropped: unemployed	1,609	3,046
Dropped: apprentices	240	2,806
Dropped: students	22	2,784
Dropped: voluntary social year	3	2,781
Dropped: retirees working 0 hours	1	2,780
Sample for cross-sectional analyses		2,780
Merge with SOEP 2014	837	1,943
Sample for lagged analyses		1,943

TABLE A2 | Cross-sectional ordered logit models with sample from lagged models.

	Model 3.1	Model 3.2	Model 3.3
Std native family	−0.06	−0.05	−0.08
	(−1.18)	(−1.14)	(−1.55)
Std mostly native friends	0.31***	0.31***	0.28***
	(6.51)	(6.54)	(5.63)
Std mostly native work	0.17***	0.20***	0.06
	(3.68)	(4.21)	(1.26)
Age		−0.01	0.02***
		(−1.78)	(3.63)
Male		−0.14	0.01
		(−1.39)	(0.06)
Secondary education		−0.02	−0.31
		(−0.07)	(−1.24)
Higher education		−0.46	−0.88***
		(−1.85)	(−3.43)
Marginal employment		−1.01***	−0.65***
		(−6.77)	(−4.35)
Part-time employment		−0.15	−0.08
		(−1.24)	(−0.67)
Language skills			0.18***
			(8.32)
Second generation			0.43**
			(3.17)
German citizenship			0.94***
			(8.94)
Turkey			−0.18
			(−1.22)
CIS			0.45**
			(3.28)
Arab league			−0.19
			(−0.86)
Other origin			0.51***
			(4.17)
Number of observations	1675	1675	1675
Log likelihood	−2484.93	−2452.50	−2305.57
AIC	4983.86	4931.00	4651.15
BIC	5021.82	5001.50	4759.62
Chi^2 value: native family and mostly native friends	27.19***	27.27***	24.22***
Chi^2 value: native family and mostly native work	10.77**	13.40***	3.73
Chi^2 value: mostly native friends and mostly native work	3.93*	2.57	8.63**

*Notes: Std in the variable name indicates that the variable was standardized prior to the analyses, z statistics in parentheses, *p < 0.05, **p < 0.01, ***p < 0.001.*

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The Motherhood Penalty of Immigrants in France: Comparing the Motherhood Wage Penalty of Immigrants From Europe, the Maghreb, and Sub-Sahara With Native-Born French Women

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To date, relatively few studies analyzed the motherhood penalty as experienced by immigrant women. The principal objective of this research is to establish whether the negative effect of motherhood on wages is higher for immigrants than it is for the native population; and how this effect may vary across different immigrant regions of origin. Using data from the Enquête Revenus Fiscaux et Sociaux from 2009 to 2012 (INSEE, 2009–2012)[1], a series of linear regression models were calculated to examine whether the effect of motherhood on wages differs for immigrant women and native women; and to what extent this effect varies across different immigrant origin groups. Specifically, this study explores the effect of motherhood on immigrant labor market integration in France from three regions of origin, as compared to native French women: immigrants from sub-Saharan Africa, the Maghreb (Algeria, Tunisia, and Morocco), and from European countries (each and every region of origin is considered separately in comparison to native French women). The results revealed substantial differences in the motherhood penalty between the different regions of origin and assert the existence of an especially pronounced motherhood penalty for mothers from the Maghreb. Given the gap in the research with regards to the cost of motherhood for immigrants in the labor market of the host country, this research sheds light on specific mechanisms influencing the integration patterns of immigrant women. Moreover, by choosing France, which is one of the main immigration destinations in Europe, and a country where the motherhood penalty for the native population is almost non-existent, this study provides a new perspective on the intersection of motherhood, immigration, and region of origin in the immigrants' labor-market integration process.

Keywords: motherhood penalty, immigration, ethnicity, motherhood ideology, intersectionality, self-selection, family investment hypothesis, immigration in France

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INTRODUCTION

Scholars have identified abundant evidence explaining differences in the integration of immigrants in host countries from various region of origin. Academic literature points out the difficulties, that immigrants face in finding suitable and rewarding employment in the labor market of a variety of host countries (Chiswick, 1978, 1980; Borjas, 1987, 1992, 1995; Gorodzeisky and Semyonov, 2011).

The ethnicity or region of origin of immigrants has been underscored as a one of the factors affecting their integration. As such, immigrant integration into the labor market of the host countries differs across ethnic and gender groups. More specifically, immigrants from less economically developed countries tend to face greater difficulties in finding suitable employment compared to other immigrant groups (e.g., Raijman and Semyonov, 1997; Heilbrunn et al., 2010; Pichler, 2011). Research has further shown that regardless of region of origin, immigrant women experience greater difficulties than immigrant men in the labor market of the host society (Raijman and Semyonov, 1997; Logan and Rivera Drew, 2011; Fleischmann and Höhne, 2013). One aspect that remains relatively unstudied is the specific cost of motherhood for immigrant women compared to their non-immigrant peers in the host country.

Various research suggests that the gender gap between men and childless[2] women in the general population has shrunk with regard to employment and earnings (Budig and England, 2001; England, 2005). However, the gap between women with children and those without children seems to have remained across most Western countries (Budig and England, 2001; England, 2005; Budig et al., 2012, 2016; Halldén et al., 2016; Cukrowska-Torzewska, 2017; Cukrowska-Torzewska and Lovasz, 2020). This gap is known in the literature as the "motherhood penalty." The motherhood penalty and the integration patterns of immigrants have been the subject of numerous studies taken separately, but much less attention has been focused on considering the relationship between them. Consequently, it has not been established whether the negative effect of motherhood on wages would be higher among immigrants than among the native population and whether this effect differ by region of origin[3].

In order to fill this gap in the literature, this study aims to answer the following questions: (1) (a) Does a woman's immigration status and motherhood affect her income, and if so, to what extent? (b) Does the effect of motherhood on income differ for immigrant women compared to native women? (c) Does the effect of motherhood on income differ across origin groups of immigrants[4]?

The case of economic integration of immigrant women coming from three groups of origin is examined: immigrants from sub-Saharan Africa (Senegal, Mali, Cote d'Ivoire, Cameroon); immigrants from the Maghreb (Algeria, Tunisia, and Morocco); and immigrants from several European countries. Each of the three regions of origin will be considered separately in relation to native-born French women[5].

France has a long history of immigration and a considerable immigrant population (12%: OECD/European Union, 2018). The composition of the immigrant population into relatively large groups of immigrants facilitates the identification of specific immigration patterns and cultural differences among these groups. Finally, studies on the motherhood penalty in France have found it to be nearly non-existent there in terms of wages (Budig et al., 2012, 2016), with virtually no penalty for mothers with one or two children—the penalty begins to be manifested only after the third child. The lack of a motherhood penalty in France has led to a paucity of research on the subject exclusively within the French context; the identification of such an effect among France's immigrant population, and especially within specific groups, may lead to a renewed interest encouraging further research on the topic.

The literature on gender has often argued that the intersectional identities of some groups of women generates additional disadvantages in the labor market beyond those incurred by the identity of being a woman alone (Browne and Misra, 2003; Glauber, 2008; Mandel, 2012). In this study, I argue that understanding the significance of the intersection between gender, ethnicity, and motherhood for different groups of women is crucial in order to understand the perpetuation of gender inequality. Moreover, earlier lines of research in France focused largely on the experiences of native women, and subsequently lacked an intersectional approach. Thus, in

[2]The term "childless" will be used in this study for women without children, whether or not by choice.

[3]Some researchers have established differences between married immigrant women and unmarried immigrant women (Duleep and Sanders, 1993; Baker and Benjamin, 1997) or have used children as a control variable when analyzing the disadvantage experienced by women immigrants. But to the best of my knowledge, no research to date has considered the relative labor market cost of motherhood for immigrants compared to natives.

[4]The term origin groups or region of origin will be used interchangeably throughout this study to describe the different regions of origin of immigrant groups.

[5]The data used in this study lacked country-specific detailed variables, given that the country of birth of the respondent was pooled into five regions only: France, Europe, the Maghreb, sub-Saharan Africa, and other. Moreover, France has a large population of immigrants from Turkey and Asia, not taken into account within this analysis as they were all pooled under the "other" category in the country of origin variable. It should be noted that there are large cultural and socio-economic variations across the diverse countries that make up each region of origin. The socio-economic and cultural differences across the various countries in Europe, and especially between post-Socialism Eastern European countries and continental western European countries, are quite pronounced. However, given that the cultural and linguistic characteristics within the different countries of the Maghreb and, to a smaller extent, sub-Saharan Africa, are quite homogeneous, this may be less of an issue for the latter regions. Moreover, by analyzing immigrant women from the Maghreb, sub-Saharan Africa and Europe, this study analyzes the largest groups of immigrants in France's immigrant population; it also succeeds in differentiating between immigrants from poor and less developed countries, immigrants from culturally conservative and mostly Muslim countries, and immigrants from more developed countries.

expecting a divergent effect of motherhood among minorities, this study proposes that the intersectional identities of immigrant mothers can have important outcomes for their success in the labor market.

CHAPTER 1: THEORETICAL BACKGROUND

Gender and Immigration

According to the "classic assimilation model," immigrants can face disadvantages in the first years after immigration due for the most part to limited familiarity with the host country's language, lack of educational and cultural resources, limited social networks and restricted access to information. Due to these limitations, upon arrival in the host society immigrants often accept lower paying jobs that do not match their skills and human capital attributes. Earnings of immigrants are therefore lower than among their native-born counterparts. Nevertheless, with the passage of time, the economic disadvantages of immigrants tend to decline and their advantages even surpass the native-born population in some cases (Chiswick, 1980).

Early studies on the assimilation trajectory of immigrant women argued that in the first years of immigration, women tend to have high levels of employment that decrease with time in the host country (Chiswick, 1980; Long, 1980). Women who immigrate with a partner or a family are assumed to be "tied movers." The term "tied migration" refers to migration resulting from a decision taken by one member of a couple or family to immigrate along with their partner in order to maximize family earning potential, irrespective of individual earning potential (Mincer and Polachek, 1978). Since women are assumed to immigrate due to family imperatives rather than independent economic aspirations, immigrant women work in the host country only to support their partner's career. However, once their partner reaches an improved financial status in the host country, women tend to decrease their economic participation. Therefore, the economic integration course of immigrant women may be less linear compared to that of immigrant men (Mincer and Polachek, 1978; Chiswick, 1980; Long, 1980; Baker and Benjamin, 1997).

Whereas, the incentive of childless women to immigrate is likely to stem from a motivation to better their own individual economic prospects, women with children, by contrast, are more likely to be tied movers. However, since family responsibilities are traditionally held by women, the mere existence of children within a family is the primary family responsibility for both native and immigrant women. Immigrant women often leave behind their network of family and friends that usually aids in the support of family responsibilities. In addition, immigrant women often lack an established professional network. Thus, immigrant women with children may suffer disproportionately lower labor market prospects compared to childless immigrant women and native mothers[6]. Consequently, immigrant women with family responsibilities are likely to face greater hardship in finding suitable employment, resulting in reduced interaction with the local population and therefore fewer opportunities to learn the local culture and language. The integration process will be slower, and employment prospects will thus be reduced (Boyd, 1984; Raijman and Semyonov, 1997; Hondagneu-Sotelo, 2003; Pessar, 2003).

Differences Between Natives and Immigrants: The Motherhood Penalty

Although the economic gap between men and women has decreased in the past three decades, the gap between women with children and those without children has remains a feature in most Western countries (Budig and England, 2001; Avellar and Smock, 2003; Gough and Noonan, 2013; Levanon and Grusky, 2016). The cost of motherhood encompasses multiple elements—not only is there discrimination against mothers by employers (Benard et al., 2007), but career interruption, too, results in the loss of experience and employment tenure (Budig and England, 2001; England et al., 2016; Killewald and García-Manglano, 2016) and fewer opportunities to accumulate human capital (Miller, 2011; Kahn et al., 2014; Williams and Dempsey, 2014; Gough, 2017). Some scholars also argue that motherhood may also lead to lower job performance, resulting from the double shift that these women are burdened with, women consequently choosing mother-friendly segregated jobs, trading wages and occupational prestige for more compatible arrangements (Becker, 1991; Budig and England, 2001).

