

Does a lower self-concept explain mental health disparities of diverse immigrant youth from middle childhood to late adolescence?

Julian Busch (✉ julian.busch@rub.de)

Ruhr-Universität Bochum <https://orcid.org/0000-0003-4626-7045>

Carola Claus

Clinical Child and Adolescent Psychology, Ruhr-University Bochum

Silvia Schneider

Clinical Child and Adolescent Psychology, Ruhr-University Bochum

Rainer Georg Siefen

University Children's Hospital, Ruhr-University Bochum

Research article

Keywords: Self-concept, mental health, health disparities, immigrant, school, Germany

Posted Date: April 21st, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-23096/v1>

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Version of Record: A version of this preprint was published on April 23rd, 2021. See the published version at <https://doi.org/10.1186/s40359-021-00555-0>.

Abstract

Background: Three out of ten children in Germany have an immigrant background and this proportion will increase further. While immigrant youth has been found more vulnerable to developing symptoms of depression and anxiety, the underlying mechanisms of how such disparities develop across youth development are still understudied. Some previous research has found that immigrant youth are at risk of experiencing a less positive self-concept compared to non-immigrant youth. We investigated whether the self-concept is a mediator for such mental health disparities. Moreover, we explored variability in such associations from middle childhood to late adolescence.

Methods: Overall 1907 children and adolescents aged 5-18 years ($M=14$ years, $SD=3.03$, 49.8% female, $n=782$ with immigrant status) participated in a cross-sectional self-report survey in school settings using scales from the Beck's Youth Inventories II [1] to assess self-concept and symptoms of depression and anxiety. Links between the immigrant status, age, self-concept and symptom levels of depression as well as anxiety were examined in univariate regression models and moderated mediation models.

Results: Immigrant youth reported higher symptom levels of depression and anxiety than their non-immigrant counterparts but did not differ in their self-concepts. Across age groups, self-concept was a significant predictor for symptom levels of depression as well as anxiety, with stronger associations in adolescents. However, the overall hypothesized moderated mediation models were not supported as self-concept neither mediated the link between immigrant status and depression nor anxiety.

Conclusions: Our study substantiates previous findings that immigrant youth have increased levels of mental health problems compared to non-immigrant youth. However, our findings also show that immigrant youth do not have a more negative self-concept. The self-concept moreover does not seem to represent a mediator for internalizing mental health disparities. Findings from our study hence suggest that psychosocial interventions for immigrant youth do not require a specific emphasis on self-concept-related components. As our evidence suggests age-moderation of the self-concept on depression and anxiety, psychosocial interventions should consider developing a positive attitude towards the self especially for adolescents. Further research is needed to deepen the understanding of the mediating processes between migration status and mental health variables.

Background

About one-fifth of all children and adolescents in Germany experience mental health problems with symptoms of depression and anxiety being among the most common burdens [2, 3, 4]. Evidence is alarming, as developing a clinically relevant anxiety or depressive disorder during childhood and adolescence impairs the unfolding of developmental potentials and increases the risk for mental health problems during adulthood [2]. Notably, a higher risk for developing internalizing mental health problems has been reported for diverse groups of children and adolescents from immigrant families residing in European countries [5, 6] including newly arrived refugees [7] and those whose families have lived in the

resettlement country for the second or even third generation [8]. Increased levels of internalizing mental health problems are consistently found to be linked to severe psychological and social consequences among immigrant youth; while Plener et al. [9] found a higher prevalence of suicide attempts compared to their non-immigrant counterparts, van Oort et al. [10] substantiated links to the emergence of socio-economic disparities between immigrant and non-immigrant populations during adulthood.

As a growing number of children and adolescents in Germany, currently 36 per cent, has an immigrant status [11], research about the foundations of systematic differences in the mental health status between immigrant and non-immigrant youth is becoming increasingly relevant. Specifically, a better understanding of distinctive mechanisms is an important step to mitigate mental health disparities within diverse societies of tomorrow. A literature review on twenty global studies about immigrant youth in resettlement countries suggested a lower socio-economic status among immigrant families and within-family stress between first- and second-generation immigrants as potential mediators for increased levels of mental health problems among young immigrant populations [12]. These findings were critically discussed as the reviewed studies about mediating processes were conducted in different populations, applied varying methodology and, partially, yielded inconsistent evidence. Another recent literature review suggested factors such as language proficiency, sex, age and, again, socio-economic status to explain differences in health literacy among immigrant and non-immigrant populations that subsequently is linked to mental health disparities [13]. Further studies that adopted ecocultural perspectives found cultural distance [14, 15], social stress [6] and acculturative stress [16] to be linked to increased levels of internalizing mental health problems among immigrant youth.

