

Determinants of mental well-being among Latin American adolescents in Spain

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Abstract: The purpose of this paper is to examine the mental health and well-being of Latin American adolescents in Spain and explore the potential effects of immigration and ethnic concentration. Spain experienced a massive influx of immigrants in the last two decades, yet the data on immigrant adolescents are scarce and no previous research examined the well-being of immigrant adolescents in Spain. Meanwhile, epidemiological research in the United States shows that adolescents of Mexican and Central American origin are generally at higher risk of having mental health problems than other racial/ethnic groups, even after controlling for age, gender and socioeconomic status. We here employ a unique cross-sectional dataset of adolescents in the city of Madrid, Spain that includes an over-sample of immigrant adolescents. Our results indicate that immigrant Latin American adolescents are more likely to be emotionally distressed compared with native-born Spanish adolescents. Age of migration is one of the significant determinants of poor mental health outcomes. The results of this study also indicate a strong association between mental distress and segregation and ethnic concentration, measured by the ethnic origin of friends, classmates and the ethnic composition of neighborhood.

Keywords: immigration, adolescence, mental health, integration, segregation and concentration

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1. Introduction

Since the early 2000s, Spain became one of the main destinations of international migration, and the population of foreign-born residents increased from less than 4% to 14% (Arango, J., 2013). Immigrants in Spain are diverse, including 30% from Latin America or the Caribbean, 20% from Eastern Europe, 20% from E.U. countries, 14% from Morocco and 2% from China. The recent significant increase in immigrants in Spain, and its open and egalitarian immigration policy (Cebolla-Boado and Finotelli, 2014) present a unique case to enable understanding of how immigrant adolescents adjust to their new country. Being a country experiencing immigration relatively recently, research on immigrant adolescents in Spain followed the European trend whereby research exclusively focused on educational outcomes. No previous research examined the mental health and well-being of foreign-born adolescents in Spain. In this paper, we are particularly interested in Latin American immigrants who have advantages for immigration to Spain such as shared language (Spanish) and religion (Catholic) and also have an immigrant preference for receiving Spanish nationality. In this paper, we examine the mental health and well-being of immigrant adolescents in Spain and identify factors that are highly associated with these adolescents' outcomes. Thus, our study can contribute not only to the current public health literature on the mental health and well-being of immigrant adolescents, but also to the sociology of immigration by highlighting the importance of mental health outcomes as a measurement successful integration of immigrant children.

1.1. Mental health and well-being of immigrant adolescents

Research on the effect of immigration on health is challenging because it is difficult to disentangle the effects of the country of origin from destination effects (Kandula et al., 2004). Public health literature in the US revealed that immigrants including Latinos, in general, have better health outcomes than those born natively (Adler et al., 2008; Lara et al., 2005, Bleitch et al. 2012). Immigrants in Europe also appear to enjoy better health status than those born natively (Huijts and Kraaykamp, 2012; Rechel et al. 2011). Yet, other studies documented a higher risk of mental health disorders for immigrants both in Europe and America, including post-traumatic stress disorders, depression and anxiety (Pumariega et al. 2003; Yeh 2005). Language proficiency is known to be a major determinant of well-being among immigrants (Kimbo, Gorman and Schachter 2012), while this study presents a unique case as Latin American immigrants in Spain share the native language (Spanish). In examining the mental

health and well-being of Latin American adolescents in Spain, we will focus on selected key factors that are associated with the process of immigration and integration into Spanish society, which in turn affect the well-being of immigrant adolescents.