The disadvantages faced by mothers in terms of income differ considerably by country, class, marital status, ethnicity, country of origin, race, and labor market context (Raijman and Semyonov, 1997; Browne and Misra, 2003; Glauber, 2008; Mandel, 2010; England et al., 2016). The wage penalty for mothers ranges from 0 to 1% in Israel and Belgium (Davies and Pierre, 2005; Budig et al., 2012) to as much as 18% per child in the Netherlands or West Germany (Budig et al., 2012, 2016) even after controlling for background variables and selection.

Although all mothers—immigrant and native alike—may suffer from the negative effect of motherhood on wages, immigrant mothers are likely to suffer further costs due to their immigration status. First, immigrants may have difficulties in the first years after immigration due to limited knowledge of the language in the host country and its local culture

[6]The data is not sufficient to allow for an examination the effect of primary worker status on labor market integration. Instead, I assume that married women, and especially those with children, are the "tied-mover" by default (Raghuram, 2004). Since 1974, immigration to France is permitted only on a family reunification basis (except for immigrants from within the "Schengen" borders). It is thus logical to assume that immigrant women immigrating to France after 1974 from origin countries outside the EU will be tied movers. I am aware that this is not uniformly true. However, as this is often the case and due to the lack of data enabling the identification of primary movers, a large number of studies within the family investment literature adopt these assumptions (Baker and Benjamin, 1997; Raghuram, 2004; Sorenson and Dahl, 2016).

and norms. Moreover, immigration to a new country typically involves interruption of prior work in the country of origin, which, taken together with the immigration itself incurs loss of established personal or professional connections. These women will need to build an entirely new professional network in the host country, an endeavor for which the presence of children constitutes an added disadvantage to both immigration and motherhood independently.

The combination of these obstacles will negatively affect their professional trajectory in comparison with that of native mothers; when intersected with the general motherhood penalty, it may create an additional disproportionate cost compared to the one paid by immigrant women with no children and native mothers[7].

At this point, we can formulate the following hypotheses on the relationship between immigrant status, motherhood, and economic integration into the host country's labor market:

Hypothesis 1—refers to the labor market outcomes of immigrant mothers in the host country's labor market, compared to immigrant women without children:

(H1a) Immigrant mothers will have lower wages, compared to immigrant women without children.

Hypothesis 2—refers to the labor market outcomes of the immigrant mothers in the host country's labor market, compared to native mothers:

(H2a) Immigrant mothers will have lower wages, compared to native mothers.
(H2b) The negative effect of motherhood on wages of immigrant women will be higher than such an effect on wages of native women.

Differences in Country of Origin in Selection of Immigrant Women

The literature indicates that immigration costs can vary between different geo-cultural immigrant groups. The cost of immigration fluctuates in relation to the immigrant's country of origin and ethnic background, for both men and women (Boyd, 1984; Blau et al., 2011; Khoudja and Fleischmann, 2015; Ala-Mantila and Fleischmann, 2018). When immigrating to a developed country, immigrants from poor, less developed countries face more hurdles than immigrants from developed countries, resulting in a higher loss of actualization of their human capital (Friedberg, 2000; Reitz, 2001; Rumbaut and Portes, 2001).

Immigration may offer better chances for some women than those available in their country of origin; when emigrating, however, women from less developed countries of origin may face more disadvantages than women emigrating from more developed ones (Boyd, 1984; Raijman and Semyonov, 1997; Antecol, 2000; Blau et al., 2011; Gorodzeisky and Semyonov, 2011; Ala-Mantila and Fleischmann, 2018). However, women from different regions of origin may be positively or negatively selected according to their motivation for immigration.

As such, according to the family investment model (Baker and Benjamin, 1997), women who are tied movers from more economically developed countries will be more likely to have partners who are positively selected in the host country's labor market[8]. It is thus less probable that these women will be in a position in which their economic input is vital for the family's survival, and therefore will be employed at a lower rate. However, when employed, it may be by choice and thus more likely to be at higher wages and occupational status. On the other hand, women with children from poor, less developed countries may have a high rate of employment. However, since they are likely to be working in order to compensate for their partner's insufficient earnings and to ensure family survival, they may be obliged to accept whatever job is available to them, possibly at lower wages and occupational status.

Cultural differences, gender norms and motherhood ideology can vary across countries of origin and geo-cultural backgrounds (Inglehart and Norris, 2003; Idema and Phalet, 2007; Diehl et al., 2009). Studies in the United States, for example, have shown that the motherhood penalty was lower for Afro-American women (Gough and Noonan, 2013). Afro-American women may be in extreme need of employment due to their precarious economic conditions and their relatively low marriage rates, but also because of low earnings and work instability of racial minority men (Glauber, 2008, 2018; Gough and Noonan, 2013). Moreover, African culture has always encouraged mothers to be responsible for the economic wellbeing of their children and family. These work and motherhood practices are grounded in the historical, economic, and cultural traditions of African women (Branch, 2011; Dow, 2016).

In contrast, strong religious commitment, especially Islam, has been presented as one of the main factors contributing to the cultural preservation of traditional gender-role behaviors, and individuals with strong religious commitment levels are less likely than their secular counterparts to hold egalitarian gender-role attitudes (Idema and Phalet, 2007; Diehl et al., 2009). A large number of studies have found that Muslim immigrants face the largest disadvantages, even when compared to other migrants or immigrants from the same countries of origin that are not Muslim (Silberman et al., 2007; Khattab and Modood, 2015). In addition, Muslim women (immigrant or native) have lower levels of employment than women from other religious groups, even after controlling for human capital and family status characteristics. This is true in the United Kingdom (Connor and Koenig, 2015; Abdelhadi and England, 2019), Germany (Diehl

[7]While a strong negative motherhood effect is likely to occur for first-generation immigrant women, this might be not the case for second-generation immigrant women. Second-generation immigrant women are presumed to be proficient in French and be more familiar with French culture compared to the first-generation. They are also more likely to have a family network that can help with childcare and to have developed peer or professional network, which can influence their employment outcomes. Therefore, motherhood is prone to affect second-generation immigrant mothers in a different manner than how it affects first-generation immigrant mothers.

[8]Immigrant mothers from more developed countries can be less inclined to be in employment if they emigrate with a potentially high earning partner and women emigrating from less developed countries may be more inclined to be employed, as the potentially low income of their partner forces them to compensate for his insufficient earnings. Unfortunately, the data provide no information on the partner employment patterns or income, there they effect on labor market outcomes of immigrant women cannot be examined.

et al., 2009), the Netherlands (Khoudja and Fleischmann, 2015), Canada (Reitz et al., 2015), India (Klasen and Pieters, 2015), and Malaysia (Amin and Alam, 2008).

Due to low labor force participation rates of women and traditional gender-role attitudes in traditional countries of origin, women from these countries may have greater difficulties entering the labor market of the host country. Yet, the barriers that they have to overcome to be active in the host country's labor market may cause them, as a result, to be a positively selected group with high human capital, with higher labor market outcomes than women who did not have to face such obstacles (Borjas, 1987, 1992; Stier and Tienda, 1992; Reitz, 2001). Thus, a positive selection of women from traditional countries of origin into the host country's labor market can occur. On the other hand, immigrant mothers belonging to groups with modest resources and with low levels of cultural and religious similarity to the host country may face a higher level of discrimination and tend to experience a greater motherhood penalty compared to mothers who immigrated from countries of origin with a high level of cultural similarity[9].

Host Country Characteristics—The Context of France

Research studies have repeatedly demonstrated that the motherhood penalty in France is nearly non-existent (Budig et al., 2012, 2016). The wage penalty for one or two children does not exist at all, with the penalty beginning manifestation only after the third child, depending on the estimation method (Davies and Pierre, 2005). The relatively low motherhood penalty in France is typically explained by family-friendly policies such as free daycare facilities open all day long, and accommodating for children as young as 3 months old (Cukrowska-Torzewska, 2017; Lucifora et al., 2017). Moreover, the combination of paid work and family is socially accepted in France.

France is a country with a long history of immigration (Noiriel, 1988; Algan et al., 2012; Pailhé, 2015). In the years following World War II, France adopted an organized and controlled immigration policy. This rather exclusionary immigration policy accepted immigration primarily from former French colonies, Turkey, and European countries. Immigrants, mostly men, came to France from Turkey, Spain, Portugal, Morocco, and Algeria. After 1974, the government limited immigration to family reunification alone, and to specific work permits stemming from employer requests (Perrin-Haynes, 2008). Later, the formation of the European Union (EU) in 1993, establishing a single market accompanied by the free flow of labor, and further EU expansion in 2004, led to a massive migration movement within EU borders.

The majority of immigrants from former French colonies have a good command of the French language since it was the official language for all French colonies. Despite this linguistic advantage, the majority of France's immigrant populations are manual workers who suffer from poor employment conditions (Constant and Zimmermann, 2005).

Different immigrant origin groups in France experience divergent paces of integration. Studies in France comparing Portuguese, Asian and Turkish immigrant communities with the North African immigrant communities have shown that while the first three groups are less assimilated culturally, they also experience less racism and are more dynamic economically than the North African community (Dubet, 1989; Alba and Foner, 2016). The public debate on immigration focuses almost exclusively on Islam, a religion perceived by mainstream French society as a threat to basic laic values (Silberman et al., 2007; Thomson and Crul, 2007; Foner and Alba, 2008; Koopmans, 2016). As such, religion in France is considered a factor delaying integration and the French native population has come to associate Islam with problematic integration; anti-immigration sentiments are becoming more pronounced and have taken the form of an essentialization of religion and anti-immigration sentiment (Foner and Alba, 2008; Blommaert et al., 2014).

We can assume that the magnitude of the impact of motherhood on immigrant integration in France differs by region of origin, as the regions are characterized for the most part by different levels of economic development, gender ideology, levels of traditionalism with respect to gender norms and cultural and religious similarity to the native population. Women immigrating from European countries are likely to have better labor market outcomes than immigrant from Maghreb and sub-Saharan Africa, due to a number of reasons. First, European countries share overall similar income distribution patterns with France (Frikey et al., 2004; Silberman et al., 2007; Perrin-Haynes, 2008). Immigrants from European countries are likely to share similar cultural values and religious backgrounds with French society, including beliefs regarding gender-role attitudes. As a result, they are likely to face relatively less discrimination from French employers compared to other immigrant groups. Immigrant mothers from Europe, however, may conceivably be in less immediate need of additional income when immigrating with a partner who possesses high human capital transferability. Yet due to the high selectivity of these women into the French labor market, when employed, they may have higher income compared to immigrant mothers from the Maghreb and sub-Saharan Africa.

Immigrant women from the Maghreb are likely to bear the highest penalty of all groups, regardless of motherhood status, due to high inequality in income distribution in their countries of origin and the fact that their cultural values may be very different from French natives. Gender-role norms and attitudes of women from the Maghreb are likely to be very different from those of natives, especially since they come primarily from highly traditional and religious Muslim countries (Diehl et al., 2009; Röder and Mühlau, 2014). Immigrant women from the Maghreb, therefore, can be expected to be a disadvantaged group, especially when they have children. When employed, however, it

[9]I was not able to empirically differentiate the effect of the country of origin's level of development from the effect of the country of origin's level of traditionalism or ideology concerning gender role. However, it is important to address these two approaches, as they are likely to impact the labor market outcomes of immigrants in a different manner. Empirically, these two approaches should be considered competing hypotheses.

is unclear whether these women will have low income compared to immigrant mothers from sub-Saharan Africa, European countries, and native mothers, or, on the contrary, high income as a result of the possible high selection of these women into the French labor market.

Due to the low level of development in their countries of origin, immigrants from the sub-Sahara may experience the low transferability of their human capital, and thus be obliged to accept occupations that do not match their qualifications. As a result, we may observe lower income for women from sub-Saharan Africa, who may prefer to work under lower conditions that nevertheless subsidize occupational adequacy with essential income generation.

At this point, we can formulate the following hypotheses about the interaction between country of origin and the labor market outcome of mothers in France:

Hypothesis 3—refers to the economic outcome of immigrant mothers by region of origin, compared to native mothers in the French labor market.

