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Transnational ties, endowment with capital, and health of immigrants in Germany: cross-sectional study

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Abstract

Aim Maintaining transnational ties may be an indication of poor integration into the host society (according to classical 'assimilation theory') or may convey additional capital resources to immigrants (the 'transmigrant' view of migration). Consequences for health would be negative in the first and positive in the second scenario. We tested the hypotheses that (1) maintaining transnational ties may lead to unfavourable health outcomes via outflow of resources and (2) transnational ties convey additional resources, thereby leading to improved health outcomes. An alternative hypothesis (3) is that the different forms of capital are an intermediate variable in the association between transnational ties and resource flows on the one hand and health on the other (mediation).

Subjects and methods We conducted a cross-sectional analysis using data from the German Socio-Economic Panel (SOEP). Transnationality was measured by "financial transfers to country of origin", "personal relations", "transnational identification", and "cultural practices". Capital was measured as follows: economic: income; cultural: education; social: visits by friends, membership in associations. Logistic regression was used to assess determinants of low satisfaction with health (outcome), adjusting for age, sex, and socio-economic status, considering capital endowment.

Results Among $N = 1589$ migrants, the chances of higher satisfaction with health decreased significantly with higher age (OR = 0.29), being a blue-collar worker (OR = 0.74), not being a blue- or white-collar worker (OR = 0.56), and living alone (OR = 0.67) and increased with high capital endowment (OR = 2.13). In the fully adjusted model, transnational ties showed no association with health satisfaction. We found no evidence that transnationality is an effect modifier in the association between capital endowment and health and that capital endowment is a mediator in the association between transnational resources and health.

Conclusion We found no evidence that immigrants who maintain close transnational ties (personal contact/sending remittances) to their country of origin are not sufficiently "integrated" into German society and will hence experience worse health (assimilation theory). However, they do not experience major health benefits from maintaining transnational ties either.

Keywords Transnationality · Migrants · Assimilation theory · Transmigrants · Health satisfaction · Social determinant · Health inequality · Germany

Introduction

Germany is an immigration country. More than 20% of the population have a migration background, meaning that either they or their parents immigrated or have a foreign nationality (Statistisches Bundesamt 2015). On average, immigrants are

socio-economically disadvantaged compared with the majority population of the immigration country (Rechel et al. 2013; Razum and Samkange-Zeeb 2014). Given the strong association between individual socio-economic status (SES) and health, it is unsurprising that immigrants experience health disadvantages (Razum et al. 2008). However, immigrant communities are heterogeneous with respect to socio-economic and health indicators. One aspect contributing to this observation may be the transnationality of some immigrants: this means they have resources at their disposition that relate to transnational ties and practices that connect them to their country of origin. Such ties and practices may comprise, for example, the cross-border transactions of goods, remittances, ideas, and information that can be supportive (or detrimental) for good health. Transnationality of individuals and communities

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thus constitutes a marker of heterogeneity. It distinguishes immigrants (as well as non-migrants) as do other markers such as age, sex, ethnicity, or citizenship. Transnationality may vary in degree, ranging from low to high, rather than being a simple attribute of a person that is either present or not; it may also vary across spheres of social life, familial, economic, sociocultural, or political (Faist et al. 2013).

Frequently, transnationality has been conceptualized as a duality, meaning that maintaining transnational ties can convey either advantages or disadvantages to immigrants. Classical assimilation theories, which postulated a permanent and exclusive settlement in the host country, took a sceptical view of maintaining transnational ties regarding immigrants' incorporation into the host society (Snel et al. 2006). For example, if immigrants face liabilities due to remittances to their country of origin, the resource flows associated with transnational ties may negatively affect their socio-economic situation in the immigration country. Maintaining transnational ties may thus pose an obstacle to integration, at least in socio-economically disadvantaged strata of the immigrant population (Esser 2003; Esser 2004).

Partly as a critique of classical assimilation theories, a transnational perspective emerged in migration research that provides a more optimistic picture of pathways out of marginalization available to immigrants. Although immigrants increasingly experience limited opportunities for social mobility as well as racial and ethnic discrimination, they can rely on transnational ties for sociocultural and economic purposes (Glick Schiller et al. 1992; Portes 1996; Faist 2000; Smith and Guarnizo 1998). Transnational ties and practices often involve the flow of resources of various kinds, for example relatives coming from the country of origin to help care for immigrants who have fallen ill or kinship networks and friends who provide monetary or other material support. Similarly, some immigrants may benefit from using health care services in two countries (Razum et al. 2005). In short, immigrants are no longer only perceived as settled and assimilated into the host society, but being at home in more than one social world (Snel et al. 2006; Levitt 2003). Maintaining transnational ties thus turns today's immigrants into 'transmigrants' (Glick Schiller et al. 1992).