1.1.1. Age of immigration

Firstly, the age of immigration is considered as one of the most important predictors of mental health and well-being, and there are two contrasting perspectives. The first perspective states that age of arrival is positively correlated with better mental health outcomes (Alegría, 2007). In this view, arrival after the age of seven decreases the likelihood of mental distress due to perceived discrimination, because the longer immigrant children stayed in their country of origin, the longer they were exposed to family and cultural cohesion and the less intergenerational cultural conflict they faced. Furthermore, children are less likely to be exposed to the emotional disruption and challenges that are associated with integration into a new social environment. The second perspective is that the age of arrival is negatively correlated with better mental health outcomes. Georgiades et al. (2007) argued that children that arriving at a younger age are the ones with better mental health outcomes since they spent their early socialization in their host country, and it is easier for them to adjust to and integrate into the new country. Thirdly, we could formulate a mix of these two hypotheses if the impact of age of immigration on mental health is non-linear. Immigration at early and older ages could contribute to better mental health than immigrating at intermediate ages. The benchmark could be set at the start of compulsory education, when recently arrived immigrant students could face the challenge of adapting to a new setting from the one in which they received their early socialization. Based on these perspectives, we expect the following hypotheses.

Hypothesis 1: The younger a child immigrates to Spain, the better mental health outcome s/he will have.

Hypothesis 2: The older a child immigrates to Spain, the better mental health outcome s/he will have.

Hypothesis 3: The impact of the age of immigration is non-linear, and more distress is experienced among those arriving at intermediary ages (those starting elementary school).

1.1.2. Ethnic concentration in school and neighborhood

The literature on mental well-being of immigrants has focused on the impact of cultural processes that immigrants experience in their path to integration and acculturation, namely, the acquisition of cultural elements of their destination country (Boyce and Fulgini, 2007). Evidence from the US showed that difficulties in the cultural adjustment of Asian minorities increased mental distress, while adolescents who identify themselves with mainstream American culture reported lower levels of mental distress (Yeh, 2003). One way to measure the process of integration is the degree of immigrant concentration in the school and social lives of adolescents. Again, there are two contrasting perspectives. The first view is that residential concentration promotes better mental well-being for adolescents from ethnic minorities, while the opposite appears to be true for native-born or ethnic majority adolescents (Georgiades et al., 2007). This is due to strong ethnic identity and self-esteem, which neutralize the impact of perceived discrimination in causing symptoms of depression, particularly among Latino males (Umaña-Taylor, 2004). Another view is that highly homogeneous ethnic enclaves could hurt the mental health well-being of adolescents if families and peers interpret departures from the shared expectations and norms as cultural betrayal, which results in isolation or alienation (Pumariega et al., 2005: 586). Thus, we have the following hypotheses.

Hypothesis 4: Living in immigrant concentrated social environments is associated with positive mental health outcomes.

Hypothesis 5: Living in immigrant concentrated social environments is associated with negative mental health outcomes.

Additionally, little research exists focused on adolescents' social networks and neighborhood factors, which could identify the mechanisms through which immigrant disadvantages are reproduced in Spain. While ethnic concentration is often measured by the percentage of specific ethnic groups or immigrants in a given neighborhood, De Silva et al. (2005) correctly point out the limitations of such measures. In their view, broad contextual measures of minority concentration do not differentiate whether the individual is actively meaningfully engaged in the community s/he lives in. As a consequence, measures of immigrant/ethnic concentration in schools or neighborhoods do not necessarily reflect the real impact of peers

or interactions with neighbors, rather demographic and socioeconomic characteristics of the neighborhood associated with the concentration (e.g. poverty). The literature on the effect of peer pressure in schools tried to address this problem using instrumental variable models to disentangle these two effects (Evans, Schawb and Oates, 1992, Dietz, 2002, Cebolla Boado, 2007). Furthermore, research on patterns of friendship of minority adolescents is gaining significance. In general, the literature reports high levels of homophily (tendency to form friendship with others who have similar characteristics), particularly among Latino children (Graham et. al., 2009; McGill et al., 2012, Graham et al., 2014). Importantly, McGill et al. (2012) suggest that having intra-racial/ethnic best friends decreases depressive symptoms and improves self-esteem for Black and Asian Americans, while the pattern for Latinos is the opposite. The authors explain this may be due to the fact that Latinos experience less discrimination than other minority groups.