(H3a) The wages of an immigrant mother from Europe in the French labor market are higher than the wages of an immigrant mother from the Maghreb or from sub-Saharan Africa.

A positive selection of immigrant women from traditional and conservative regions of origin[10] may arise in the French labor market, and thus:

(H3b) The income of an immigrant mother from the Maghreb in the French labor market are higher than the income of an immigrant mother from European countries or from sub-Saharan Africa, due to the high selectivity of these women into the French labor market.

CHAPTER 2: DATA VARIABLES AND METHODS

Data and Variables

The Data was taken from the French "Enquête des Revenus Fiscaux et Sociaux (ERFS)," 2009–2012 (ERFS, INSEE, 2009, 2010, 2011, 2012), the French labor force census, providing information on more than 600 variables at the individual and household level. In order to analyze a sample including a sufficient number of cases, I pooled 4 years of data (2009-2012). The pooled sample included information on 66,539 native women and 10,983 foreign-born women (first-generation immigrants) between 18 and 50 years old.

The dataset includes information on gender, age, marital status as well as cohabitation, the number of children at home under 18 years, the number of children at home under 6 years, education, occupation, employment status, income, weekly working hours, country of birth[11] and years since immigration[12].

Variables

This study focuses on income as the dependent variable. The income level is calculated as the logarithmic transformation of annual wages. Only women working more than 5 h a week and earning between €10 and €100,000 annually have been included, conditions that represent 99% of the working population. I noticed that most self-employed women do not take a salary and 80% of them reported a €0 annual income; I chose to omit them from the models.

The main independent variables relate to motherhood and immigration status[13].

The literature suggests that the presence of young children is specifically related to the motherhood penalty since young children require more care and cannot be left alone during working hours (Anderson et al., 2003). On the other hand, the literature also indicates that the motherhood penalty has lifetime consequences on women's employment and the effect of motherhood can be identified long after children have passed the early childhood stage (Budig and England, 2001; Benard et al., 2007). Although the literature provides sufficient evidence on the effect of both the age and number of children on the motherhood penalty, the small variance in the number of children among women in France created multicollinearity, with inconsistent and insignificant results. Moreover, although France provides extended family policies such as free daycare facilities for children from a very young age, gender norms of certain immigrant groups can shape attitudes associated with childcare, thus mothers may be expected to provide primary care for their young children despite those policies. Older children may not require such an extended level of care because older children can provide for their own needs more easily and have more agency. I decided therefore to take the age of children into account instead of the number of children[14]. Nevertheless,

[10]Traditional countries' refers to countries with traditional gender role norms, where women's labor participation rates are low, primarily Muslim countries.

[11]In 2010, 2011, 2012 the dataset included 5 values for the variable country of birth: 1. France, 2. Maghreb, 3. Sub-Sahara Africa, 4. Europe, 5. Other countries.

[12]I am not able to control for years since immigration for the immigrant population, since the models of both the native population and the immigrant population need to be analyzed in an identical manner to allow comparison of the interaction between immigration status and motherhood status. Thus, assuming that the variable years since immigration were to be added in the model of the immigrant population, the juxtaposition would become impossible.

[13]I am aware that there might be potential selection bias into motherhood. Selection into motherhood might be different across immigrant groups, and some groups of women might tend to have children at higher rates and at younger ages. Work choices of women are strongly influenced by gender norms, which are likely to differ across countries (Blau and Kahn, 2007; Budig et al., 2012, 2016). Unfortunately, I am not able to take into account the selection into motherhood as the variables present in my data are missing detailed information on motherhood such as children ever born to a woman, age at first birth, and hence, do not allow me to predict selection into motherhood. However, the literature has pointed to the importance of education in shaping fertility patterns (Kahn and Whittington, 1996; Cohen and Blanchi, 1999), therefore controlling for years of education and choosing to perform a regression analysis for immigrant and native women, as well as, for each region of origin separately, might potentially moderate the selection bias into motherhood.

[14]A Robustness check testing the effect of having children regardless of their age is presented in **Appendix B**.

since norms can shape gender-role attitudes associated with childcare, I expect the effect of young children to fluctuate across immigrant groups, depending on the origin group to which the women belong[15].

The variable related to motherhood is calculated using two different sets of dummy variables including three categories and indicating whether the respondent has children and referring to the number and age of the children. These are mutually exclusive variables and include the categories: (1) having children between age 0 and 6 years living in the household (the respondent has children aged 6 or under = 1, all the rest = 0), and (2) children between age 7 and 18 years living in the household[16] (the respondent has children between 7 and 18 years old = 1, all the rest = 0), no children = 1, all the rest = 0 (the omitted category)[17].

The immigration status variable will be used as three different sets of categories. The first variable is a dummy variable and will represent the status of immigrant; immigrant = 1; native-born women = 0. The second variable related to immigration will differentiate between main regions of immigrant origin. This variable will be calculated as a series of dummy variables: (1) Immigrants from Sub-Sahara Africa = 1, all the rest = 0. (2) Immigrants from Maghreb = 1, all the rest = 0. (3) Immigrants from European countries = 1, all the rest = 0.

In addition, I will control for the following variables: occupation, education (in years), marital status as a dummy variable indicating whether the respondent is married or not (married = 1, not married = 0), age (in years) and working hours (in hours)[18].

The control variables will be added on the basis of previous studies that have shown their role in labor market integration of mothers and the size of the motherhood penalty. ***Occupational status*** is likely to affect income directly; numerous explanations have been proposed for the relationship between wages and occupational gender segregation. Supply-side explanations argue that women choose specific occupations because of the particular attributes they provide, compensating for the low earnings they offer. The demand-side explanation, by contrast, argues that women are often "pushed" into low-quality jobs due to discrimination and devaluation (Reskin and Roos, 1990; Findlay et al., 2009). Moreover, literature has established that the gender gap in female occupations will be larger than in more neutral occupations since men are in a much stronger position than women. White-collar occupations are expected to be concentrated in the public sector and to be occupied by more educated employees, while blue-collar occupations are more likely to be in the private sector and populated by less educated employees. These differences affect wages, but also affect other dimensions of employment. Thus, occupations are likely to affect wages of mothers, depending on the work conditions they offer. Furthermore, occupation may be correlated with marital status or the country of origin's level of economic development or gender norms. Following Stier and Yaish (2014), four occupational categories are defined: high white-collar (professional, semiprofessional and managerial occupations); low white-collar (clerical and service occupations); high blue-collar (skilled and semi-skilled occupations); and low blue-collar (primarily unskilled occupations).

Educational attainment is closely related to income, where women with lower educational levels tend to have lower employment opportunities, occupational status, and income. Moreover, education may act as a control for selection into motherhood, as literature has demonstrated the relationship between educational level and fertility delays (Amuedo-Dorantes and Kimmel, 2005; Wilde et al., 2010).

Marital status is also found to be a significant variable affecting the motherhood penalty. Married women may have more financial resources, and thus may be able to choose not to work, or to work in part time jobs, because their partner's income may suffice to support the family's needs. On the other hand, the existence of a partner can enable the couple to share family responsibilities and thus it may be easier for married women to look for a rewarding employment (Budig and England, 2001). Single mothers may need to work longer hours in order to support their children, resulting in higher employment rates and higher income among unmarried women. Conversely, we also observe a reverse tendency, where single mothers may be unable to work since they are the sole caregivers of their children. It should be noted, however, that single mothers receive rent allowance and child day care for all is free in France, enhancing their capacity of employment[19].

The ***Age*** of an individual is likely to influence work perspectives in different ways. Prior research has demonstrated that discrimination can be made by employers on an age basis. Older people may face difficulties in finding a job or early retirement layoffs, as employers prefer a younger workforce (Rosen and Jerdee, 1977). In addition, since measures of actual experience were not available in the data, age serves as a proxy of potential experience.

[15]Unfortunately, I have not been able to take into account the selection into motherhood, as the variables present in my data are missing details on motherhood such as children ever born to a woman, age at first birth, which may vary across immigrant groups. However, the literature has pointed to the importance of education in shaping fertility patterns (Tienda and Glass, 1985; Kahn and Whittington, 1996; Cohen and Blanchi, 1999), therefore controlling for years of education and choosing to perform a regression analysis for immigrant and native women, as well as for each region of origin separately, might potentially moderate the selection bias into motherhood.

[16]Children of the women interviewed living in the household.

[17]The information in the data includes the number of children only by three categories of age—under 3 years old, under 6 years old and under 18 years old. Thus, I cannot analyze the number of children and their age separately. I therefore chose to create a variable that includes having children or not by two categories; below age 6 and between 7 and 18. Moreover, taking into account children under 18 years old allows us to portray longer time effects of motherhood on wages.

[18]The square root term of working hours, was analyzed in order to reduce skewness, however the square root term had more skewness than the natural term (see **Appendix A**), therefore, I chose to keep the weekly hours as the control variable.

[19]The variables take into account the marital status and not the cohabitation status since I lack cohabitation data such as relationship length. Moreover, since 1974, immigration to France is permitted only on a family reunification basis (except for immigrants from within the "Schengen" borders). Therefore, controlling for marital status instead of cohabitation seems to be much more relevant for immigrant women.

Wages and salary are directly influenced by ***Working hours*** and women with children may prefer to be employed as part-time rather than full-time workers to reduce work-family conflict (Stier and Lewin-Epstein, 2003).

Finally, the variable "living in sensitive urban area" will be added to the models when performing the Heckman two-step procedure to account for potential selection bias. ***Sensitive urban areas*** are dense urban settlements with low-income households and high unemployment rates. They have become increasingly stigmatized, particularly following the urban riots of 2005 (Lagrange, 2006). Scholars have also demonstrated that residents of sensitive urban areas have lower chances of finding a job. Residents of France's most deprived neighborhoods have an increased risk of being unemployed, and address-based discrimination targeting residents of France's peripheral urban areas is prevalent in job and housing markets (Rathelot, 2014; Aeberhardt et al., 2015).

Methods

In order to examine the hypotheses, the Results chapter will include two main sections. In the first section, I will present descriptive results and characterize immigrant and natives socio-economic and socio-demographic disparity patterns across native women and immigrants in general and by origin groups. The second section will present a multiple linear regression analysis, predicting the effect of motherhood and immigration in addition to the effect of motherhood and region of origin on the wages of women in the French labor market.

Immigrant women might have unobserved characteristics that may cause lower rates of employment, and numerous factors can affect women's decision to seek work. Therefore, in order to account for the selection bias into employment of different groups of women, a two-step Heckman procedure for wage prediction will be performed. In the first step, I used a probit model explaining the selection of women into employment. In the second step, I estimated the wage equation correcting for selection by incorporating a transformation of these predicted individual probabilities as an additional explanatory variable. For the model to be identified, I chose a selection variable that affects the probability of employment, but not wages directly. The standard variables such as marital status, age, years of education were used, as well as including an "***urban sensitive area***" affecting the probability of being employed but not necessarily the level of earnings. The regression models will be performed for native-born women and for each origin group of immigrants separately. The linear model can be represented by the following equation[20]:

$$y = a + b_i x_i \quad (1)$$

where $\boldsymbol{y}$ is the log of yearly income, and $\boldsymbol{x}$ is the vector of individual characteristics, including the existence of children by age group, type of occupation, marital status, age, years of education, and weekly working hours. The reason for performing regression analysis for each group of immigrant status (i.e., native, first-generation immigrants) separately is multipurpose; first, it allows us to understand not only the interaction between immigration status and motherhood, but also the interaction between immigration status and the other control variables, such as marriage and education. Moreover, it also enables us to distinguish between the cost of the region of origin and the cost of immigration. Finally, estimating the motherhood effect for each immigrant group separately allows us to account for some of the heterogeneous characteristics across the different groups of women.

To illustrate the results, different profiles of women will be displayed by immigration status and motherhood. The income of women in the French labor market, will be calculated for each group with and without children for a 37 year old woman[21], working 35 h weekly[22], in a low white-collar type of occupation[23] with 10[24] years of education, married, with children under 18 (7–18 years old) and under 6 (0–6 years old).