Transnational ties thus offer immigrants opportunities that are otherwise not available. Through political and sociocultural engagement the creation of more positive self-images and collective solidarity is considered to provide a 'protective layer against discrimination and contempt commonly found in the host society' (Portes 1999). Transnational ties may thus generate alternative routes to social mobility for those facing the risk of downward mobility, e.g. via direct support and transfer of resources from the country of origin. This may positively affect health via an increased SES and by acting as a buffer against discrimination experienced by immigrants (Schunck et al. 2014).

As transnational resources may not be available to all immigrants to the same degree, it is possible that the classical, national-state-focused measures of SES such as income do not validly reflect migrant-specific resources and liabilities, as these do not consider transnational ties and resource flows from, or to, the country of origin. In other words, classical measures of SES alone (which are "blind" to transnationality and at least some of the transnational resources involved) may substantially over- or underestimate the resources actually available to immigrants. This may contribute towards explaining the observation that the health of (recent) immigrants is not always in line with what would be expected from their often low endowment with "classical" measures of SES such as economic capital (Razum and Twadella 2002; Razum 2009). A similar line of argument may apply to Bourdieu's two other forms of capital, i.e. access to social capital, e.g. networks of friends, and cultural capital, e.g. education (Bourdieu 1983).

Thus, when studying health differentials that immigrants experience, not only their endowment with capital needs to be considered, but also their degree of transnationality. In particular, it needs to be established whether the presence of transnational ties and resources conveys health advantages (or disadvantages) over and above the effects of capital. We have shown these possible associations in our conceptual model in Fig. 1. The content of the grey box signifies the well-known association between endowment with capital and health: lower endowment would lead to poorer health status (Szreter and Woolcock 2004; Muntaner 2004). Age, sex, occupation, and living alone vs. in a partnership are known to affect health as well, so they
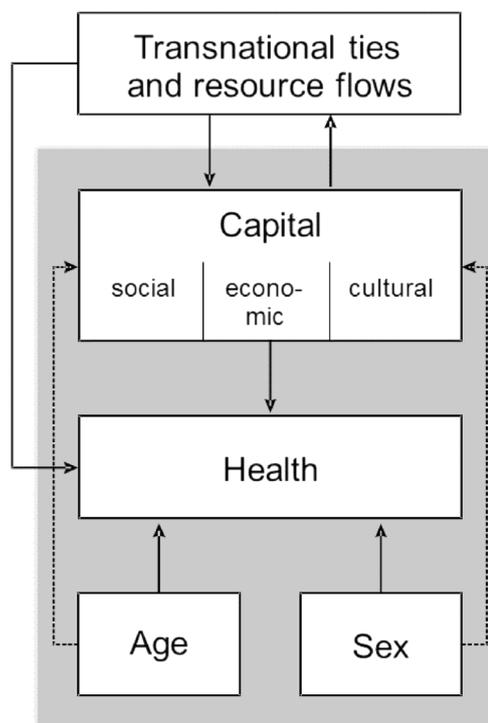

Fig. 1 Initial conceptual model

need to be controlled for when assessing this association. Transnational ties and resource flows are hypothesized to influence the primary association. "Resource flows" can be in both directions, i.e. from the country of origin or back to it. One possibility is that they strengthen (or weaken) endowment with capital (effect measure modification). In other words, the effect of capital on health may differ depending on the presence or absence of transnational ties and resource flows.

Investigating this association allows us to test (1) the hypothesis derived from classical assimilation theory, which implies that maintaining transnational ties may lead to unfavourable health outcomes via outflow of resources, and (2) the 'transmigrant' hypothesis, which implies that transnational ties are to some degree normal and may convey additional resources, thereby leading to improved health outcomes. A second possibility and thus an alternative hypothesis (3) is that the different forms of capital could be interpreted as an intermediate variable in the association between transnational ties and resource flows on the one hand and health on the other (mediation).

Testing the three hypotheses by investigating the associations outlined above will help understand whether transnationality is 'merely' a heterogeneity or actually contributes to the production of inequalities, in our case in health.

Methods

We conducted a cross-sectional analysis using data from the German Socio-Economic Panel (SOEP). The SOEP is a household panel set up in 1984 in which private households are followed. Interviews are conducted annually. The immigrant population was oversampled in the gross sample of the SOEP (in 1984 and in 1994/95) and has been replenished (in 2000 and 2009) to ensure a representative cross-section of immigrants in the net sample (Wagner et al. 2007; Gerstorf and Schupp 2014).