In addition, Graham et al. (2014) suggested that inter-ethnic friendship becomes an important factor in more ethnically mixed environments, and classroom diversity is considered the ideal setting for establishing the positive type of interethnic friendship from which ethnic minority or immigrant adolescents could benefit. Individual willingness is not the only determinant of interethnic friendship. Propinquity (the tendency to form friends with others who share the same characteristics) is also a strong determinant for establishing intergroup friendship. Having friends from diverse origins is also a function of the racial and ethnic composition of schools, because the perception of similarities based on characteristics other than racial/ethnic origin broadens in ethnically mixed schools (Echols and Graham, 2013). According to this perspective, we expect that the effect of ethnic/immigrant concentration will differ depending on the level of ethnic diversity in schools. In other words, showing a strong preference for within ethnic group friendship could be more damaging in settings that are more diverse compared to doing so in more ethnically homogeneous ones, where the pool of friends with whom adolescents could establish interracial friendship is more limited. Furthermore, in more diverse schools, adolescents with strong tendencies to have intra-racial friendships may share certain characteristics that are also associated with mental distress. Alternatively, we expect to find a more moderate effect of intra-ethnic friendship in more ethnically homogeneous ethnic environments.

Hypothesis 6: Having inter-ethnic friendships is associated with better mental health outcomes, and the effect of inter-ethnic friendship varies according to the level of school diversity.

Hypothesis 7: Having inter-ethnic friendship is associated with negative mental health outcomes and the effect of inter-ethnic friendship varies according to the level of school diversity.

2. Data, measures and method

Research on adolescents in Spain, and particularly on the children of immigrant families, has been extremely limited due to the lack of available data. The CHANCES 2011 study addressed these data needs by conducting a survey that contains the largest number of immigrant adolescents in Spain (González Ferrer and Cebolla Boado, 2014). This survey randomly sampled 30 schools (15 public and 15 private) in the municipality of Madrid out of the whole universe of private and public schools in the city. The sample of schools was constructed in two stages. In the first stage, 24 neighborhoods were selected from four different strata constructed by combinations of three indicators: 1) the total number of immigrant-origin children from the 10 largest immigrant groups living in the city in 2011-2012, the percentage of immigrant origin in the neighborhood and 3) the socio-economic profile of the neighborhood according to the official classification provided by the City Statistical Office. The 24 selected neighborhoods included 120 schools with secondary education from which we randomly selected our 30 schools in the second stage. We restrict our analysis to children born in Latin America (n=711) and Spain (n=1,732). We excluded immigrants from other countries due to the small sample size and diversity of the group representing more than 30 countries (n=275).

For independent variables, we coded being Latin-American immigrant if adolescents were born in Latin America and 0 otherwise. We also include the age of immigration when the adolescent came to Spain. For native-born Spanish, this variable obviously clusters in most cases at the age of 0 (80.2%). The measurement of concentration is done using different proxies. The percentage of native-born Spanish classmates is measured by the following five categories: (1) No Spanish classmates (2) Less than 50 % (3) 50% Spanish, (4) 51-74% Spanish-born and (5) 75 % or more. We also consider the composition of the school district

using two continuous variables capturing the percentage of native-born Spanish in the school neighborhood. We also calculated a third variable, which similarly registers the specific ethnic composition of each school in the analysis. Finally, a proxy of intra-ethnic friendship was calculated from the place of birth of the parents of each respondent's best friends. The student questionnaire asked adolescents to report where their three best friends and their best friends' parents were born. Since in some cases, friends could belong to lone parent households, we transformed this variable into a continuous indicator capturing the proportion of Latin American parents among best friends. Accordingly, if for a specific respondent all six parents were born in Latin America, (6/6), our variable gets the value of 1. Similarly, if there is only information about 5 parents who happened to also be Latin Americans, our variable scores the maximum value of 1.

Our models include other controls including sex (1, for females), variables for family structure, which include whether the child lives with her/his two parents (1) or lives with only one parent or other relatives as (0); and parents' marital status coded as being divorced (1) or otherwise (0). The socioeconomic status of parents is modeled using mainly parental education codified in four categories (1 if no education; 2 if completed only elementary education, 3 for completed secondary education and 4 for completed college). We also control for homeownership, a proxy for SES and coded as a dichotomous variable where coded as 1 if the family rents their home or 0 if they own it.