However, determinants and mechanisms, as discussed in previous studies, so far have less focused on the question of how mental health disparities unfold within-person and have seldom considered differences across developmental periods. To shed light on such genuine developmental psychopathological processes, this study investigates the self-concept as a correlate for internalizing mental health problems during youth development. Self-concept is defined as the overall system of beliefs, cognitive and affective attitudes towards oneself. It summarizes a person's self-evaluation regarding specific aspects such as one's academic abilities, physical performance or capability of self-regulation [17, 18]. The self-concept constitutes intrinsic cognitive schemata mainly determined by feedback from social environments, e.g., via social comparisons or role ascriptions [19]. Self-directed feedback needs integration in order to form a coherent picture of the self. A low and instable self-concept has been linked to internalizing mental health problems, i.e., symptoms of anxiety and depression, among children and adolescents in general populations [20, 21, 22, 23, 24]. However, no study has yet focused on its distinctive significance for internalizing mental health problems in immigrant youth.

Although the previous evidence is inconsistent, some studies supported the notion that immigrant children and adolescents are vulnerable to a lower self-concept [25]. The immigrant status accordingly is a critical biographical characteristic for children and adolescents due to the increased risk of experiencing stigmatization that often results in self-insecurity. Even for those children and adolescents without personal migration experiences, their origin culture as conveyed by relatives and the migration experience

of parents or grandparents still forms self-ascriptions [26, 27]. Socio-cultural discontinuities between the family context and the host country's society can impede the development of a positive and coherent self-concept [28]. While immigrant children and adolescents are exposed to the host countries' influences in schools and peer-networks, they are often taught the language, traditions and values of the origin country at home [29]. This can result in the development of a "self-culture" whose principles are ambiguous, context-dependent, conflicting and which can be accompanied by symptoms of withdrawal and self-insecurity [8, 30]. Cultural discontinuities of immigrant youth could hence challenge the self-concept formation throughout youth development [31, 32].

Adopting a developmental science perspective, an inner focus on the emerging self-concept arises with an onset around puberty and peaks during adolescence [31]. Adolescence marks a hypersensitive period to all kinds of social stimuli when a coherent self-concept is formed via information seeking [33, 34]. Schools provide a central social context to establish a coherent self-concept. Since immigrant youth are at risk to especially experience cultural discontinuities between school and non-school contexts, forming a coherent and positive self-concept in schools could be particularly challenging for this group [35, 36]. Reviewing the research on immigrant children and adolescents in school-contexts, previous work has mainly focused on the academic components of the self-concept. However, a lower self-concept was considered a socially-determined and multi-directional pathogenic influence [37, 38], also impacting internalizing mental health problems [39]. It is hence necessary to extend research on the self-concept among immigrant youth to self-directed cognitions and emotions within school settings.

Investigating the role of the self-concept throughout youth development, our study goal was to better understand the foundations of increased internalizing mental health problems in immigrant children and adolescents. Specifically, our study hypotheses were to replicate findings that (H1) immigrant children and adolescents experience more internalizing mental health problems than non-immigrants, and (H2) that a lower self-concept predicted increased symptom levels of depression and anxiety. Based on this replication, we expected (H3) the self-concept to mediate the respective links between immigrant status and depression as well as anxiety, and (H4) that the effects on symptom levels of depression and anxiety are stronger during adolescence. All study hypotheses are illustrated in Figure 1A.

Methods

Procedure

We conducted a cross-sectional self-report survey in primary and secondary schools across the largest federal state of Germany, North-Rhine Westphalia. We chose schools in different regions (i.e., varying the degree of urbanization) and neighbourhoods and considered all types of secondary schools to balance the sample. At study enrollment, teachers informed parents using written handouts in several languages. Parents who agreed to having their children participate in the study signed an informed consent. All students in a classroom were eligible to participate as they presented their parental declaration of consent. Data were collected via classroom interviews with children aged from 7;0 to 18;2 years. As the

data collection adhered to a standardized administration protocol, no more than 8 participants per interviewer were assessed at once in secondary schools. For primary school children, group interviews with a maximum of 4 children per interviewer were conducted to increase levels of assistance, if necessary. Due to difficulties in the recruitment of primary schools, additional data collections were conducted in sports and social clubs for younger children following the same procedure. All interviewers were advanced undergraduate or graduate students in psychology, supervised by clinically experienced researchers.

Participants

Overall, 1907 children and adolescents participated in the survey. Two did not state their age, another 66 did not complete the demographic section about immigrant status of their parents or grandparents and were therefore excluded. This resulted in a total study sample of 1839. A large proportion of the sample comprised immigrant children and adolescents ($n=782$, 42.5%) with most of these being in the second immigrant generation. Immigrant youth originated from 69 different countries with Turkey ($n = 194$, 10.5%), Poland ($n = 111$, 6.0%), and Russia ($n = 42$, 2.3%) being the most frequent countries of origin. Immigrant youth came from families with a lower socio-economic status compared to non-immigrant youth. About half of the participants were female ($n = 49.8\%$) and participants were on average 14 years old ($SD = 3.03$). 76 participants were outside the defined age range, i.e., 8 participants younger than 7 years and 68 participants older than 18 years. Since exclusion of these students did not yield different results, they were included in the presented analyses. Table 1 reports basic socio-demographic information of the study sample.