In our sample, we included only persons who had immigrated to Germany themselves, here termed as immigrants, and remained in the panel during 2006–2010. It was necessary to include a time period rather than just 1 year as not all variables of interest are included in the SOEP questionnaire in any given year. Due to sample size considerations, we did not stratify for country of origin of the immigrants. We measured the degree of transnationality by the presence or absence of transnational ties and resource flows using the four dimensions "financial transfers to country of origin", "transnational personal relations", "transnational identification", and "transnational cultural practices" (Fauser et al. 2015). Table 1 shows how we operationalised these dimensions following the approach published by Fauser et al., using seven indicators available in the SOEP.

Of the 1704 data sets, 403 have missing values, most frequently for the variables "has visited country of origin in the past two years" (n = 292; 17.1%) and "feels attached to country

Table 1 Dimensions of transnationality and proxy variables used to measure them (Fauser et al. 2015)

Dimension of transnationality	Proxy variable* used to measure it
Financial transfers	Sends remittances or goods to country of origin
Personal relations	Maintains regular contacts to friends abroad/in country of origin
	Has relatives abroad/in country of origin
	Has visited country of origin in the past 2 years
Identification	Feels attached to the country of origin
Cultural practices	Uses language of country of origin regularly
	Reads newspaper in language of country of origin

*Details on variables are given in additional Table 5

of origin" (n = 287; 16.8%). Missing values of all other variables are lower than n = 60 (< 3.5%). Logistic regression analyses with the above-mentioned indicators of transnationality as dependent variables and age groups, sex, income, and partner in same household show that the chance of missing values significantly increases with older age and living without a partner in the same household, whereas the effects of sex and income are not statistically significant. Imputations were performed for the variables "has visited country of origin in the past 2 years" and "feels attached to country of origin" using IVEware (University of Michigan 2014).

All seven variables describing transnationality were coded as "absent" (0 points) or "present" (1 point). Points were summed up and the median value (< median vs. ≥ median) was used for dichotomization (0–3 vs. 4–7 points) (see additional table 5).

We defined proxy variables for endowment with different forms of capital (economic, cultural, social), following the concept of Bourdieu. We measured economic capital in terms of net income per person, that is, total net household income adjusted for the number of household members according to the OECD-modified scale and grouped in terciles. For social and cultural capital we also had to rely on proxies (Fauser et al. 2015). Variables were coded as low (0 points), medium (1 point), and high (2 points). Again, points were summed up and the median value (< median vs. ≥ median) was used for dichotomization (0–2 vs. 3–6 points). We tested for correlation of variables used for indices and also for collinearity.

Our primary outcome measure, satisfaction with health in the year 2010, was measured on a Likert-type scale of 0 to 10 ("not at all satisfied" to "completely satisfied"). Due to small numbers in some of the 11 categories, two groups were defined by using the median: < median: 0–7 vs. ≥ median: 8–10 points).

We used logistic regression to assess the effects of transnational ties and of endowment with capital on satisfaction with health, controlling for age (grouped in three categories: 21–39 years, 40–64 years, and 65–94 years), sex, and type of job [blue collar, white collar, and others such as unemployed, pensioners, students, etc. (categories proposed by the

International Labour Organization 1988)] as well as living in a single household (no/yes).

We first established whether transnationality is an effect measure modifier in the association between capital endowment and health, i.e. whether the presence or absence of transnational ties and resource flows modifies the effect of endowment with capital on health, as postulated in hypotheses (1) and (2). For this purpose, we included an interaction term (transnational ties * capital) in the model and then tested for homogeneity. We also tested for interaction of employment status with capital and transnationality, respectively.

In a last step, we assessed whether capital forms are intermediate variables between transnational resources and health, as postulated in hypothesis (3) (see Fig. 1). Direct effects, indirect and total effect were assessed using an SAS macro by Valeri and VanderWeele (2013).

Results

Our study sample of immigrants in Germany comprised 1589 individuals; 54% were female, and the median age was 46 years. Table 2 conveys additional socio-demographic information.

The different variables relating to transnational ties and relating to endowment with capital, respectively, correlate only weakly (additional Table 6).

Table 3 shows the results of logistic regression analyses. We first assessed the association of transnational ties (model 1) and of endowment with capital (model 2) with satisfaction with health. In model 3, the outcome (health) is regressed on transnational ties and endowment with capital. In model 4, the outcome is regressed on transnational ties, endowment with capital, and covariates.