The student questionnaire includes a series of questions reporting symptoms and behaviors related to mental health, including problems concentrating, sleeping and making decisions, the frequency of feeling under pressure and unable to solve problems (Tables A.1 and A.2 in the Appendix provide descriptive information for these variables). An exploratory factor analysis was conducted to compose an index of mental health status from these indicators. Only one of the potential resulting factors provided showed an Eigen-value above the level of 1 (2.04), with all five original indicators contributing to the final factor significantly (see the Table A.3. in the Appendix for the specific factor loadings and uniqueness of the factor). The index is coded with better mental well-being as a positive sign and more mental distress as a negative sign, and it ranges from -2.3 to +2. We use this index as our dependent variable. The resulting index of mental health status has an average value of 0 (sd: 0.86) and is distributed normally (See Figure A.1).

Since our data hierarchically clusters students across schools, the hierarchical linear model (HLM) is appropriate for our empirical analysis. This allows us to disentangle individual variation due to the clustering of individuals in groups, in our case neighborhoods. While the standard one-level regression includes a single residual (ε_i).

$$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$$

HLM adds group level residuals to estimate the impact of clusters. Intercepts in our models are composed of an average estimated value of the dependent variable (γ_{00}) and random corrections that adjust value for each cluster (u_{0j}). These unexplained group effects (consensually referred to as idiosyncratic group effect) could be accounted for using macro-level independent variables and controls (z_j):

$$\beta_{0j} = \gamma_{00} + \gamma_{01} z_j + u_{0j}$$

Thus, our final model specification will be as follows

$$y_{ij} = \gamma_{00} + \gamma_{01} z_j + u_{0j} + \beta_{2j} x_{2ij} + \dots + \Gamma_{ij}$$

where β_{2j} is a fixed effect interpreted as a regular coefficient in a standard regression. Accordingly, x_{ij} is the vector of student and school level fixed effects that will be used to predict differences in the score of immigrants and those natively-born in our dependent variable.

3. Results

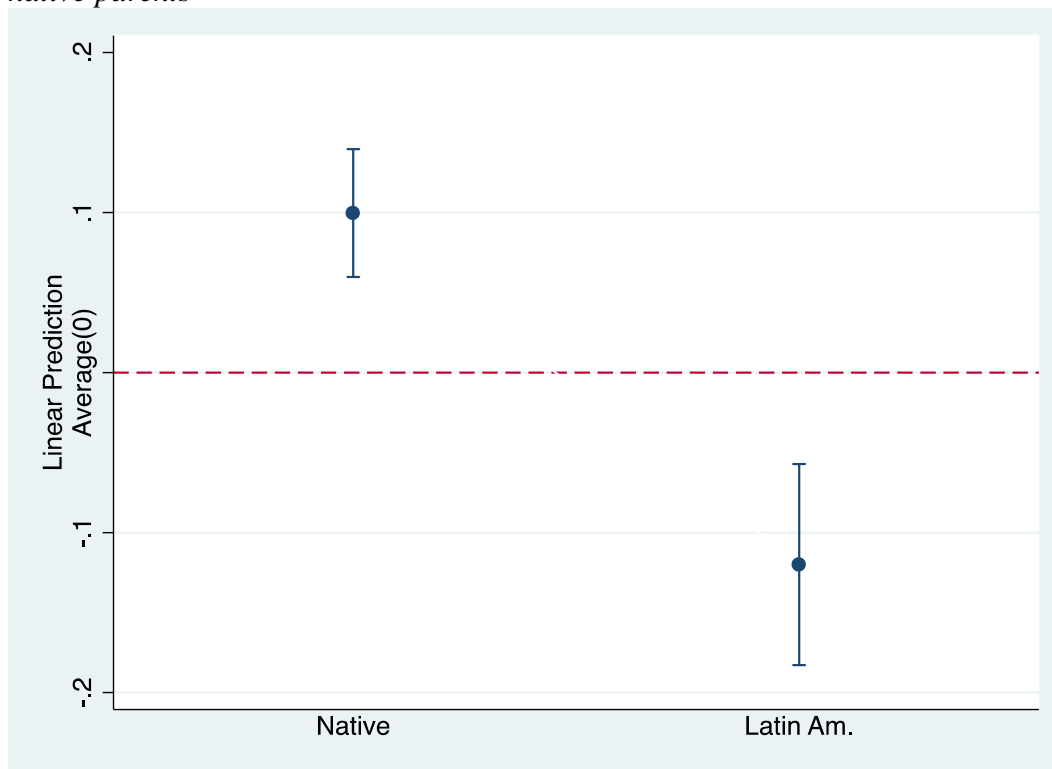
Table 1 shows the characteristics of the CHANCES sample and does so by immigration status. About 29% of our sample are adolescents who were born in Latin America and later immigrated to Spain. The average age of immigration for Latin Americans is 9 years old. The average level of parental education in the entire sample is slightly above the secondary schooling 3.3, both for those natively-born and Latin Americans. Twenty-two percent of the sample has a divorced parent, while this rate is higher for Latin Americans (32%). Latin Americans are more likely to rent a home than native-born Spanish. The average weight of those natively-born in the schools that are included in the sample is 60%. The average percentage of native-born Spanish in the residential district is 73% for the entire sample.