Measures

The study questionnaire comprised a demographic section including participants' age, sex, migration status and the indicators for parents' socio-economic status to characterize the study sample. The highest number of the parental school years and parents' profession according to the International Socio-Economic Index of Occupational Status [40] were used to monitor the familial socio-economic status of the sample. To assess participants' internalizing mental health problems, subscales from the German version of the Beck's Youth Inventory-II (BYI-II) were used [41]. The BYI-II is a set of overall 5 self-report questionnaires with 20 items each for assessing depression, anxiety, self-concept, anger and disruptive behaviour. Participants use a 6-point Likert scale (1, "never" to 6, "always") to rate how frequently each statement has applied to their daily cognition, emotions and behaviours during the past two weeks. The BYI-II is designed for a large age range (7;0 to 18;0), as it operationalizes symptoms in easy language. In accordance with our study aims, the BYI-II questionnaires on depression, anxiety and self-concept were used in this study (Table 2). We rigorously adhered to the BYI-II manual for scoring and missing value handling.

Self-concept

The positively worded self-concept inventory (BSCI-Y) assesses cognitive and emotional perceptions of competency and self-worth. It comprises the overall system of self-directed perceptions cognitive and affective attitudes toward one's own person such as the perceived social role (e.g., "People want to be with me"), the personal strengths (e.g., "I am good at telling jokes") and self-acceptance (e.g. " I like myself "). The inventory showed good internal consistency (*Cronbach's a* for immigrants = .86; *Cronbach's a* for non-immigrants = .86).

Depression

The depression inventory (BDI-Y) screens for symptoms of depression in line with the established criteria of the Diagnostic and Statistical Manual of Mental Health Disorders Fourth Edition [42]. This included bad mood (e.g., "I feel sad"), somatic complaints (e.g., "I have trouble sleeping") and latent suicidal tendencies (e.g., "I wish I were dead"). The inventory showed excellent internal consistency (*Cronbach's a* for immigrants = 0.93; *Cronbach's a* for non-immigrants = .93).

Anxiety

The anxiety inventory (BAI-Y) screens for core symptoms of anxiety disorders relevant to children and adolescents such as general anxiety disorder, panic disorder and social phobia. In line with the Diagnostic and Statistical Manual of Mental Health Disorders Fourth Edition [42], items reflect participants' specific fears including different situations (e.g., "I worry when I am at school"), worried social cognitions (e.g., "I worry people might get mad at me") and physiological symptoms (e.g., "I get shaky"). The inventory showed very good internal consistency (*Cronbach's a* for immigrants = .89; *Cronbach's a* for non-immigrants = .91).

Data Analyses

We performed all analyses using SPSS version 25 [43]. Alpha-error probability was $p < 0.05$ in all analyses. We adjusted for multiple comparisons using the "Multiple Comparisons Calculator" [44] in accordance with the procedure established by Benjamini and Hochberg [45].

Hypotheses 1 and 2

We conducted unpaired *t*-tests to compare symptom levels of depression and anxiety between immigrants and non-immigrants (H1) and calculated the effect size *d* with pooled variances for each comparison [46]. An effect size $d = .20$ indicated a small, $d = .50$ a medium and $d = .80$ a large effect. Moreover, we calculated univariate linear regression models (H2) predicting sum scores of the depression and anxiety scales with self-concept as the primary predictor, gender, age and parental socio-economic status as additional predictors.

Hypotheses 3 and 4

We used *second stage moderated mediation models* [47] to test H3 and H4 as theoretically illustrated in Figure 1A. We performed modelling using PROCESS, third version, a macro for SPSS developed by Hayes [48] that follows a regression-based approach to integrate mediation and moderation in a conditional process analysis [48]. As displayed in Figure 1B, and contrary to the widely used historical method by Baron and Kenny [49], the regression-based approach quantifies the indirect effect between the antecedent X , the mediator M and the consequent Y itself and does not require an association between X and Y as a precondition [48]. The *second stage moderated mediated model* uses bootstrapping ($k= 5000$) to obtain estimates for 95% bias-corrected confidence intervals for the conditional indirect effects in moderated mediation. The indirect effect is calculated for different conditional values of the moderator variable (i.e., age of the participants). Conditional indirect effects are statistically significant when zero is included between the lower and upper bound of the 95% bias-corrected bootstrap confidence intervals generated for different values of the moderator variable W . The bootstrapping method is also superior to the Sobel test [50] due to higher statistical power and independency of the normal distribution of the underlying data [48].