CHAPTER 3: ANALYSIS AND FINDINGS

Descriptive Overview

This section introduces the descriptive socio-demographic and socio-economic characteristics of the analyzed sample comparing native French women and immigrant women (**Table 1**) and across origin groups (**Table 2**). Since second-generation immigrant women were born in France and have different socio-demographic and socio-economic characteristics than the first-generation population, I chose to compare the first generation of immigrants to the entire native-born population[25].

The descriptive overview (**Table 1**) presents the socio-economic characteristics of (1) native-born French women and (2) all foreign-born women pooled together, as well as an

[20]In order to determine if the immigrant population (foreign born) bears a disproportionate negative motherhood effect compared to native mothers, the regression coefficient of motherhood of the foreign-born group will be compared to the coefficient of the native-born group. Whether the differences between the coefficients of motherhood in the regression models for each group are statistically significant will be tested using the following equation:

$$z = \frac{\beta_1 + \beta_2}{\sqrt{(SE\beta_1)^2 + (SE\beta_2)^2}}$$

Where β1 is the coefficient for natives, β2 is the coefficient for first-generation immigrants, and SEβ1 is the estimated standard error of the coefficient for natives, and SEβ2 is the estimated standard error of the coefficient for immigrants.

[21]The predicted probabilities are for 37 year old women since this is the average age of my sample.

[22]Full-time weekly working hours in France.

[23]The illustration of the result will be presented for women working in low white-collar occupations since the largest rate of women work in that kind of occupation in the French labor market.

[24]Native women have 11.36 years of education on average, immigrants from Europe 10.41, and immigrants from the Maghreb and sub-Sahara have 8.45 years of education and 8.93 years of education respectively. Therefore, I chose to illustrate the different profiles of women by the average years of education across groups−10 years of education.

[25]As the aim of this study is to analyze the effect of motherhood on immigrants compared to the effect of motherhood on native women, I decided to include the entire native-born population in the native-born group, regardless of their immigration background (second and third generation of immigrants). Moreover, the second generation are likely to have lower motherhood penalty compared to first-generation immigrant mothers as second-generation immigrant women are supposed to be proficient in French and be more familiar with French culture compared to the first-generation. They are also likely to have developed family or professional networks, which can influence their employment outcomes in a different manner than first-generation immigrant mothers.

TABLE 1 | Descriptive statistics by immigration status (aged 18–50).

	All population (mothers and childless, employed and not employed)		Employed mothers only	
	Native-born	Immigrants	Native-born	Immigrants
Children 7–18%	34%	32%	60%	59%
children under 6%	26%	37%	40%	41%
Employed%	78%	54%		
Yearly wages (only for employed women)	€18,772	€16,808	€19,196	€16,313
(std deviation)	(10,827)	(11, 741)	(11,125)	(11,797)
Low Blue collar	4.6%	10.9%	4.2%	11.4%
High Blue collar	6.6%	5.4%	5.7%	4.8%
Low White collar	74.7%	70.2%	75.8%	71.8%
High White collar	14.1%	13.6%	14.2%	11.8%
Married %	44%	65%	58%	69%
Years of education	11.36	9.22	11.99	10
(std deviation)	(3.91)	(5.2)	(3.53)	(5.09)
Age	36.49	37.57	38.25	39.13
(std deviation)	(8.87)	(8.10)	(6.82)	(6.91)
Number of children	1.78	2.01	1.70	1.79
(std deviation)	(1.01)	(1.26)	(0.74)	(0.86)
Weekly working hours	34.56	32.9	33.84	32.1
(std deviation)	(9.54)	(11.89)	(9.24)	(10.69)
Years since immigration		18.97		
(std deviation)		(12.73)		
FR nationality%	100%	43%	100%	56%
N	73,180	11,896	29,675	3,505

SOURCE: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

additional panel for employed mothers only, for each group of women. The results suggest that the rate of women with children in the household is higher among the immigrant population than the rate of women with children among the native born. The rate of women with children between 7 and 18 years old is quite similar for both groups, with a slightly higher percentage of children between 7 and 18 years old among native born women (34 vs. 32%). The rate of children under 6 years old is the highest among the immigrant population (37 vs. 26%). Among employed mothers, both native-born women and immigrants have a similar rate of children under 6 years old and under 18 years old (around 60% of children between 7 and 18 years old and 40% of children under 6 years old).

The employment rate is higher among native French born women (78%) than among the foreign born population (54%). The average income is calculated for employed women only (women working more than 5 h weekly). Native-born women earn on the average 2000€ more than first-generation immigrant women. As for employed mothers, native-born women earn as much as 3000€ more than employed immigrant mothers. Most women work in low white-collar types of occupations and the rate of women working in low white, high blue and high white-collar occupations are quite similar for both immigrants and native-born populations. It should be noted, however, that many more immigrants work in low blue-collar type of occupations compared to the native-born population.

Table 2 presents the socio-economic and socio-demographic characteristics of women aged 18–50 by region of origin and immigration status. The table is divided into 3 groups: (1) first-generation immigrant women from Europe, (2) first-generation immigrant women from Maghreb, and (3) first-generation immigrant women from sub-Saharan Africa.

Table 2 presents the socio-economic characteristics of foreign-born women for each origin group, as well as an additional panel of employed mothers only for each group of women. The results in **Table 2** suggest that immigrants from Maghreb and sub-Sahara have the highest rate of women with children (30% + 43% = 73% for immigrants from Sub Sahara and 74% for immigrants from the Maghreb) and in particular have the highest rate of children under 6 years old (43%).

The primary set of results are consistent with the literature suggesting that immigrant women from developed countries of origin have better labor market outcomes than immigrants from poor countries. Immigrant women from Europe are the group with the highest employment rate after native women. The descriptive results support the assumptions regarding the level of traditionalism with regard to gender roles in the country of origin, and immigrants from the Maghreb seem to suffer from the lowest employment rates (43%). Although gender ideology prevailing in sub-Saharan countries promotes economic participation of women, immigrants from sub-Sahara seem to do worse in terms of employment rates than immigrants from Europe; however, they appear to do much better compared to immigrants from Maghreb. The average annual wage is calculated for employed women only. Noticeably, the highest average income is among immigrant women from Europe (€18,772). Once more and as expected, immigrant women from Europe seem to be positively selected in the French labor market as they benefit from the highest income compared to immigrants from other regions of origin. The group with the lowest average annual income is the first-generation of immigrant women from sub-Sahara (€15,245)[26]. Among employed mothers, the income of immigrants from Europe is still the highest and is similar to the income of employed mothers in general. however, the income of employed mothers from Maghreb and sub-Sahara seems lower among employed mothers compared to employed women from the same origin group. The highest rate of high white-collar

[26]Foreign-born women from Maghreb are the group with the highest rate of married women (72%) followed by immigrant women from Europe. Immigrants from sub-Saharan Africa have one of the lowest rates of married women (47%). Immigrants from Maghreb are the least academic group, with only 8.45 years of education on average followed by immigrants from sub-Saharan Africa (8.93). The age ranges from 36.63 years old (among immigrants from sub-Sahara) to 38.56 years old (among the immigrant women from Europe) which may signify more experience for immigrants from Europe, since age can be considered a proxy for experience. Immigrant women from Europe are the group that works the highest number of weekly hours, after which are the native-born women (33.45); the first-generation immigrant women from sub-Sahara are the group working the fewest weekly hours (32.37).

TABLE 2 | Descriptive statistics by immigration status and region of origin (age 18–50).

	All population (mothers and childless, employed and not employed)			Employed mothers only		
	Immigr europe	Immigr magrheb	Immigr sub-Sahara	Immigr europe	Immigr magrheb	Immigr sub-Sahara
Children 7–18%	36%	31%	30%	65%	60%	50%
children under 6%	26%	43%	43%	35%	40%	50%
Employed%	68%	43%	58%			
Yearly wages (only for employed women)	€18,870	€16,044	€15,245	€18,686	€15,464	€14,732
(std deviation)	(13.220)	(11,135)	(9,493)	(13,788)	(11,307)	(9,009)
Low Blue collar	8.2%	12.5%	11.6%	8.7%	11.7%	12.7%
High Blue collar	5.8%	4.0%	3.5%	4.9%	3.6%	3.3%
Low White collar	69.5%	70.8%	77.3%	71.2%	72.8%	77.7%
High White collar	16.5%	12.6%	7.5%	15.1%	11.8%	6.2%
Married %	62%	72%	47%	70%	73%	54%
Years of education	10.41	8.45	8.93	10.56	10	9.33
(std deviation)	(5.03)	(5.11)	(4.93)	(5.01)	(5.01)	(4.87)
Age	38.56	37.76	36.63	39.62	39.88	37.95
(std deviation)	(8.14)	(8.36)	(7.86)	(6.70)	(7.21)	(7.04)
Number of children	1.74	2.16	2.17	1.60	1.88	1.97
(std deviation)	(0.82)	(1.06)	(1.39)	(0.71)	(0.88)	(1.01)
Weekly working hours	33.28	32.59	32.21	32.13	32.24	31.73
(std deviation)	(10.76)	(10.74)	(9.69)	(10.97)	(11.27)	(9.45)
Years since immigration	20.76	20.87	17.63	23.71	25.55	19.89
(std deviation)	(14.36)	(1379)	(10.77)	(13.81)	(12.68)	(10.56)
FR nationality%	36%	52%	47%	56%	72%	58%
N	3,619	4,024	2,252	1,229	998	809

SOURCE: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

are among immigrants from Europe and the lowest among immigrants from sub-Sahara. In addition, both immigrants from Sub-Sahara and immigrants from Maghreb seem to be overrepresented in low blue-collar type of occupation with little difference between employed mothers and employed women in general, suggesting low selectivity of these women into the French labor market.

REGRESSION ANALYSIS

The Consequence of Immigration Status and Motherhood Status on Wages

In this section I examine the effect of motherhood and region of origin on the annual income of women in the French labor market.

In order to estimate whether and to what extent motherhood status and immigration status affect the yearly income of women in the French labor market, I will present below two models of linear regression for each group of women separately according to their immigrant status. I will also present two models correcting for selection bias according to the two-step Heckman selection model (1979), in which the first generation will be compared to the native-born population.

Columns (2)–(4) are analogous to Columns (1)–(3) but correct for selection bias. The results in Column 1 show that the yearly income of native-born women with children under 18 years old is lower than the yearly income of native-born women without children, since the negative effect of children under 18 years old is statistically significant. Native-born women with children between 7 and 18 years old earn 4.5% less than women without children. Contrary to expectation, having children under 6 has a positive effect on wages for native-born women. Native-born women with children under 6 years old earn 4.9% more than women without children.

The results for the two-step Heckman model reveal that when correcting for selectivity, the negative effect of motherhood among native-born women (Column 2) for children under 18 years stays the same and the positive effect of young children on wages of native-born women does not change much either (4.5% instead of 4.9%). The Lambda term is statistically not significant. The results in Column 3 show that the effect of children under 18 years old on immigrants is not statistically significant. Moreover, contrary to native women, the effect of children under 6 years old on immigrant women is negative. First-generation immigrant women with children under 6 years old earn 6.9% less than immigrant women without children. Correcting for selectivity for the immigrant population (Column 4) renders the coefficient

of children under 18 years old much more similar to that of the native-born population. The negative effect of children under 18 years old becomes statistically significant (5.6% lower yearly wages) and the effect of children under 6 years old becomes statistically not significant. In contrast with the native-born population, the Lambda term is statistically significant and negative, meaning that among the immigrant women, the population with the highest probability to work will actually be the one likely to earn the least.

In order to test the hypothesis and to understand if there is a differentiated motherhood effect on immigrant women compared to native women, the statistical significance between the effect of children on native-born women and the effect of children on first-generation immigrant women is tested. The statistical significance test performed on the uncorrected models reveals that the difference between the native-born women and first-generation immigrants in the motherhood penalty for children under 18 years old, is not statistically significant. However, the difference between the effect of children under 6 years old on first-generation immigrants and such effect on native-born women is statistically significant[27]. The corrected significance test between the effect of children for the native-born and the first-generation immigrant population demonstrates, however, that the difference between them is not statistically significant for having children under 6 and for children between 7 and 18 years old[28].