Table 2 Socio-demographic information on the study sample (immigrants in Germany)

Age groups *	21–39 years	40–64 years	65–94 years	Total
N	477	831	281	1589
%	30.0	52.3	17.7	100.0
Sex	Female	Male		Total
N	858	731		1589
%	54.0	46.0		100.0
International Classification of Occupations	White collar (1)	Blue collar (2)	(1) and (2) do not apply	Total
N	469	444	676	1589
%	29.5	27.0	42.5	100.0
Partner in same household	Yes	No		Total
N	1302	287		1589
%	81.9	18.1		100.0
Region of origin				
Turkey (n)	97	194	30	321
(%)	30.2	60.4	9.4	20.2
Resettlers (n)	175	172	78	425
(%)	41.2	40.5	18.4	26.8
Former Yugoslavia (n)	47	75	30	152
(%)	30.9	49.3	19.7	9.6
Italy (n)	20	68	18	106
(%)	18.9	64.2	17.0	6.7
Other regions (n)	138	322	125	585
(%)	23.6	55.0	21.4	36.8
All (n)				1589
(%)				100.0
Length of stay in Germany				
5–9 years				47 (3.1%)
10–19 years				415 (27.4%)
20–29 years				444 (29.3%)
30–39 years				344 (22.7%)
40+ years				267 (17.6%)
Missing values				72

*Details of all variables are provided in Table 5

Table 3 Odds of high satisfaction with health. Logistic regression model (bold figures: $p < 0.05$. Total $N = 1.589$)

Outcome: high satisfaction with health	Model 1		Model 2		Model 3		Model 4		
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	p Values
Transnational ties and resource flows									
High (vs. low)	0.98	0.80–1.20			0.95	0.77–1.17	0.93	0.75–1.17	0.5465
Endowment with capital (economic, social, and cultural)									
High (vs. low)			**2.52**	2.01–3.16	**2.52**	2.01–3.16	**2.13**	1.67–2.72	< 0.0001
Demographic variables									
Male sex (vs. female sex)							1.18	0.94–1.48	0.1536
Age 40–64 years (vs. 21–39 years)							**0.40**	0.31–0.51	< 0.0001
Age 65–94 years (vs. 21–39 years)							**0.29**	0.20–0.42	< 0.0001
Blue collar (vs. white collar)							**0.74**	0.56–0.98	0.0344
Neither white nor blue collar (vs. white collar)							**0.56**	0.42–0.74	< 0.0001
No partner in household (vs. partner in household)							**0.67**	0.50–0.90	0.0070

1. Model 1: outcome regressed on transnational ties and resource flows

2. Model 2: outcome regressed on endowment with capital

3. Model 3: outcome regressed on transnational ties and resource flows

4. Model 4: outcome regressed on endowment with capital, transnational ties and resource flows, and socio-demographic variables

The odds of higher satisfaction with health decline with increasing age, with living alone, and with having neither a blue-collar nor a white-collar job; male sex appears to be protective. Increasing endowment with capital is associated with higher satisfaction with health, after controlling for age, sex, and all other variables remaining in the model, including transnational ties. Length of residence in Germany was not significant and is thus not retained in the model. The index measuring transnational ties and resource flows shows no association with health satisfaction (OR 0.93, 95% CI 0.75–1.17).

Test for collinearity with all variables in model 4 shows variance inflation factors lower than 1.9. This means there is a weak effect of collinearity on the observed results.

We tested for effect measure modification and mediation in the associations of transnational ties and capital with health. The assumption of effect measure modification has to be rejected because the test for homogeneity (uniformity of strata of transnationality) was statistically not significant. In addition, there was no indication that capital is an intermediate variable between transnational resources and health as shown in Fig. 2 (results of analyses are provided in Table 4). There was also no statistically significant interaction (effect measure modification) of employment status with capital and transnationality, respectively.

Discussion

Main findings of the study

As could be expected, high satisfaction with health of immigrants is strongly and negatively associated with increasing age and with living alone and equally strongly but positively with economic, social, and cultural capital. To a lesser degree, health satisfaction is positively associated with male sex. In these respects, our findings are not different from studies in non-immigrant populations.

Contrary to our expectations, however, we could not show an association between transnationality and health satisfaction. Immigrants who retain close ties to their country of origin do not experience better, or worse, health satisfaction than those who do not, after controlling for age, sex, and endowment with capital. This is not what we expected to find, given the optimistic view of 'transmigrants' (Glick Schiller et al. 1992; Snel et al. 2006; Portes 1996; Faist 2000; Smith and Guarnizo 1998). However, these findings also speak against an interpretation that sees "homeland" ties as opposed to social inclusion and respective well-being in the immigration country (Esser 2003; Esser 2004). The only but presumably important exception to the pattern described here is visible in