Results

Hypotheses 1 and 2

As expected in H1, immigrant children and adolescents experienced increased symptom levels of depression ($t(1821) = 2.94, p < .01$) and anxiety ($t(1826) = 4.99, p < .001$) but they did not report a lower self-concept compared to non-immigrants. Effect sizes of the inter-group differences were overall small (*Cohen's d* for *BDI* = 0.14; for *BAI* $d = 0.23$; for *BSCI* $d = 0.00$). As expected in H2, the self-concept influenced depressive symptoms in a way that a lower self-concept predicted increased levels of depressive symptoms (Model 1, $F(1; 1814) = 463.53, p = .000$). Consistently, self-concept also predicted increased levels of anxiety in the same direction (Model 2, $F(1; 1820) = 152.96, p = .000$). Details of the univariate regression analyses are presented in Table 3.

Hypotheses 3 and 4, moderated mediation model with outcome depression

We predicted that age would moderate the indirect effect of the migration status on depression via self-concept (see Figure 1A). The migration status did not significantly affect the self-concept ($a = -.011, p = .978$). Thus, self-concept did not represent a mediator for the link between migration status and symptoms of depression ($c' = 1.333, p = .001$). These findings contradicted the expectations of H3. However, the effect of self-concept on symptoms of depression depended on age as evidenced by the statistically significant interaction between M and W ($b_3 = -.137, p = .003$). These findings were in line with H4 as a lower self-concept had a higher impact on increased symptom levels of depression during adolescence. For details on the moderated mediation model predicting symptoms of depression see Table 4.

Hypotheses 3 and 4, moderated mediation model with outcome anxiety

We predicted that age would moderate the indirect impact of migration status on symptoms of anxiety via self-concept (see Figure 1A). Migration status did not significantly affect the self-concept ($a = -.010, p = .979$). Thus, self-concept did not function as a mediator for the statistically significant link between migration status and symptoms of anxiety ($c' = 2.246, p = .000$). These findings contradicted the expectations in H3. However, the effect of self-concept on symptoms of anxiety depended on age, as evidenced by the statistically significant interaction between M and W ($b_3 = -.172, p = .005$). These findings were in line with H4, i.e., a lower self-concept had a higher impact on increased symptom levels of anxiety during adolescence. For details on the moderated mediation model predicting anxiety see Table 5.

Discussion

This study integrated perspectives of developmental science and clinical child psychology to examine the self-concept as an intra-individual contributor to mental health disparities between immigrant and non-immigrant youth throughout childhood development. We could replicate that immigrant youth report more internalizing mental health problems than non-immigrant youth and could also show that self-concept is linked to internalizing mental health problems. However, our analyses did not yield self-concept as a significant mediator for these associations. Despite this null effect we found that age moderated the association between self-concept and internalizing mental health problems. We discuss study evidence along the study hypotheses.

Immigrant children and adolescents experience more internalizing mental health problems than non-immigrants

We hypothesized that having a migration background would lead to increased levels of internalizing mental health problems. Indeed, migration status significantly predicted symptoms of depression as well as anxiety. These findings contribute to the ongoing debate whether the migration status is linked to an increased risk for mental health problems or fosters processes of resilience. Recent evidence on adolescent students in several European and other high-income countries substantiated the “immigrant (health) paradox”, i.e., immigrant youth have a better mental health [51, 52, 53, 54]. Based on a large dataset, our data does not substantiate such findings and links the migration status to a lower mental health. Our evidence, however, is backed by other psychological studies on the mental health gap between immigrant and non-immigrant youth [55, 56]. Possible explanations for these inconsistencies open two pathways. First, while the majority of these studies focus on immigrants from specific origin countries, our sample represents a cross-sectional immigrant population in Germany including a variety of ethno-cultural origins as well as immigrant generations. We have not only addressed first-generation immigrants but also a large sample of second- and several third-generation immigrants. Some previous evidence suggests that the “immigrant health paradox” might encompass first-generation immigrants only [57]. Second, as our data was collected in schools, the identified mental health disparities might reflect consequences of social and ethnocultural discontinuities that immigrant children and adolescents often experience between home and school contexts [25].

Self-concept does not mediate the link between migration status and depression/ anxiety

Our findings show that a lower self-concept in children and adolescents is linked to increased symptom levels of depression and anxiety. The findings are hence in line with our expectations and previous studies on children and adolescents drawn from general populations [22, 23, 24]. Our findings moreover suggest that such associations are generalizable to children and adolescents with diverse immigrant backgrounds.