Nevertheless, the premium observed for children under 6 years old among native women is counterintuitive, as one would expect that the motherhood penalty should be higher for young children that need extensive amounts of care, which is difficult to reconcile with high paying occupations. Moreover, if there would be a premium for motherhood in France, it would have been logical to observe it among mothers with older children, since scholars have often related the motherhood penalty to child rearing, caregiving, and family responsibility necessary primarily for younger age children (Anderson et al., 2003; Amuedo-Dorantes and Kimmel, 2005). However, it seems that the penalty observed in France for young children is not pronounced in terms of wages. A possible explanation for the motherhood premium for children under 6 years old could be the result of free daycare in France and family-friendly policies. Children have access to publicly subsidized home-based care, accredited family daycare providers, and nursery from a very young age (Lucifora et al., 2017). Moreover, motherhood penalty literature in the cross-national perspective has often revealed a smaller motherhood penalty in France and Belgium as well as in southern European countries.

Consistent with previous studies on the motherhood penalty for native women in France, the motherhood penalty is small (Budig et al., 2016; Cukrowska-Torzewska and Lovasz, 2020)[29]. The results on the French labor market show a mechanism where a penalty in terms of wages for children under 18 years old is observed. These results indicate a pattern of a long-term disadvantage as opposed to an immediate penalty. In fact, the penalty observed for women with older children might be as a result of a cumulative loss in human capital due to career interruption.

In order to display the results concretely and to understand the relative motherhood effect on immigrant women, the yearly wages of a woman in the French labor market are calculated for the native-born population and the first-generation immigrant population. The graph is based on **Table 3**, Model 1 and 3 (uncorrected for selection) and Model 2 and 4 (corrected for selection models), with and without children. The yearly wages are calculated for a 37-year-old woman, married, with or without children under 18 years old and with 10 years of education for each group separately. The graphs are presented for a woman with children under 18 years old, as the results above have demonstrated that the negative effect of children on women's wages are pronounced among women with children under 18. Moreover, taking into account children under 18 years old allows us to portray longer time effects of motherhood on wages.

As presented in **Chart 1** and based on the models uncorrected for selection, only native-born women with children under 18 years old suffer from a motherhood penalty in terms of yearly wages. Yet, contrary to expectation based on the uncorrected model, immigrants bear no motherhood penalty for children between 7 and 18 years old. However, based on the models corrected for selection (**Chart 2**), we can observe that both a native-born and an immigrant woman with children under 18 years old will suffer from a motherhood penalty in terms of yearly wages and the motherhood penalty of immigrant women becomes greater compared to native women. In addition, after controlling for selection, the income of immigrant woman becomes much lower as compared to the uncorrected model.

In summary, based on the results above, controlling for selection widens the pay gap between native and immigrant women in general. These results assert the existence of a selection bias into employment, yet the selection mechanism for the immigrant population is negative for

[27]The difference between the effects of working in high blue and low blue-collar types of occupation on the first generation compared to the native population is not statistically significant. The differences in the effect of marriage on the first generation compared to the native population is not statistically significant either. However, the differences in the effect of working in a high white-collar type of occupation on immigrants compared to native-born is statistically significant and adds much more to the yearly income of immigrant women when selection is not controlled for. Consistently with previous studies, years of education affect the immigrant population much less than the native population and each year of education among the native population adds 5% to the yearly wages compared to only 2.2% among the immigrant population. The difference in the effect of weekly working hours is significant as well, and each hour worked weekly is more beneficial to the first-generation immigrant population than to the native population. The effect of age is stronger for the native population which could significate that working experience adds much more to the income of native-born population than to the income of immigrants.

[28]The comparison between natives and immigrants on the effect of marriage, years of education, age and weekly worked hours is significant for the corrected model.

[29]Cukrowska-Torzewska and Lovasz (2020) reported a motherhood penalty of 4.5% per child while Budig et al. (2016) reported a motherhood penalty of 5%. It should be noted, however, that most studies analyzed the motherhood penalty for each child (number of children) or for having children or not and not for having children in two categories of age such as in the current study.

TABLE 3 | Regressions predicting the Logarithmic transformation of the yearly wages (LN income) of women in the French labor market (18–50 years old) according to their immigration status, and Heckman selection model correcting for selectivity.

	Natives		1st GEN Immigrant (foreign born)		Significance test between the models (uncorrected)	Significance test between the models (corrected)
	Uncorrected for selectivity	Corrected for selectivity	Uncorrected for selectivity	Corrected for selectivity	Natives and immigrants	Natives and Immigrants
	(1)	(2)	(3)	(4)		
Children under 18	−0.045***	−0.045***	−0.009	−0.056*	Not significant	Not significant
	(0.01)	(0.01)	(0.02)	(0.03)		
Children under 6	0.049***	0.045***	−0.069*	0.040	***	Not significant
	(0.01)	(0.01)	(0.03)	(0.04)		
LowBlue collar	−0.056***	−0.048**	0.002	−0.252***	Not significant	***
	(0.01)	(0.02)	(0.03)	(0.03)		
HighBlue collar	0.143***	0.156***	0.112*	−0.139*	Not significant	***
	(0.01)	(0.02)	(0.04)	(0.08)		
HighWhite collar	0.407***	0.414***	0.561***	0.349***	***	Not significant
	(0.01)	(0.01)	(0.03)	(0.06)		
Married	−0.066***	−0.065***	−0.059**	0.007	Not significant	***
	(0.01)	(0.01)	(0.02)	(0.02)		
Age	0.020***	0.021***	0.014***	0.007***	***	***
	(0.00)	(0.00)	(0.00)	(0.00)		
Educ years	0.050***	0.052***	0.022***	0.003	***	***
	(0.00)	(0.00)	(0.00)	(0.01)		
Weekly working hours	0.020***	0.020***	0.028***	0.027***	***	***
	(0.00)	(0.00)	(0.00)	(0.00)		
Constant	7.552***	7.473***	7.736***	8.673***	Not significant	***
	(0.02)	(0.11)	(0.07)	(0.25)		
Lambda		0.053		−0.585***		***
		(0.06)		(0.15)		
R-squared	0.275		0.293			
N cases	49,673	46,966	5,350	5,319		

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.
SOURCE: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

the immigrant population resulting in the yearly wages of immigrants in being even lower than without correcting for selection.

The Consequence of Region of Origin and Motherhood Status on Wages

To examine the effect of motherhood and the effect of country of origin, three models of linear regression will be performed (**Table 4**) for the three immigrant groups coming from different regions of origin, and the native-born population separately, as well as three models correcting for selection bias according to the two-step Heckman selection model (*1979*) for the three immigrant groups coming from different regions of origin, and for the native-born population separately[30]. In order to understand whether there is a differentiated motherhood effect on immigrant women from different countries of origin compared to native women, the significance between the effect of children on native women and the effect of children on each immigrant group of immigrant women will be tested for both the corrected and uncorrected models.

Columns (2)–(4), (6), and (8) are analogous to Columns (1)–(3), (5), and (7) but correct for the selection bias.

The results of Model 3 (Column 3; **Table 4**) suggest that there is no motherhood penalty in terms of wages on having a child under 18 years for first-generation immigrant women from Europe, both in the corrected and uncorrected models. Noticeably, the coefficient on children under 6 years is positive for first-generation immigrant women from Europe; that is, there is a motherhood premium on having children under 6 years old. Having children under 6 years adds 8.6% to the annual income compared to first-generation immigrants from Europe without children.

[30]For the sake of parsimony and in order to ease the comparison between the different groups of immigrant and native women, the native Model analyzed in the previous section is added to **Table 4**.

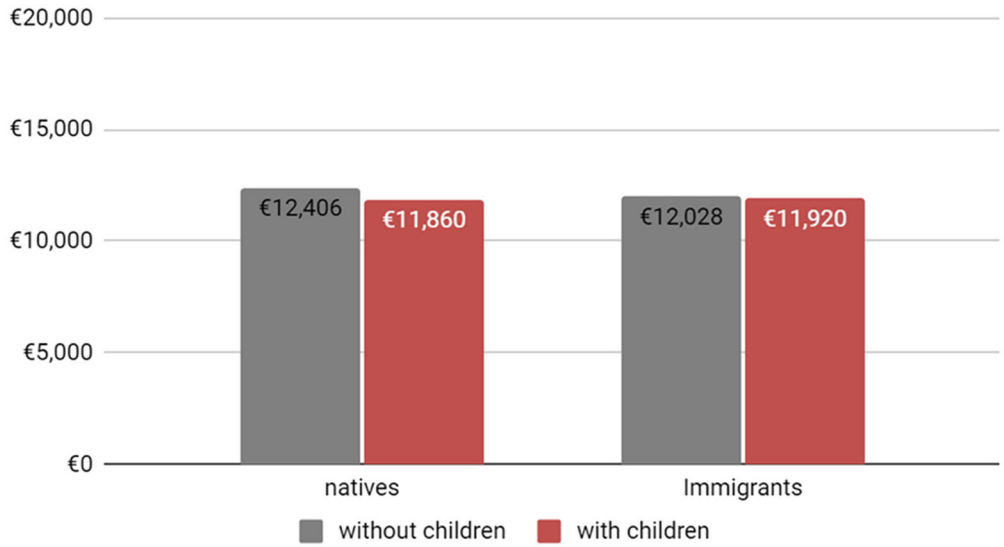

CHART 1 | Yearly income of women in the French labor market by immigration status and children **uncorrected** for selection (under 18 years old). SOURCE: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

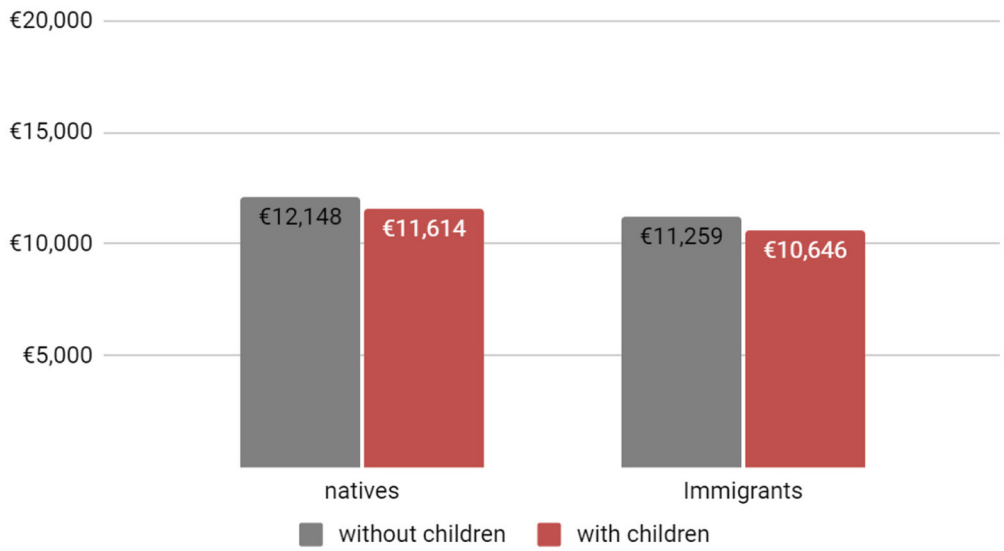

CHART 2 | Yearly income of women in the French labor market by immigration status and children **corrected** for selection (under 18 years old). SOURCE: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

Model 5 (Column 5), indicates that there is a motherhood penalty in terms of wages for immigrants from Maghreb both for children between 7 and 18 years old and for children under 6 years old. Immigrants with children under 18 years from Maghreb earn 10.9% less than childless immigrants from Maghreb. The negative effect of having children under 6 years old on the annual income of immigrant women from Maghreb is even stronger and immigrant mothers with young children earn as much as 18% less than childless immigrant women from Maghreb.

The results of Model 7 (Column 4) indicate that the coefficient for children between 7 and 18 years old is not statistically significant for immigrant women from sub-Sahara. However, the effect of children under 6 years old is negative and significant. Having children under 6 years old for immigrant women from sub-Sahara lowers the annual wages by 13.8%. Notably, the

TABLE 4 | Linear Regression predicting the logarithmic transformation of the yearly income of women in the French labor market according to the region of origin and motherhood status (18–50 years).