Fig. 2 Mediation model
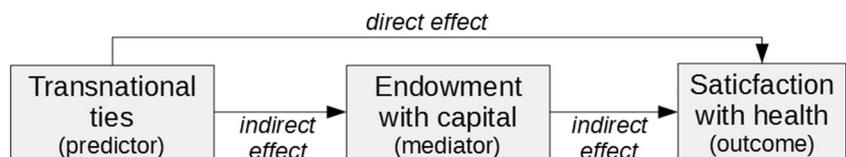
Table 4 Analysis of effect modification and mediation

Analysis of effect measure modification	OR	95% CI
Endowment with capital = high		
Transnationality = low	2.22	1.65–2.99
Transnationality = high	3.00	2.11–4.25
Test for homogeneity	Wald chi-square = 1.6540	$p = 0.1984$
Mediation analysis with covariates from model 4	OR	95% CI
Controlled direct effect (CDE) 1*	1.08	0.85–1.34
Natural direct effect (NDE) 2*	1.08	0.85–1.34
Natural indirect effect (NIE) 3*	0.96	0.91–1.00
Marginal total effect (MTE) 4*	1.03	0.81–1.27

1* CDE: "… expresses how much the outcome would change on average if the mediator were controlled at level m uniformly but the treatment (exposure) were changed from 0 to 1"

Mediator level used: 1 (endowment with capital = high), exposure = transnational ties and resource flows = high

2* NDE: "… expresses how much the outcome would change if the exposure were set to level 1 vs. level 0 but for each individual the mediator were kept at the level it would have taken in the absence of exposure"

Exposure level: 1 (transnational ties and resource flows = high)

3* NIE: "… expresses how much the outcome would change on average if the exposure were controlled at level a = 1 but the mediator were changed from the level it would take if a = 0 to the level it would take if a = 1"

4* MTE: "… can be defined as how much the outcome would change overall for a change in the exposure from level a = 0 to level a = 1"

*Definitions taken from: Valeri and VanderWeele (2013)

an individual indicator, the association of frequent use of the mother tongue, which does convey a disadvantage in terms of health satisfaction (data not shown). Income—and thereby, albeit indirectly, unhealthy working conditions—have been controlled for in our analysis, so this association is unlikely to be due to confounding. If frequent use of mother tongue indicates low German language proficiency (as our data imply), and if this is associated with low educational attainment, then the explanation for the observed association could at least in part be low health literacy in this immigrant subgroup (Kreps and Sparks 2008). (Our study design does not, however, allow excluding that frequent use of the mother tongue is not an indicator for strong transnational ties.)

Overall, we found no evidence for hypothesis (1) that immigrants who do not relax their ties to their country of origin pay a price in terms of social (in this case health) disadvantage relative to those who do. This also (albeit indirectly) implies that maintaining transnational ties and exchanging resources does not contribute to the production of inequalities relative to the majority population. This is in line with Pries who posits that there is not *one* paradigm of integration of immigrants and that certain forms should not be described as 'deficient' or 'backwards', as has been done by classical assimilation theory (Pries 2003).

The health satisfaction of immigrants who maintain strong transnational ties with friends or family in the country of origin may even be higher than that of immigrants with weak transnational ties. We cannot rule out, however, that some degree of reverse causality is involved (healthier individuals can maintain transnational ties more easily). Hence, our findings show only moderate support for the competing hypothesis (2) that strong transnational ties provide additional resources from which immigrants would benefit in terms of their satisfaction with health. Such additional resources not usually available to non-migrants may thus be one element, but certainly not the only one, of an explanation for the frequently observed paradoxical association between socio-economic status and health among immigrants (Razum and Twadella 2002; Razum 2009).

Our findings do not support our initial conceptual model outlined in Fig. 1, which posits that capital is an effect measure modifier (hypotheses 1 and 2) or intermediate variable (hypothesis 3) in the association between transnationality and health. Thus, capital and transnationality should be placed at the same level in a revised conceptual model, unlike in the one shown in Fig. 1. In a separate analysis (Fauser et al. 2015) we could show, however, that those immigrants who are endowed with higher capital tend to be the ones who maintain strong transnational ties (the direction of effect was not investigated in that study).

Strengths and limitations of the study

By using SOEP data, we could realize a sample size of roughly 1600 immigrants with complete/imputed data, which is

large compared with other immigrant studies. The target group was clearly defined according to their actual migration experience (and not to the usual but imperfect proxy of nationality). Also, our sample is supposed to be representative of immigrants in Germany, at least of the more established groups (Gerstorf and Schupp 2014; Wagner et al. 2007). Despite being large, the sample was too small to allow stratification by country of origin; thus, we cannot rule out that findings within particular immigrant groups with different cultural, educational, financial, and language background would differ from those in our total sample.