However, our moderated mediation models fail to substantiate a lower self-concept as a mediator for the link between migration status and internalizing mental health problems. These findings contradict our expectations of a link between migration status and self-concept. At the same time, migration status significantly accounted for higher levels of internalizing mental health problems in our sample (H2). There are two ways to explain these findings. First, more specific dimensions of the self-concept rather than a global, unidimensional construct, are required to explain the link between migration status and internalizing mental health. In school settings, a domain-specific academic self-concept [58] could have provided the overarching and salient cognition for thinking about oneself. However, less salient components of the self-concept, such as self-esteem or emotional stability, could have been less salient for immigrant children and adolescents during study participation – even though such domains may have been more strongly linked to internalizing mental health problems. Second, the self-concept, either in unidimensional or multidimensional operationalization, is not directly associated with the migration status as we hypothesized. Considering the deductions from the coexisting immigrant paradox, immigrant youth could be better off in some health-related psychological outcomes (including the self-concept), while they simultaneously show increased symptom levels on others (including internalizing mental health problems). Subsequent research hence needs to further investigate which within-person processes during childhood and adolescence mediate the link between migration status and internalizing mental health problems. Schunck, Reiss and Razum [59] provided evidence that perceived discrimination negatively influences the mental health disparities between immigrant and non-immigrant adults in Germany. Following up on this track, the potential effects of perceived discrimination on mental health in children and adolescents, especially in school settings, should be examined.

Age moderates the link between self-concept and depression/ anxiety

Consistent with our expectations, we found that adolescents' internalizing mental health problems are more strongly affected by a lower self-concept in our sample. The influence of the self-concept on the participants' mental health status was moderated by age, i.e., a lower self-concept was more harmful for adolescents than for children. Considering age as a proxy for development, our evidence highlights the importance of developmental processes for understanding the relationship between self-concept and mental health. The crucial role of youth development for associations between the self and mental health problems has previously been supported, also for multi-ethnic youth [60, 61]. For young children, the self-concept is less validated by outside cues and tends to be more positive in general [62]. Moreover, Marsh, Parada, Yeung and Healey [63] postulated that younger children defend their self-concept with

“troublemaking behaviour” (i.e., social-directed strategies). While our study focus was on symptoms of depression and anxiety, the specific symptoms of mental health problems with either externalizing or internalizing nuances that are associated with a low self-concept could vary depending on age.

Strengths, limitations and future research

There are several limitations that underline the need for future research on the identification of within-person mediators for the mental health disparities between immigrant and non-immigrant youth. First of all, the sample was collected via self-report measures in school settings. Our findings need replication in more sophisticated designs, e.g., using multi-informant approaches and longitudinal data collection from middle childhood to late adolescence. Second, the self-concept was measured via self-report questionnaires using a unidimensional construct equally applicable to a variety of social settings. The use of multi-faceted measurements, e.g., the “Self Description Questionnaire II” [37], could delineate whether a multidimensional approach to the self-concept leads to differing evidence. Third, the BYI-II subscales were administered to a highly heterogeneous group with immigrant backgrounds. To date, constructs as operationalized in these inventories still have to prove psychometric fidelity and measurement invariance, especially with regard to ethno-cultural backgrounds of respondents. Future studies should additionally consider other mediators, e.g., the children’s or their families’ cultural orientations or perceived discrimination at school. Nonetheless, the present study has several strengths. It combined clinical child psychology and developmental science perspectives as it investigated the impact of the self-concept on symptoms of depression and anxiety from middle childhood to late adolescence. While past research on adolescent mental health has primarily focused on first-generation immigrant populations [7, 16], we also included second- and third-generations from multiple origin countries to acknowledge youth’s diversity in current German society. Regarding the study sample, our evidence is based on a regionally and socio-economically controlled sample across the largest federal state in Germany and data were collected in a variety of different school types.

Clinical implications

Our study findings underline the significance of the self-concept for the mental health of children and adolescents. Health care professionals and school teachers should hence consider the potential of psychological interventions that strengthen a positive self-concept, especially during adolescence [64]. Since our findings are based on a general sample, prevention measures based on the substantiated relationships may also be effective for supporting children and adolescents with lower self-concepts on sub-clinical levels. Correspondingly, Rosseau et al. [65] evaluated a specific prevention program that is based on arts and self-expression to strengthen the self-concept of immigrant and multi-ethnic youth in school settings. Over the course of twelve weeks, children enrolled in this program reported higher levels of well-being in comparison to a control group. Evidence for addressing students at a younger age was provided by De Bettignies and Goldstein [66]: Improvisational theatre classes in elementary schools can improve children’s self-concept and thus prevent internalizing mental health problems.

Conclusions

The proportion of children and adolescents with immigrant backgrounds in Germany has been increasing over recent years. Intersectional practice and research integrating developmental science and clinical child psychology is required to not only consider highly diverse backgrounds among children and adolescents but also needs to acknowledge the fact that those from immigrant backgrounds have increased levels of internalizing mental health problems. While this study substantiated evidence from previous studies on mental health disparities between immigrant and non-immigrant groups in school settings, our data did not substantiate that lower levels of the self-concept mediate these associations. The search for underlying mediators needs to be continued with more specific research designs and focus on other migration-related candidate variables.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the ethical guidelines of the Germany Psychological Society. All participating children and their parents gave written informed consent in accordance with the Declaration of Helsinki. The full study protocol was approved by the Ethics Committee of the Faculty of Psychology at Ruhr-University Bochum (2016-122).