	Natives		1st Gen Europe		1st Gen Maghreb		1st Gen Sub-Sahara	
	Uncorrected for selectivity	Corrected for selectivity	Uncorrected for selectivity	Corrected for selectivity	Uncorrected for selectivity	Corrected for selectivity	Uncorrected for selectivity	Corrected for selectivity
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Children under 18	−0.045***	−0.045***	0.037	−0.002	−0.109**	−0.127**	−0.014	−0.140
	(0.01)	(0.01)	(0.03)	(0.05)	(0.05)	(0.05)	(0.06)	(0.12)
CHILDREN under 6	0.049***	0.045***	0.086**	0.196**	−0.180***	−0.059	−0.138**	0.079
	(0.01)	(0.01)	(0.04)	(0.08)	(0.06)	(0.17)	(0.06)	(0.08)
LowBlue collar	−0.056***	−0.048**	−0.017	−0.172	−0.009	−0.264	0.052	−0.289
	(0.01)	(0.02)	(0.05)	(0.11)	(0.06)	(0.20)	(0.07)	(0.22)
HighBlue collar	0.143***	0.156***	0.189**	−0.018	0.121	−0.052	0.049	−0.290
	(0.01)	(0.02)	(0.06)	(0.14)	(0.10)	(0.17)	(0.11)	(0.26)
HighWhite collar	0.407***	0.414***	0.551***	0.309**	0.565**	0.421***	0.485***	0.172
	(0.01)	(0.01)	(0.05)	(0.14)	(0.07)	(0.13)	(0.09)	(0.22)
Married	−0.066***	−0.065***	−0.044	0.002	−0.096**	−0.026	−0.044	−0.101
	(0.01)	(0.01)	(0.03)	(0.05)	(0.05)	(0.07)	(0.05)	(0.10)
Age	0.020***	0.021***	0.013***	0.007	0.017***	0.011*	0.012***	−0.004
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.02)
Educ years	0.050***	0.052***	0.019***	0.010	0.027***	0.006	0.020***	−0.010
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.02)	(0.01)	(0.02)
Weekly working hours	0.020***	0.020***	0.026***	0.026***	0.025***	0.025***	0.034***	0.034***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Constant	7.552***	7.473***	7.862***	8.679***	7.699***	8.513***	7.661***	9.581***
	(0.02)	(0.11)	(0.10)	(0.45)	(0.14)	(0.70)	(0.16)	(1.13)
Lambda		0.053		−0.693		−0.432		−1.158
		(0.06)		(0.37)		(0.31)		(0.67)
R-squared	0.275		0.320		0.272		0.255	
N cases	49,673	46,966	2,050	1,982	1,498	1,463	1,101	1,062

	Significance between models (Uncorrected Models)			Significance between models (Corrected Models)		
	Natives and 1st gen Europe	Natives and 1st gen Maghreb	Natives and 1st gen sub-Sahara	Natives and 1st gen Europe	Natives and 1st gen Maghreb	Natives and 1st gen sub-Sahara
Children under 18	***	Not significant	Not significant	Not significant	Not significant	Not significant
Children under 6	Not significant	***	***	Not significant	Not significant	Not significant
LowBlue colar	Not significant	***	Not significant	Not significant	Not significant	Not significant
HighBlue colar	Not significant	Not significant	Not significant	Not significant	Not significant	Not significant
HighWhite colar	***	***	Not significant	Not significant	Not significant	Not significant
Married	Not significant	Not significant	Not significant	Not significant	Not significant	Not significant
Age	***	***	***	Not significant	Not significant	Not significant
Educ years	***	***	***	***	***	***
Weekly working hours	***	***	***	***	***	***
Constant	***	Not significant	Not significant	***	Not significant	Not significant
Lambda				***	Not significant	Not significant

*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. Source: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.*

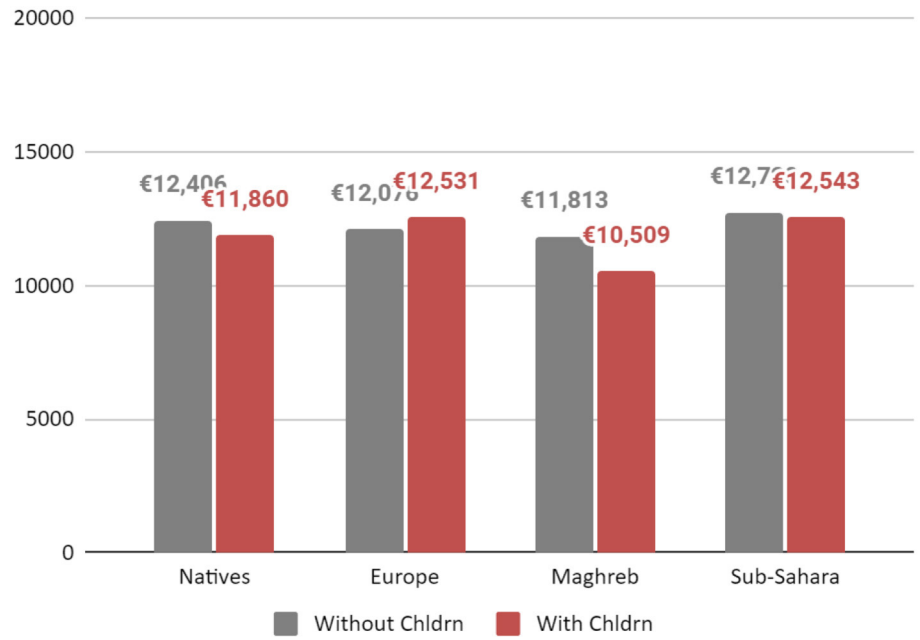

CHART 3 | Yearly income of a woman in the French labor market by immigration status and children (under 18 years old). Source: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

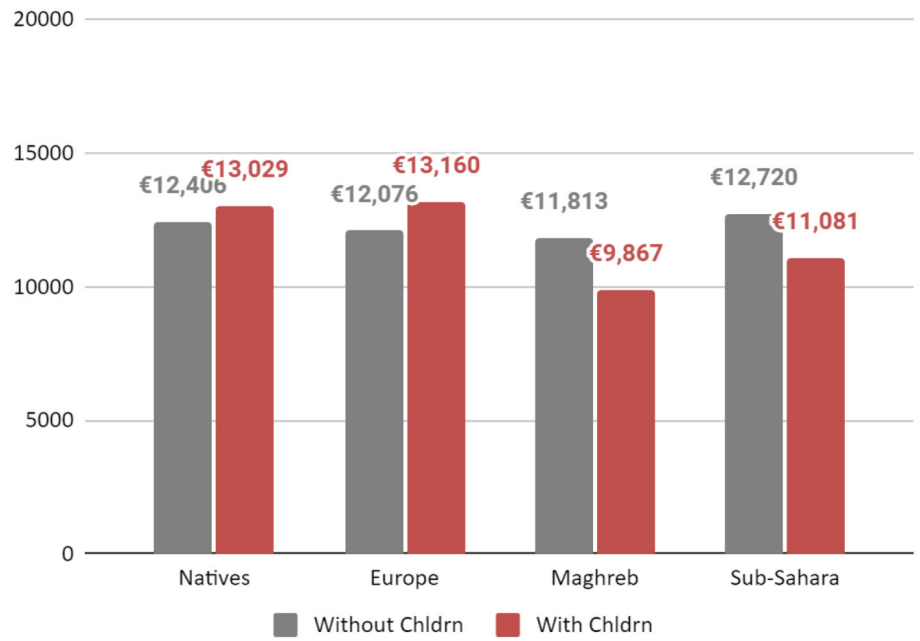

CHART 4 | The yearly income of a woman, in the French labor market according to origin groups and children under 6 years old. Source: Enquête sur les revenus fiscaux et sociaux (ERFS), INSEE 2009–2012.

Lambda terms are not statistically significant in the corrected selection models across all groups[31].

In order to understand whether there is a differentiated motherhood effect on immigrant women compared to native women, the significance of the difference between the effect of children on native women and the effect of children on immigrant women from different regions of origin is tested. The significance test demonstrates that the differences in the effect of children under 18 years old on first-generation immigrants from Europe and native-born women are statistically significant, while the differences between the effect of children under 18 years for natives and immigrants from Maghreb and sub-Saharan Africa are not statistically significant.

The difference in the effect of child under 6 years old on first-generation immigrants is statistically significant between native-born women and first-generation immigrant women from both Maghreb and sub-Saharan Africa. Immigrant women from sub-Sahara and from Maghreb suffer from a significant wage penalty compared to native mothers of children under 6 years[32].

Although, immigrant women from Maghreb seem to have the highest return on education compared to every other immigrant group, the results of the effect of children on the yearly wages show evidence of them being particularly disadvantaged by motherhood. Consistently with previous studies and research hypotheses, women immigrating from Maghreb, bears additional penalty on being married, and each hour worked rewards them less than any other group. Women from Maghreb suffer from a motherhood penalty on both children under 18 years old and children under 6 years old.

First-generation women from Sub-Sahara are also a disadvantaged group. They have the lowest benefit of age and the lowest return on education from all groups. These results suggest that their wages are dependent primarily on the hours worked and less on education and experience; typically, the lower paying types of jobs. Moreover, they suffer from a significant motherhood penalty for children under 6 years old.

Finally, and consistent with the hypothesis of this research, the least disadvantaged group in terms of motherhood penalty are immigrants from Europe, who have a statistically significant motherhood premium for younger children and bear no penalty for children under 18 years old. The effect of marriage on yearly wages is not significant and their return on education is better than immigrant from Sub-Sahara.

In order to display the results concretely, **Chart 3** demonstrates the differences between each group in terms of their relative motherhood penalty for having children between 7 and 18 years old and **Chart 4** presents the differences in the relative motherhood cost for each group for having children under 6 years old. The annual wages of a woman in the French labor market are based on **Table 2**, Models 1, 3, 5, and 7[33]. The wages are calculated for a 37-year-old woman, working in a low white-collar occupation, married, with or without children (under 6 and between 7 and 18 years old) and with 10 years of education for each group separately.

As shown in **Chart 3**, and contrary to every other group, an immigrant woman from Europe with children under 18 experiences no motherhood penalty in the French labor market. However, a motherhood premium cannot be asserted since the coefficient for having children between 7 and 18 for immigrants from Europe was not statistically significant. An immigrant woman from sub-Sahara with children under 18 earns nearly the same wages as an immigrant woman from sub-Sahara without children. An immigrant from Maghreb will be the woman suffering the most significant motherhood penalty for having children between 7 and 18 years. As expected, and as seen in previous results, a woman from Maghreb will also earns less than all other groups even if childless.

As it appears in **Chart 4**, both a native woman and immigrant woman from Europe with children below age 6, will experience a motherhood premium although the premium is much greater for immigrants from Europe. By contrast, both immigrants from the Maghreb and sub-Sahara will have a motherhood penalty for children under 6 years old. The most significant motherhood penalty for children under 6 years old, however, will be for an immigrant from the Maghreb.

DISCUSSION

Give the absence of research focusing on the interactive effect of immigration and motherhood on women's earnings, this study seeks to contribute to the body of literature on gender and immigration by analyzing the interactive effect of motherhood, immigration, and region of origin on women's labor market integration in France. Although prior research has identified numerous factors shaping the motherhood penalty at both the individual and the contextual level, to the best of my knowledge no earlier study has examined the relative motherhood cost for

[31]The results for the two-step selection model were not statistically significant for children between 7 and 18 years old among immigrants from Europe but were statistically significant for children under 6 years old and reveal a greater motherhood premium for young children compared to the uncorrected model. The two-step selection model reveals a similar effect as the uncorrected model for children between 7 and 18 years old among immigrants from the Maghreb. However, the effect of children under 6 years old for immigrants from the Maghreb becomes statistically not significant in the corrected model. The effect of children between 7 and 18 years old on immigrants from sub-Sahara remains statistically not significant when correcting for selection. However, it should be noted that while the effect of children under 6 years old was statistically significant in the uncorrected models, this effect becomes statistically insignificant in the corrected selection model. In the corrected models, the differences between the coefficients of the native-born population and the immigrant population becomes not significant for children under 18 across all groups. The differences between the effect of children for natives and immigrants are significant only for children under 6 years old between natives and first-generation immigrants from Europe. The Lambda term of the Heckman models is negative for all immigrant groups (although it is statistically not significant).