Our study has limitations in terms of measurement. The SOEP provides detailed information on the social and economic situation of the participants, which allowed us to define variables for social, economic, and cultural capital as well as for transnational ties. However, the SOEP was not originally conceived to assess transnational ties and resource flows. This means that some required information is not available. In particular, it was only possible to measure material resource flows (goods and money) but not other types of support. Moreover, in some cases the variables we used are proxies; while we believe they are the best possible way to measure the constructs of interest in our data set, they were not developed for this purpose and may not achieve optimally high validity. Thus, it could be that the variables we used to measure capital endowment do not in fact measure it adequately. A similar line of argument would apply to our outcome measure "satisfaction with health", which evidently is not the same as objectively measured health. The latter point is not a major limitation though because health satisfaction is known to be a reasonably valid measure of actual health. Our reliance on imperfect measures might explain why we found no association between transnational ties and resource flows and health. Finally, while we were able to adjust for the most common confounders such as age, occupation, and sex, we cannot rule out residual confounding by unknown confounders.

We had to combine data from 2006 to 2010 because not all information required to construct our proxy variables was collected in every annual wave of the SOEP. Consequently, some exposure variables precede the outcome by a number of years whereas others were measured in the same year. Our analyses thus implicitly assume that transnational ties and endowment with capital are reasonably stable over periods of up to 5 years.

The SOEP has not drawn a random sample of individuals but of households as the sampling unit (Wagner et al. 2007). It is likely that there will be clustering of relevant attributes by household. As the number of households was not constant, robust standard errors could not be calculated. Future analyses should consider multilevel modelling to estimate the proportions of the total variance that can be explained at the individual and household/area level, respectively (Murayama et al. 2012).

The design of our study was cross-sectional, so we cannot draw any conclusions regarding the direction of association or make causal inferences. To amend this limitation, a transnational panel needs to be set up that would allow longitudinal analyses. Such a panel would also help to overcome the methodological nationalism of the SOEP, which pictures mostly the German side of the transnational space immigrants populate.

Conclusions

In immigrant research, transnationality should be considered as a marker of heterogeneity, in line with other markers such as age or educational attainment. Our findings do not lend support to the—sometimes emotional—argument of classical assimilation theory that immigrants who maintain strong transnational ties are rejecting integration into the society of the host country, which allegedly would incur high social costs, e.g. in terms of health. Maintaining transnational ties thus is not a risk factor from the point of view of public health. A possible exception may be low proficiency in the German language and its possible association with low health literacy. As our study provided only indirect evidence, this aspect should be studied further.

At the same time, we did not find strong evidence that maintaining transnational ties is an effective strategy for immigrants for betterment in terms of health. Future research should elucidate the size and the effects of resource flows from the country of origin, which would also help to refine a conceptual model for associations among capital, transnational ties, and health among immigrants.

Compliance with ethical standards

Conflict of interest   The authors report no conflicts of interest.

Ethical approval   Not required as a Public Use File from the German Socio-economic Panel (SOEP) was used.

Appendix

Table 5 Variable description

Description	Items	Variable name (data set)	Generation	
Proxy variables (Table 1) transnationality				
Sends remittances or goods to country of origin	Remittances	bap15501, bap15504, bap15505, bap15508, bap15509, bap15512, bap15513, bap15516, bap15517, bap15520, bap15521 (bap)	0 =	Remittances are sent to none or only persons living in Germany ($n = 1427$)
			1 =	Remittances are sent at least to one person living abroad ($n = 162$)
				Nature, volume, and frequency of transfers were not taken into account
Maintains regular contacts with friends abroad in country of origin	Contact abroad	zp148 (zp)	0 =	No contact to friends abroad ($n = 360$)
			1 =	Contact to friends abroad ($n = 1229$)
Has relatives abroad	Nuclear family abroad	wp11702, wp11707, wp11709, wp11716, wp11719 (wp)	0 =	Spouse, mother, father, daughter, son are not living abroad ($n = 1077$)
			1 =	At least one of spouse, mother, father, daughter, son is living abroad ($n = 512$)
Has visited country of origin in the past 2 years	Visit to country of origin	bap147 bap148 (bap)	0 =	Visited country of origin never or at least not in the last 2 years ($n = 549$)
			1 =	Visited country of origin in the last 2 years ($n = 1040$)
Feels attached to country of origin	Attachment to country of origin	bap143 (bap)	0 =	Feels less than strongly attached to country of origin ($n = 380$)
			1 =	Feels strongly or very strongly attached to country of origin ($n = 1209$)
Uses language of country of origin regularly	Language of country of origin	bap133 (bap)	0 =	Speaks mostly German at home ($n = 1000$)
			1 =	Speaks partly German or language of country of origin or mostly language of country of origin ($n = 589$)
Reads newspaper in language of country of origin	Newspaper of country of origin	bap141 (bap)	0 =	Reads only German newspapers or no newspapers at all ($n = 684$)
			1 =	Reads at least sometimes newspapers of country of origin ($n = 905$)
Index transnationality (summarized proxy variables)			0	$n = 69$
			1	$n = 165$
			2	$n = 227$
			3	$n = 267$
			4	$n = 334$
			5	$n = 310$
			6	$n = 179$
			7	n = 38