Consent for publication

All authors gave their final approval of the version to be submitted to *Child and Adolescent Psychiatry and Mental Health*.

Availability of data and materials

The dataset collected and analyzed for the current study is available from the corresponding author and GS on reasonable request. Measures used for the primary outcomes can be obtained from the "Pearson Assessment & Information GmbH".

Competing interests

The authors declare that they have no conflict of interest.

Funding

Data collection in this study was financially supported by "Pearson Assessment & Information GmbH". Publication of the study was supported by the DFG Open Access Publication Funds of the Ruhr-University Bochum.

Authors' contributions

Authors' contributions are stated based on the "Contributor Roles Taxonomy" (CRediT) to describe the work that the authoring researchers contributed to the presented scientific scholarly output. JB

contributed to the study by conceptualization, methodology, data interpretation, study coordination and by drafting and revising parts of the article. CC contributed to the study by conceptualization, methodology, data curation, data interpretation and by drafting parts of the article. SS contributed to the study by investigation, conceptualization and providing resources. GS contributed to the study by supervising the research project, funding acquisition, providing resources, revising drafts of the manuscript. All authors provided critical feedback on the manuscript.

Acknowledgements

The investigators gratefully thank research assistants, Eva Krey, Jasmine Golembe and Cordula Behr, for their contributions to the research project, schools and communities who were key to recruitment in this study and, finally, participating children and adolescents for contributing their time and effort to support our research.

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Tables

Table 1. Socio-demographic characteristics of the sample

Variable	Immigrant ($n_1 = 782$)	Non-immigrant ($n_2 = 1057$)
Gender (female, %)	47.4	51.5
Age in months, <i>mean (SD)</i>	14.08 (2.99)	14.03 (3.06)
Parental SES (%)		
<i>Highest (14-19 years)</i>	23.5	30.4
<i>High (12-13 years)</i>	23.1	30.4
<i>Medium (10-11 years)</i>	35.5	34.1
<i>Low (up to 9 years)</i>	17.9	5.1
ISCED School Type (%)		
<i>ISCED-1 (Primary School)</i>	44.04	32.56
<i>ISCED-2 (Lower Secondary)</i>	31.80	19.12
<i>ISCED-3 (Upper Secondary)</i>	24.16	48.32
Migration status, n (%)		
<i>First Generation</i>	130 (16.6)	–
<i>Second Generation</i>	614 (78.5)	–
<i>Third Generation</i>	38 (4.9)	–

Note. Parental socio-economic status (SES), as defined by the highest number of parental years in school and ISCED, International Standard Classification of Education to classify school types [67]

Table 2. Descriptive analysis of the BYHI inventories for symptoms of depression and anxiety by migration status and age

	<i>M</i>	<i>Min</i>	<i>Max</i>	<i>SD</i>	<i>Med</i>
BDI					
Immigrants	29.64	18	80	9.72	27
<i>Children</i>	29.93	18	80	10.56	27
<i>Adolescents</i>	29.40	18	72	8.94	28
Non-Immigrants	28.36	18	80	8.76	26
<i>Children</i>	28.11	19	76	8.51	26
<i>Adolescents</i>	28.55	18	67	8.99	25
BAI					
Immigrants	35.15	19	80	9.47	34
<i>Children</i>	35.75	19	80	10.50	34
<i>Adolescents</i>	34.65	19	60	8.51	34
Non-Immigrants	32.95	18	80	9.18	31
<i>Children</i>	32.59	18	80	9.02	32
<i>Adolescents</i>	33.22	20	76	9.30	31
BSCI					
Immigrants	58.37	22	80	8.63	59
<i>Children</i>	58.56	22	80	9.56	59
<i>Adolescents</i>	58.21	30	79	7.77	59
Non-Immigrants	58.37	29	80	8.8	59
<i>Children</i>	59.28	30	80	9.17	59
<i>Adolescents</i>	57.71	29	80	7.69	58

Note. BYI-II, Beck Youth Inventories (second ed.). *M*, mean scores. *SD*, standard deviation. *Med*, Median. BDI, sum score of the Beck Depression Inventory. BAI, sum score of the Beck Anxiety Inventory. BSCI, sum score of the Beck Self-Concept Inventory. Five-point Likert scale from 1 (“never”) to 5 (“always”). Children are between 7;0 and 13;11 years, adolescents are between 14;0 and 18;2 years of age.