[32]The effect of marriage on the immigrant population compared to the native population is not statistically significant across all groups. The effect of age is statistically significant between natives and all immigrants groups. The comparison of the effect of years of education between native and immigrants is statistically significant across all immigrant origin groups, and years of education affect the immigrant population much less than the native-born population. As a matter of fact, compared to the native-born population, each year of education has the highest positive consequence on the annual income of first-generation immigrants from Maghreb, and the lowest positive consequence on first-generation immigrants from sub-Sahara.

[33]The graphs are based on the uncorrected models since the Lambda term were not significant in any one of the corrected for selection models.

immigrant women, as compared to native-born women, with reference to the origin group of the immigrant.

It is well-established in the literature that the cost of immigration varies among different immigrant groups. Factors such as the cultural similarity of the country of origin with the culture of the host country, the level of economic development of the country of origin and religious similarity can shape the selection mechanism of immigrants (Stier and Tienda, 1992; Raijman and Semyonov, 1997; Hondagneu-Sotelo, 2003; Inglehart and Norris, 2003; Diehl et al., 2009). When evaluating the economic integration of immigrant women, however, the literature often fails to consider the difference between immigrant women with children and those without children, the cost of motherhood for the immigrant, and how the region of origin of these women may affect the cost of motherhood.

This study focused on immigrant women from three major regions of origin—Europe, the Maghreb, and sub-Saharan Africa. Specifically, I attempted to perform the following analysis (1) An examination of whether immigration status and motherhood affect women's wages and to what extent, (b) An examination of the effect of the motherhood penalty on the wages of immigrant women compared to native women (interactive effect) (c) An analysis of the effect of motherhood on women's wages across immigrant groups from different regions of origin.

Using the "Enquête des Revenus Fiscaux et Sociaux," 2009–2012 (INSEE, 2009, 2010, 2011, 2012), the results of this study confirmed that the motherhood disadvantage is not uniform across the different origin groups of immigrant women. The results support the hypothesis regarding a lower wage for immigrant mothers as compared to childless immigrants. In addition, the results are consistent with the hypothesis regarding a greater motherhood penalty for immigrants in general for children under age 6. Moreover, the results supported the hypothesis regarding an interactive cost between the region of origin and motherhood for immigrant women. The findings assert the existence of a greater motherhood penalty which is especially pronounced for immigrant mothers coming from less economically developed countries and immigrant mothers coming from traditional countries with regard to gender roles (mothers from the Maghreb and sub-Saharan Africa). Indeed, immigrants from the Maghreb experienced the worst motherhood penalty in terms of income; they had a motherhood penalty both for having children under 18 years old and for children under 6 years old. Immigrants from sub-Sahara also experienced a significant motherhood penalty for children under 6 years old; however, they did not suffer from a motherhood penalty for older children (7–18 years old). Immigrants from Europe had no motherhood penalty—not for having children between 7 and 18 years old, and they even had a premium for having children under 6 years old. It seems that in accordance with the research hypothesis, immigrants from Europe did better than immigrants from the Maghreb and sub-Sahara. They did even better than native mothers, since while they had no penalty whatsoever, native mothers by comparison had a small motherhood penalty for children under 18 years old (7–18).

Contrary to the working assumption, young children had a positive impact on wages for native women and immigrants from Europe. Not only did these results highlight the importance of considering children's age when investigating the motherhood penalty, they are also extremely interesting as they may suggest a different approach to employment for mothers depending on the age of their children. While children often have negative long-term consequences on wages, these results could be revealing a particularly positively selected group of women with specific attributes, observed or not observed, that are necessary to overcome barriers existing for mothers, especially immigrant mothers of young children.

Although this study has evaluated the interactive effect between immigration status and motherhood status across origin groups, an important limitation needs to be taken into account when interpreting the findings. First, it may be problematic to rely on cross-sectional data for measuring both the motherhood penalty and the economic integration of immigrant women. Indeed, without using longitudinal data, it is impossible to assert a stronger negative effect of motherhood as a result of immigration. However, the rationale behind this study was first and foremost to provide evidence of the importance of considering intersectionality when studying gender, especially when related to immigration. As such, this research establishes that motherhood, immigration, and origin intersect one another, resulting in a combined impact, exceeding their independent and cumulative effects.

Moreover, the effect of the employment patterns of partners were not taking into account in the analysis and thus prevented me from examining its effect on women's employment outcomes. Moreover, partner employment patterns could affect immigrant women especially in the event of tied migration. Unfortunately, these parameters were not provided in the data.

The findings presented in this study contribute to the literature on motherhood and immigration by providing evidence on the intersection of motherhood, immigration, and region of origin in shaping inequality in the labor market. Consequently, this study is not limited to the ways in which motherhood interacts with immigration—it also suggests how mechanisms such as discrimination of immigrants and mothers by employers, lack of transferability of human capital, the effects of partners employment pattern, but also cultural values and social norms related to gender roles, may possibly influence immigrant labor market outcomes in the host country. Moreover, by choosing France, a principal destination of immigration in Europe and where gender, culture, tradition, and the integration of immigrant subgroups is a constant feature of public and academic debates, this study provides a new perspective on the role of motherhood, when intersected with countries of origin in the immigrant integration process.

This research further contributes to the immigration and motherhood literature by suggesting that motherhood could be one of the main mechanisms shaping the disadvantage in the labor market for immigrant women compared to immigrant men. Indeed, while women can be seen as primary movers if neither married nor possessing family responsibilities—under such circumstances their individual wellbeing and success is their main motivation for immigration. By contrast, women with children are more likely to be tied movers. Working on the assumption that the gender gap is likely to be more pronounced for tied migrants, and that women with children are more

likely to be tied movers, this study suggests that motherhood could be, as a matter of fact, one of the main mechanisms shaping gender inequality for immigrants in contrast to French natives. Such a finding could motivate further research on the specific motherhood penalty experienced by immigrants, occurring as a result of their immigration experience, as a result of their disadvantaged status or as a result of their distinct cultural attributes.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Materials**, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fsoc.2022.748826/full#supplementary-material

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The Need for Parental Support for Migrant Parents in Transition Into Sweden: A Perspective

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Migration is a stressful experience and research shows that newly arrived migrants in Sweden suffer from different challenges and struggle to relate to parenting in a new culture that is different from their own. The Swedish Child Health Services (CHS) focuses on promoting health among children, as well as supporting parents in parenting. Although this is a goal, migrant parents participate at lower rates in parental support groups. This paper aims to discuss how the Swedish CHS can support these families and address the need for improvement in the parental support offered to migrant parents during transition into their host country. In addition, this paper also aims to review and discuss the advantages of using a community-based participatory research approach together with the Swedish CHS to identify and apply culturally appropriate support programs to increase health literacy among migrant parents. The Swedish government decided to place greater emphasis and resources on supporting parents and promoting equal health among families in Sweden, with special emphasis on migrants and other vulnerable groups. This report from the Swedish government indicates the importance of creating knowledge about new ways, methods, and actions that may be needed to increase this support. One suggestion of this paper is to provide culturally appropriate healthcare work using a community-based participatory research approach, where migrant parents themselves are actively involved in the development of support programs. This approach will not only provide migrant families knowledge and support, it will also build on their needs and the challenges they can share, and receive support to overcome.

Keywords: parental support, migrants, child health care, Sweden, culturally acceptable

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INTRODUCTION

Migration is a stressful experience (1) and research shows that migration-related events can contribute to stress (2). After migration and arrival in a new country, the migrant usually must wait for the asylum process to proceed, and this wait can worsen the mental health of some migrants (1, 3). Sweden has historically been a welcoming and recipient country for migrants with a refugee background (which we in this current paper address as migrants) and during 2015 around 160,000 migrants applied for asylum as refugees in Sweden (4). During 2020, there was a decrease in the number of refugees entering in Sweden, due to the pandemic and only 13,000 refugees applied for asylum that year. The countries from where the refugees are coming from have differed during the

years. In the beginning of 1990, mainly refugees from ex-Yugoslavia were applying for asylum due to the war situation there and during 2015, Syria was highly representative among new-coming refugees in Sweden (4). During 2020, Syria followed by Uzbekistan and Iraq had the highest numbers of refugees entering Sweden (4). Sweden has an establishment program for all newly arrived refugees attaining refugee status in Sweden and this is a 2-year program containing Swedish studies, society and health communication and activities for getting into the employment market in Sweden (5, 6). When refugees are active within this program, they are entitled to receive economic supply for themselves and their children (5). During the last years, there have been some restrictions on refugees' rights to receive their partners and children into the country and if they should unite as families, the newly arrived migrant in Sweden has to ensure financial support for the whole family (7). New research from the research-based platform of migration and health shows that newly arrived migrants in Sweden suffer in various ways after arrival (8, 9). For example, many families suffer from challenges concerning living conditions, and others experience mental suffering due to separation from family or extended family (10). New qualitative research in Sweden concerning migrant families' situations indicate that they also struggle with parenting in a culture different from their home countries' (10). Another Swedish study on refugees and health, shows that refugees are suffering to a high proportion of mental ill-health and low quality of life (11). During the recent pandemic, it has been evident that migrants residing in Sweden, have been suffering to a higher degree related to COVID-19, unmet healthcare needs and it has increased their social vulnerability (12). According to Samarasinghe (13), migrant families face a complex transition when they try to navigate and establish themselves in the host country. This research points to the importance of nurses working closely with migrant families, and the need for nurses to understand the socio-contextual environment in which migrant families live, in order to be able to help them navigate this process. Moreover, Samarasinghe claims that when families originating in collectivistic-oriented cultures seek refuge in individualistic-oriented cultures, which emphasize the autonomy of the individual, migrants risk interpersonal conflicts due to a change in the nature of cultural values and family roles in the host country (13). Recent research on parenting among asylum seekers in Sweden shows that these parents were reporting that they felt like they had few rights, had concern about practical issues such as money and housing, had a constant fear of being repatriated and these factors increased the mental ill-health among these parents as well as among their children (14). Since we know the complex situation that migrants face when transitioning into a new country and the challenges that they can face as a family (10, 13), it is important to highlight and evaluate the support that Swedish Child Health Services (CHS) can give these families. Therefore, this paper aims at discussing how the CHS can support these families and address the need for improvement in the parental support that is offered migrant parents during their time of transition into the host country. In addition to that, the paper also aims at looking at this support program from a community-based participatory research approach and with the aspect of how important health literacy is when aiming at reaching and supporting migrants.

CHS PARENTAL SUPPORT

Families with children between 0 and 5 years of age are most often regularly attend the Swedish CHS (15). And all children residing either legally or illegally are eligible for CHS service which is also free of charge. CHS is a well-established organization with the aim of reducing morbidity, mortality and disability among children between 0 and 5 years (14, 15). Through regular visits to the CHS, children's development is closely monitored and vaccinations are also given (15). The primary goal of the CHS is to promote equal health and prevent diseases among children. To achieve this goal, the CHS aims to offers support not only to children but also to parents so as to enhance their parenting skills which may further help create favorable conditions for the overall development of the children. An additional focus is also set on providing additional support particularly to parents and children in vulnerable and disadvantaged situations such as migrants who have a higher risk of developing ill health or already experience impaired health (16, 17). This goal of working toward equal health for all children is also emphasized by the UN Convention on the Rights of the Child (UNCRC), ratified in 1989 (18), of which Sweden was one of the first signatories (19). This treaty states the rights for all children, including migrant children in Sweden, regardless of their respective families' residency status. Although the CHS in Sweden has this goal, the parental support program that is offered to all parents during the child's first year does not reach everyone, since not all parents are willing to participate in these programs (16). It has been observed that migrant parents and parents with lower levels of education are especially hard to reach, and attend meetings with CHS nurses at lower rates (16). There are other examples of migrants being difficult to reach within CHS and one such example is screening for post-partum depression. Research related to screening for post-partum depression among migrant women in Sweden show that they are not offered screening to the same proportion as the rest of the women and that they do not agree to participate to the same extent as the other women in Sweden (20, 21) even if the proportion of migrant women that suffer from post-partum depressions are higher than the rest of the population (22). Prior studies have also shown that untreated post-partum depression may have negative consequences on health of both mothers and children. Prolonged post-partum depression in mothers which remains untreated has been shown to affect cognitive functioning among young children, while adolescents in the household have also seen to develop violent behavior, as well as psychiatric and medical disorder. In order to prevent these adverse problems, the CHS has taken measures to offer early and effective parental support to migrant parents, which often do not reach the mothers given cultural and contextual barriers.