Table 1: CHANCES 2011 Sample Characteristics

	All (N=1,898)		Native-born (n=1296)		Latin Americans (n=602)	
	Mean	SD	Mean	SD	Mean	SD
Well-being	0.018	0.85	0.095	0.85	-0.17	0.82
Female	0.51	0.5	0.5	0.5	0.54	0.5
Age	15	1	15	1	16	1
Parental education	3.3	0.65	3.3	0.65	3.3	0.65
Divorced	0.23	0.42	0.2	0.4	0.32	0.47
Renting	0.3	0.46	0.16	0.37	0.64	0.48
Living together	0.76	0.43	0.8	0.4	0.67	0.47
Age of migration	3.8	5.2	1.5	3.8	9.4	3.6
Native classmates	3.2	0.97	3.4	0.94	2.9	0.96
Unemployment in school district	19	3.4	19	3.4	19	3.5
Native-born in school district	73	6.1	73	6.2	73	6
Latin Americans in school district	17	4.3	17	4.3	17	4.2
Proportion of Latin American parents among three best friends	0.26	0.37	0.088	0.2	0.67	0.36
Proportion of native-born in school	0.6	0.17	0.64	0.17	0.52	0.15

Figure 1 shows average mental well-being index scores by immigration status. Differences in the level of well-being between Latin American and native-born students are visible at the very descriptive level. While the first group averages -0.17 in the final factor (sd: 0.82), this figure grows to 0.06 for those natively-born (sd: 0.86).

Figure 1: Differentials in mental well-being between the children of Latin American and native parents



Estimated from Model 1 in Table 2.

Table 2 shows the results of HLM regression results on immigrant-native born differentials in well-being. The first model quantifies the net impact of being a Latin American conditional on family structure, socioeconomic status (SES) and gender. It can be seen from Model 1 that Latin Americans score -0.22 points on the scale of mental well-being compared with those natively-born. This result is graphically summarized in Figure 1. As expected, females report higher levels of distress.

*Table 2. Hierarchical linear model (random intercept):
The effect of social networks: friends and classmates on mental well-being*