Table 3. Univariate regression analyses for self-concept predicting symptoms of depression and anxiety

Predictor	<i>b</i>	95% <i>CI</i>	β	<i>t</i>	<i>p</i>
Regressing on symptoms of depression					
<i>Intercept</i>	63.29	[59.75, 66.83]	-	35.07	.000**
<i>Age</i>	-.13	[-.25, .00]	-.04	.05	.05
<i>Sex</i>	-2.5	[-3.25, -1.74]	-.14	-6.5	.000**
<i>SES</i>	-.35	[-.73, .03]	-.04	-1.79	.07
<i>Self-concept</i>	-.48	[-.52, -.43]	-.44	-20.82	.000**
<i>Adj. R</i> ² = .21, <i>F</i> (1, 1814) = 463.53**					
Regressing on symptoms of anxiety					
<i>Intercept</i>	58.82	[54.97, 62.67]	-	29.95	.000**
<i>Age</i>	-.131	[-1.14, -.31]	-.042	-1.89	.059
<i>Sex</i>	-3.13	[-3.95, -2.31]	-.17	-7.49	.000**
<i>SES</i>	-.727	[-1.14, -.31]	-.08	-3.42	.001**
<i>Self-Concept</i>	-.28	[-.33, -.23]	-.255	-11.25	.000**
<i>Adj. R</i> ² = .08, <i>F</i> (1, 1820) = 152.96**					

Note. *b*, unstandardized regression coefficient. *CI*, confidence interval for unstandardized regression coefficient *b*. β , standardized beta-coefficient. *t*, t-value. *p*, p-values for t-tests on regression coefficient and intercept. *SES*, parental socio-economic status as defined by parents' highest number of years in school. Adjusted *R*² and *F*-tests for differences to intercept-only models.

p* < .01. *p* < .001.

Table 4. Model coefficients for the moderated mediation model predicting symptoms of depression

	Consequent							
	<i>M (Self-concept)</i>				<i>Y (Depression)</i>			
Antecedent	Path	Coeff.	SE	<i>p</i>	Path	Coeff.	SE	<i>p</i>
<i>X (Migration status)</i>	<i>a</i>	-.011	.403	.978	<i>c'</i>	1.333	.388	.001*
<i>M (Self-concept)</i>	-	-	-	-	<i>b₁</i>	-.433	.031	.000**
<i>W (Age)</i>	-	-	-	-	<i>b₂</i>	7.529	2.678	.005*
<i>M x W</i>	-	-	-	-	<i>b₃</i>	-.137	.045	.003*
<i>Constant</i>	<i>i_M</i>	58.392	.262	.000**	<i>i_Y</i>	53.857	1.865	.000**
Model	<i>Adj. R² = -.001</i>				<i>Adj. R² = .218</i>			
	<i>F(1, 1814) = .001, p = .978</i>				<i>F(4, 1811) = 126.076, p < .001**</i>			

Note. Left column: Path *a* for predictor *X* (migration status) to mediator *M* (self-concept) calculated according to Hayes [48], adjusted *R*² and *F*-test for differences to intercept-only model. Right column: Full model paths (*c'*, *b*₁, *b*₂, *b*₃) in moderated mediation modelling for consequent “symptoms of depression” according to Hayes [48] as illustrated in Figure 1 Panel B), adjusted *R*² and *F*-test for differences to intercept-only model.

M, mediator. *W*, moderator. *M x W*, interaction effect. *SE*, standard error. **p* < .01. ***p* < .001.

Table 5. Model coefficients for the moderated mediation model predicting symptoms of anxiety

	Consequent							
	<i>M (Self-concept)</i>				<i>Y (Anxiety)</i>			
Antecedent	Path	Coeff.	SE	<i>p</i>	Path	Coeff.	SE	<i>p</i>
<i>X (Migration status)</i>	<i>a</i>	-.010	.402	.979	<i>c'</i>	2.246	.423	.000**
<i>M (Self-concept)</i>	–	–	–	–	<i>b</i> ₁	-.228	.034	.000**
<i>W (Age)</i>	–	–	–	–	<i>b</i> ₂	9.627	2.916	.001*
<i>M x W</i>	–	–	–	–	<i>b</i> ₃	-.172	.049	.005*
Constant	<i>i</i> _M	58.377	.262	.000**	<i>i</i> _Y	46.421	2.035	.000**
Model	<i>Adj. R</i> ² = -.001				<i>Adj. R</i> ² = .098			
	<i>F</i> (1, 1820) = .001, <i>p</i> = .979				<i>F</i> (4, 1817) = 49.188, <i>p</i> < .001**			

Note. Left column: Path *a* for predictor *X* (migration status) to mediator *M* (self-concept) calculated according to Hayes [48], adjusted *R*² and *F*-test for differences to intercept-only model. Right column: Full model paths (*c'*, *b*₁, *b*₂, *b*₃) in moderated mediation modelling for consequent “symptoms of anxiety” according to Hayes [48] as illustrated in Figure 1 Panel B), adjusted *R*² and *F*-test for differences to intercept-only model. *M*, mediator. *W*, moderator. *M x W*, interaction effect. *SE*, standard error.

p* < .01. *p* < .001.