Several Swedish studies conclude that there is a need for improvement regarding the cultural competence (knowledge, skills, etc.) among nurses working within CHS (23). This makes

it difficult for them to adjust healthcare to families' needs (24–26). Cultural competence is required and crucial, since research shows that migrants suffer to a high degree from post-traumatic stress syndromes (27), which in turn might affect their parenting ability, but also require understanding from nurses that engage with them. Moreover, in a study involving Somalian migrants in Sweden, regarding their perceptions of their need for support in their parenting roles (28), parents described needing information on how to culturally adapt and improve their parenting, as well as obtain support from the authorities.

In 2018, the Swedish government placed greater emphasis and resources on supporting parents, aiming, through with a support program, to increase health equality among families in Sweden, with a special emphasis on groups such as migrants, that could be in need of extra support (29). This governmental initiative highlights the importance of acquiring knowledge about new means, methods and actions to improve support, in order to reach equality of health among all families (29).

We can conclude, then, that in general, migrants lack trust in societal institutions and people working in them (8, 9). However, among migrants, there is a high level of trust for the CHS (8, 9). We will argue below that this trust should be built on in working with migrant parents in Sweden. Although, based on these discussions it is clear that this support program is a promising initiative, there is a need for knowledge regarding what the support program should include and how they can be adapted to the actual needs of the parents.

THE ASPECT OF HEALTH LITERACY AMONG MIGRANTS

Another important aspect relating to child health care for migrants in Sweden is health literacy. Health literacy refers to the ability of individuals to acquire and understand basic health information and instructions in medical and healthcare contexts, together with the ability to access crucial health services and support systems. It therefore concerns an individual's ability to make decisions about their own health, and their family's (30, 31), and it is crucial for their empowerment (32). Health literacy amongst migrants has generally been found to be low (33) and associated with overall poor health, sub-optimal experiences with healthcare, and a tendency to abstain from seeking healthcare (34). A large part of this challenge arises from language difficulties, which result in this subgroup being ill-informed about how the healthcare system works (35), unaware about their healthcare entitlements (36), and often confused or distrustful following experiences where they feel that nobody is taking responsibility for their care, as when they are sent to different healthcare units without sufficient assistance or guidance (37). Health literacy is an important determinant of health and closely related to health inequalities (38). With health inequalities growing and seemingly becoming the norm rather than the exception in Sweden and other European countries (39), it has become imperative to address and eliminate health inequalities through a range of initiatives, such as increasing health literacy among migrant groups. In particular, it is important to consider this when planning new ways of working with migrant parents in order to ensure them parental support in a culturally appropriate way and to ensure not only that the migrants understand but that they are also are able to apply the information and support that they receive from these kinds of programs. A recently published research also highlights the increasing need to focus on elevating health literacy especially during the acute situations as the recent pandemic, to ensure that migrants understand as well as can access the support and care they need during these times (40). Another Swedish study on health literacy among refugees emphasizes the need for health literate health organizations that can meet the challenges that refugees face and further also suggests that health-professionals must give more importance to the aspect of health literacy (41).

NEW METHODS WHEN WORKING WITH MIGRANTS

Research shows that health programs and interventions for health literacy are more effective when they are culturally appropriate (42) and that, when they are culturally appropriate, that these programs and interventions could improve migrants' access to information and possibilities for enhanced health literacy (42). It has been a persistent problem that migrants lack trust in the Swedish health care system for reasons that include differences in structure and practice from the healthcare systems of their native countries (12, 43). Migrant health care support programmes seem to have little or no success since the clinical staff within the health care systems fail to understand the unique health and social needs of migrants, have the knowledge and skills to motivate them to the value of these support programs (44). One solution to this problem, is that researchers work together in an equal partnership with the parents and stake holders from CHS with a goal to define the problem and identify collaborative interventions for families to better support theirs needs during their transition in the host country (45, 46). Community-based participatory research (CBPR) is a collaborative effort, where knowledge is co-created in this context, given that it involves engaging immigrants not only in identifying their own problems, but also to resolve them together with concerned stakeholders such as healthcare professionals (47). CBPR is a model for building on the strength and resources of communities through connecting different stakeholders to citizens, and working collaboratively to achieve health-related community goals. In contrast to traditional systems, where citizens approach healthcare, in the CBPR-approach health providers, together with other stakeholders from the public, private, and non-profit sectors, reach out to the citizens in their own environments, in order to identify and resolve the health-related challenges of the communities in partnership with them (48). Such a method facilitates the creation of a "neutral" environment to co-create knowledge in otherwise neglected communities and enhance their ability to autonomously take control over their health and well-being (49). This emphasis on acquiring ability and autonomy is connected to a general idea and ideal, namely, that all citizens should be empowered to take control over their lives

(50). Previous research with migrant families from disadvantaged neighborhoods used a participatory health approach, using dialogue-based teaching where families participated in reflective dialogue sessions facilitated by professionals in relevant fields, and, in doing so, addressed challenges that emerged from the very needs of the community (51). The CBPR approach is inspired by Brazilian pedagogue Paulo Freire's "culture circles," where the aim is to nurture a participatory experience with a focus on dialogue and reflective action following an emancipatory health education (52). This approach rests on the assumption that actions taken for social change to improve community health should start from building on the strengths of communities through involving them equitably in the process of knowledge mobilization (52).

The crucial step in this approach is trust building, as described in the above-mentioned study (51), especially given the migrants' mistrust in the healthcare system and even in academia. Trust building promotes prolonged engagement, which leads to increased social support and positive peer influence within the group. As part of this previous study, healthcare staff, including dieticians, nurses, and dentists, initiated health-educational sessions with interactive presentations, followed by dialogic exchange, experience sharing, and reflection processes, with migrant families (51). The results of focus-group evaluations made with families following these reflective dialogue sessions showed that the interactive dialogues and discussions promoted health-related changes among these socially disadvantaged immigrant families. In addition, the families perceived that these sessions were more informative and practically useful, given that they were adapted to their needs compared with the short encounters with personnel in primary care centers or at dental clinics, which were most often irrelevant, since the advice or information provided, e.g., in pamphlets, were adapted to a general Swedish audience (51). Another important finding is that this method's multi-stakeholder perspective, where professionals work in partnership with local communities, has the potential to build trust between the community and the healthcare system (51).

CBPR has been used in the context of health promotion particularly among migrants for over three decades given that it primarily focuses on problems regarded by the communities themselves with the aim of combining knowledge and action to bring about social change and further to facilitate integration, improve health of the community members and there by contribute to reducing health inequalities (47, 53). Aside of its application in public health and health promotion, CBPR has also been widely used by primary care practioners in the past decade to address common health problems, noticed in primary care such as perceived access to care and disparities in chronic disease management among vulnerable groups including migrants (45, 54). Although CBPR approach has not been previously applied in the context of promoting health literacy by child health care services elsewhere, it has been proven effective in parental educational programs aiming to improving immunization rates among immigrant children in the United States (55). Further, several community-based parental web programs to promote parenting skills among Latino migrants in the United States developed and implemented using a CBPR approach showed that the program not only promoted power sharing and building trust among community members but also enhanced parents adherence to the program (56).

DISCUSSION

Migrant parents face a complex situation and challenges both for themselves and their children when trying to navigate in a new country, and during this transition it is important for health professionals working and engaging with these families to know and understand that complex situation and the challenges they face. Although the CHS has set a goal of reaching all parents with a parental support program, we know that migrant parents participate at lower rates. Even if this is the case, migrants have shown high levels of trust in the CHS compared to other societal institutions or healthcare settings (8, 9). This trust is a foundation that can be built upon. One reason for this trust might be the continuity of care often seen within CHS, where the same nurse meets specific families over time. Continuity of care, then, might be one general way to better succeed in reaching and supporting migrant families with or without children. This could work as a model for other countries with similar high reception of migrants and with needs of adapting child health care to suit the needs of migrant groups that could enter a country.

For example, a study among migrant parents from Somalia residing in Sweden showed that the parents perceived a need for information on how to culturally adapt and improve their parenting (28). Moreover, it was found that it is important that interventions offered to migrant parents are also culturally adapted in order to reach them and meet their needs (57). Given that Somalians are one of the migrant groups in Sweden there is a need for similar studies with other migrant groups in Sweden, since it has emerged from other studies that migrant parents have believed that parenting is challenging in a country with a culture quite different from their own (10, 28). This also goes for addressing sensitive sexual health information (29), where the information provided is preferably provided by health communicators with backgrounds similar to those of the newly arrived (58). Thus, it is important to provide culturally adapted services and, if possible, facilitated by a multidisciplinary team where professionals work in close collaboration with select members of the community known as lay health promoters or brokers from similar backgrounds (59, 60) when working with sensitive health issues. This suggests the need for community engaged and participatory approaches in educational programs that are intended for migrant groups.

Moreover, several sources have highlighted the importance of working in collaboration with parents and families. The International Society for Social Pediatrics and Child Health (61) have emphasized the importance of listening to the migrants regarding child health care. They also emphasize the need for working closely with other sectors of society when engaging with migrant families (61). Such collaborations might be one further means of culturally adapting the support program to the needs of migrant parents in Sweden.

This discussion paper has raised one possible way of working collaboratively with families to achieve a goal of promoting health by using the CBPR approach that has been successfully applied in a Swedish neighborhood predominated by families of migrant background (51). The model helps facilitate the creation of a safe environment where the migrant families can express themselves more readily and, with support from healthcare professionals and other stakeholders, can possibly enhance their empowerment, and therefore also their ability to take responsibility for their family's health and well-being (49). This approach, then, seems to be a way of not only providing migrant parents and families with what health professionals and researchers believe and assume they need, but to build upon these parents' and communities' perceptions of their needs. This is also much in line with the recommendation of The International Society for Social Pediatrics and Child Health (61). Yet another advantage of working with a CBPR approach is that researchers involved in the development and implementation of the intervention continuously study the processes initiated. This means that the results of the research conducted will, while facilitating families to take control over their health and lives, also create more knowledge about how such change processes evolve and can be improved as well as inform its application in other similar settings.

Engaging migrant parents in the research process can be challenging, however there are several approaches to address these challenges including initiating a trust-building process so as to initiate the establishment of equitable and sustainable partnerships with the community, therefore we propose the use of lay health promoters to reach out to these parents and work with the CHS and the researcher within the research process. Furthermore, migrant parents often perceive language barriers that may hinder communication during the research process that may also motivate their disengagement from such initiatives, however the use of lay health promoters also as interpreters ensures effective communication between the parents and the societal stakeholders including those in CHS.

Furthermore, CBPR relies on power sharing structure for joint partnership. In the child health care, the professionals have a certain level of interpretive precedence which limits their understanding of the actual needs of the parents and CBPR approach can neutralize such power imbalances. The CBPR suggest a bottom-up approach where power is said to be balanced in the partnership between health care personnel and the communities, although challenges may occur owing to shift of power; and changing the traditionally constructed organizational system. Swedish health and social care are vertically organized institutions with a top-down approach where the decisions are already made at the top levels thus ignoring the crucial input of the communities that benefit from these decisions (62, 63).

To sum up, in the proposed approach lay health promotors act as bridges between the CHS personnel and the migrant parents, helping to establish trust in the partnership, while also communicating the cultural nuances of the community to the health care staff. The proposed work also does not demand large organizational decisions that may be time consuming to arrive at, but more a change in work context and approach to health promotion among individual professional in CHS at a local level working in collaboration with the academic researchers.

CONCLUSION

Future work by healthcare professionals aiming to provide parental support to migrant parents in Sweden should aim to take an inclusive approach, such as that of CBPR, so as to maximize the potential effect of the support programs to promote health among migrant children.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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