Table 5 (continued)

Description	Items	Variable name (data set)	Generation	
Further variables (Table 2)				
Age groups	Age groups	Year of interview – year of birth gebjahr (ppfad)	1 =	21–39 years of age
			2 =	40–64 years of age
			3 =	65–94 years of age (n: see Table 2)
ISCO International standard classification of occupations (ISCO-88)*	Occupation	Is88$ ($pgen)	1 =	Blue collar (ISCO code 6100–9980)
			2 =	White collar (ISCO code 1110–5220)
			3 =	Other [−2 (does not apply)] (n: see Table 2)
	Partner	bap15202 (bap)	0 =	Yes
			1 =	No (n: see Table 2)
Capital variables (Table 3)				
Income terciles (terciles of equivalence weighted household income)	Income	i11102$, w11101$, d11106$, h11101$, y11101$ ($pequiv)	0 =	Lower tercile (n = 473)
			1 =	Middle tercile (n = 557)
			2 =	Upper tercile (n = 559)
Regular (at least once per month) visits of neighbours, relatives or friends	Visits	yp1802 (yp)	0 =	Visits neighbours, friends less often than once a month (n = 337)
			1 =	Visits neighbours, friends once a month or more often (n = 1252)
Amends social gathering at least weakly	Sociably	zp0305 (zp)	0 =	Meets neighbours, relatives, or friends less often than once a week (n = 866)
			1 =	Meets neighbours, relatives, or friends once a week or more often (n = 723)
Educational groups	High School	casmin85 (bapgen)	0 =	Less than high school (n = 570)
			1 =	High school (n = 697)
			2 =	More than high school (n = 322)
Index capital (summarized capital variables)			0	n = 50
			1	n = 170
			2	n = 322
			3	n = 375
			4	n = 388
			5	n = 204
			6	n = 80

*Ref: International Labour Organization. International Standard Classification of Occupations, ISCO-88. Online: http://www.ilo.org/public/english/bureau/stat/isco/isco88/ last access: 14.03.2017

Table 6   Correlation matrix

Correlation matrix

Transnationality	Exchange	Contact	Relatives	Visits	Bindung	Speak	Read	Capital	Social	Cultural	Economic
Exchange	*	0.138	0.150	0.131	0.043	0.069	0.037		0.002	0.134	0.140
Contact		*	0.286	0.233	0.296	0.288	0.140		0.116	0.032	0.044
Relatives			*	0.223	0.229	0.221	0.170		0.013	0.004	0.041
Visits				*	0.278	0.185	0.210		0.072	0.008	0.118
Bindung					*	0.256	0.234		0.044	−0.059	−0.052
Speak						*	0.312		0.061	−0.242	−0.172
Read							*		−0.002	−0.135	−0.120
Capital								*			
Social									*	−0.006	−0.008
Cultural										*	0.370
Economic											*

Dichotomized variables	Transn.	Capital
Transnationality	*	0.041
Capital		*

References

Bourdieu P (1983) Ökonomisches Kapital, kulturelles Kapital, soziales Kapital. In: Kreckel R (ed) Soziale Ungleichheiten, Soziale Welt, Sonderband 2. Göttingen, Schwartz, pp 183–198

Esser H (2003) Ist das Konzept der Assimilation überholt? Geographische Revue 5(2):5–22

Esser H (2004) Welche Alternativen zur Assimilation gibt es eigentlich? IMIS-Beiträge (23):41–59

Faist T (2000) The volume and dynamics of international migration and transnational social spaces. Oxford University Press, Oxford

Faist T, Fauser M, Reisenauer E (2013) Transnational migration. Polity Press, Oxford

Fauser M, Liebau E, Voigtländer S, Tuncer H, Faist T, Razum O (2015) Measuring transnationality of immigrants in Germany: prevalence and relationship with social inequalities. Ethn Racial Stud:1–23. https://doi.org/10.1080/01419870.2015.1005639