Figures

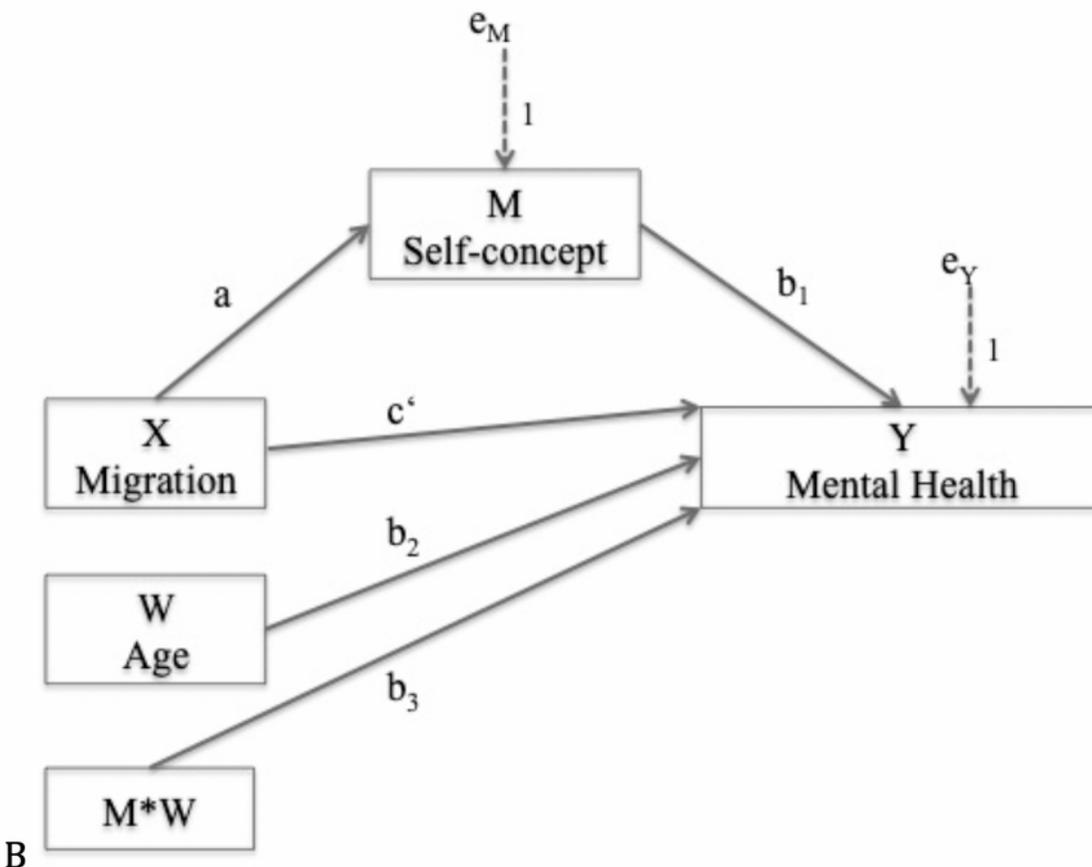
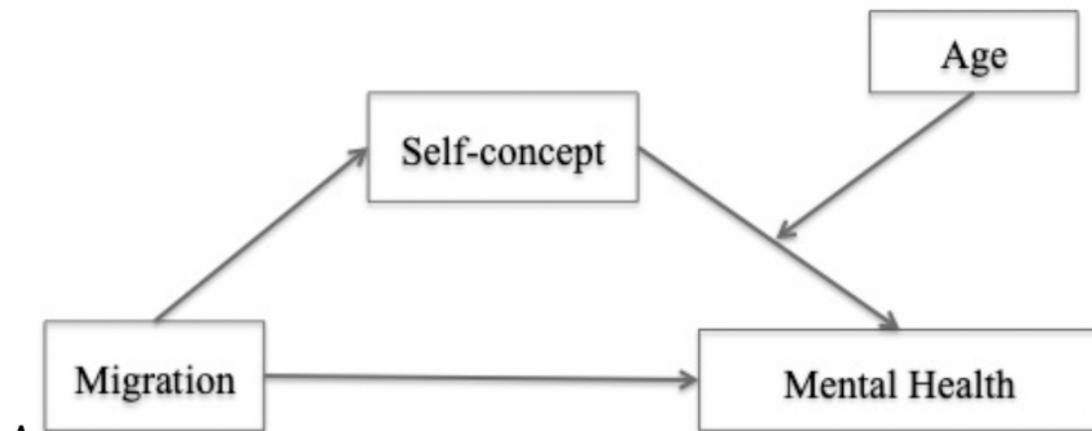


Figure 1

Panel A illustrates the moderated mediation model according to our study hypotheses. We proposed that immigrant children report lower symptoms levels for internalizing mental health problems (H1), self-concept predicts symptom levels (H2), self-concept mediates the link between immigrant status and symptoms levels (H3), age moderates the hypothesized mediation (H4). Panel B illustrates the statistical

realization as suggested by Hayes [48]. Paths of Panel B correspond to the analyses reported in Tables 4 and 5.