Gerstorf S, Schupp J (2014) SOEP wave report 2013. DIW, Berlin

Glick Schiller N, Basch L, Blanc-Szanton C (1992) Transnationalism: a new analytic framework for understanding migration. Ann N Y Acad Sci 645(1):1–24

International Labour Organization (1988) International Standard Classification of Occupations (ISCO). ISCO 88. http://www.ilo.org/public/english/bureau/stat/isco/isco88/index.htm; last access: 28 Nov. 2017

Kreps GL, Sparks L (2008) Meeting the health literacy needs of immigrant populations. Patient Educ Couns 71(3):328–332. https://doi.org/10.1016/j.pec.2008.03.001

Levitt P (2003) Keeping feet in both worlds: transnational practices and immigrant incorporation. In: Joppke C, Morawska E (eds) Toward assimilation and citizenship—immigrants in liberal nation-states. Palgrave Macmillan, Basingstoke, pp 177–194

Muntaner C (2004) Commentary: social capital, social class, and the slow progress of psychosocial epidemiology. Int J Epidemiol 33(4):674–680. https://doi.org/10.1093/ije/dyh200

Murayama H, Fujiwara Y, Kawachi I (2012) Social capital and health: a review of prospective multilevel studies. J Epidemiol 22(3):179–187. https://doi.org/10.2188/jea.JE20110128

Portes A (1996) Global villagers: the rise of transnational communities. Am Prospect 7(25):74–77

Portes A (1999) Conclusion: towards a New World—the origins and effects of transnational activities. Ethn Racial Stud 22(2):463–477

Pries A (2003) Transnationalismus, Migration und Inkorporation. Herausforderungen an Raum und Sozialwissenschaften. Geographische Revue 5(2):23–39

Razum O (2009) Migration, Mortalität und der Healthy-Migrant-Effekt. In: Richter M, Hurrelmann K (eds) Gesundheitliche Ungleichheit. Grundlagen, Probleme, Perspektiven. Wiesbaden, VS Verlag für Sozialwissenschaften, p 267–282

Razum O, Samkange-Zeeb F (2014) Populations at special health risk: migrants. In: Caplan M (ed) Reference module in biomedical sciences. Elsevier, Waltham

Razum O, Twadella D (2002) Time travel with Oliver Twist—towards an explanation for a paradoxically low mortality among recent immigrants. Trop Med Int Health 7(1):4–10

Razum O, Sahin-Hodoglugil N, Polit K (2005) Health, wealth, of familiy ties? Why Turkish work migrants return from Germany. J Ethn Migr Stud 31(4):719–739

Razum O, Zeeb H, Meesmann U, Schenk L, Bredehorst M, Brzoska P, Dercks T, Glodny S, Menkhaus B, Salman R, Saß AC, Ulrich RE (2008) Migration und Gesundheit. Schwerpunktbericht der Gesundheitsberichterstattung des Bundes. Robert Koch-Institut, Berlin

Rechel B, Mladovsky P, Ingleby D, Mackenbach JP, McKee M (2013) Migration and health in an increasingly diverse Europe. Lancet 381(9873):1235–1245. https://doi.org/10.1016/S0140-6736(12)62086-8

Schunck R, Reiss K, Razum O (2014) Pathways between perceived discrimination and health among immigrants: evidence from a large national panel survey in Germany. Ethn Health 1–18. https://doi.org/10.1080/13557858.2014.932756

Smith MP, Guarnizo LE (1998) Transnationalism from below, vol 6. Transaction Publishers, New Brunswick

Snel E, Engbersen G, Leerkes A (2006) Transnational involvement and social integration. Global Netw 6(3):285–308

Statistisches Bundesamt (2015) Bevölkerung und Erwerbstätigkeit. Bevölkerung mit Migrationshintergrund – Ergebnisse des Mikrozensus 2012. Wiesbaden, Statistisches Bundesamt

Szreter S, Woolcock M (2004) Health by association? Social capital, social theory, and the political economy of public health. Int J Epidemiol 33(4):650–667. https://doi.org/10.1093/ije/dyh013

University of Michigan, Institute for Social Research, Survey Research Center (2014) IVEware—Imputation and Variance Estimation. Ann Arbor/Michigan: University of Michigan. http://www.isr.umich.edu/src/smp/ive/, last access 6 March 2017

Valeri L, VanderWeele TJ (2013) Mediation analysis for exposure-mediator interactions and causal interpretation: theoretical assumptions and implementation with SAS and SPSS macros. Psychol Methods 18(2):137–150

Wagner GG, Frick JR, Schupp J (2007) The German socio-economic panel study (SOEP) – scope evolution and enhancements. Schmollers Jahr 127(1):139–170