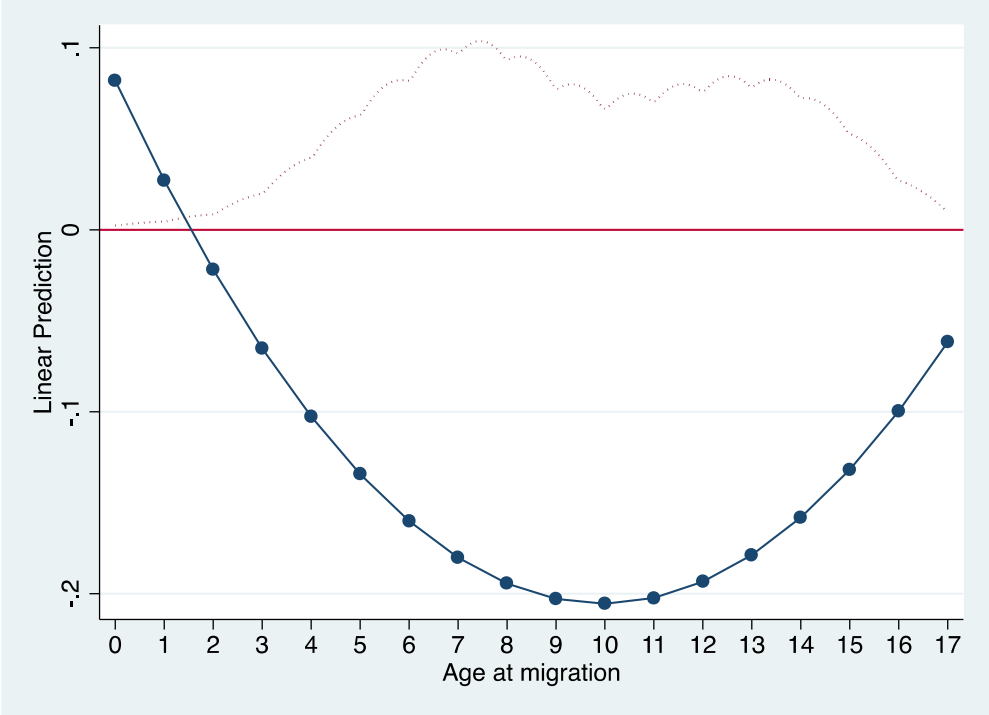
	(3) Base+ Native-born classmates	(4) Base+ Latin American classmates	(5) Base + Neighborhood +predominantly native neighborhoods	(6) Base+ Neighborhood +predominantly Latin-American neighborhood
Latin American	-0.19* (0.05)	-0.10 (0.08)	0.08 (0.19)	0.05 (0.16)
Female	-0.45* (0.04)	-0.44* (0.04)	-0.45* (0.04)	-0.45* (0.04)
Latin Am. Classmates		0.04 (0.02)		
LatinAm*LatinAm classmates		-0.08+ (0.04)		
Native classmates	0.04+ (0.02)			
% unemployment district			0.013+ (0.01)	0.01 (0.01)
% Native-born district			0.010* (0.004)	
LatinAm*%Native- born district			0.011 (0.01)	
% Latin Am. district				-0.010+ (0.01)
LatinAm*%LatinAm in district				-0.015+ (0.01)
Constant	0.49 (0.34)	0.52 (0.34)	0.62+ (0.36)	0.59+ (0.36)
N	1898	1898	1898	1898
N. schools	30	30	30	30
Chi2	231.0	224.0	251.8	248.2

All models controlled for whether father and mother live with the child, whether parents are divorced, students' age, parental education and whether the family owns or rents their main residence. Standard errors in parentheses
+ p<0.10, * p<0.05

Model 2 models the effect of age of migration. Recall that Hypothesis 1 expects a linear positive correlation between the age of arrival and mental well-being, while Hypothesis 2

argues that children that arrived at younger ages should have worse mental health outcomes. In order to test the type of non-linearity proposed by the third hypothesis, the model also includes a quadratic term that will change the slope of the main effect along its range of values. As suggested by H1, the model confirms that the older they were at the time of arrival in Spain, the more mental well-being they report. However, this effect is non-linear. Figure 2 describes the marginal effect of age of arrival considering this non-linearity. As expected, the levels of mental well-being among Latin American-born students arriving at younger ages (before the age of 6/7) is better than those arriving between the ages of 8 and 12. Adolescents arriving in Spain after age 12 again report an improvement in their mental wellbeing. The figure also plots the distribution of age of arrival (dashed line), which suggests that predictions are more reliable in the range of ages 4 to 16 (very few respondents arrived before the age of 3).

Figure 2: Hierarchical linear model (random intercept):
 The effect of Latin-American immigrant: friends and classmates on mental wellbeing

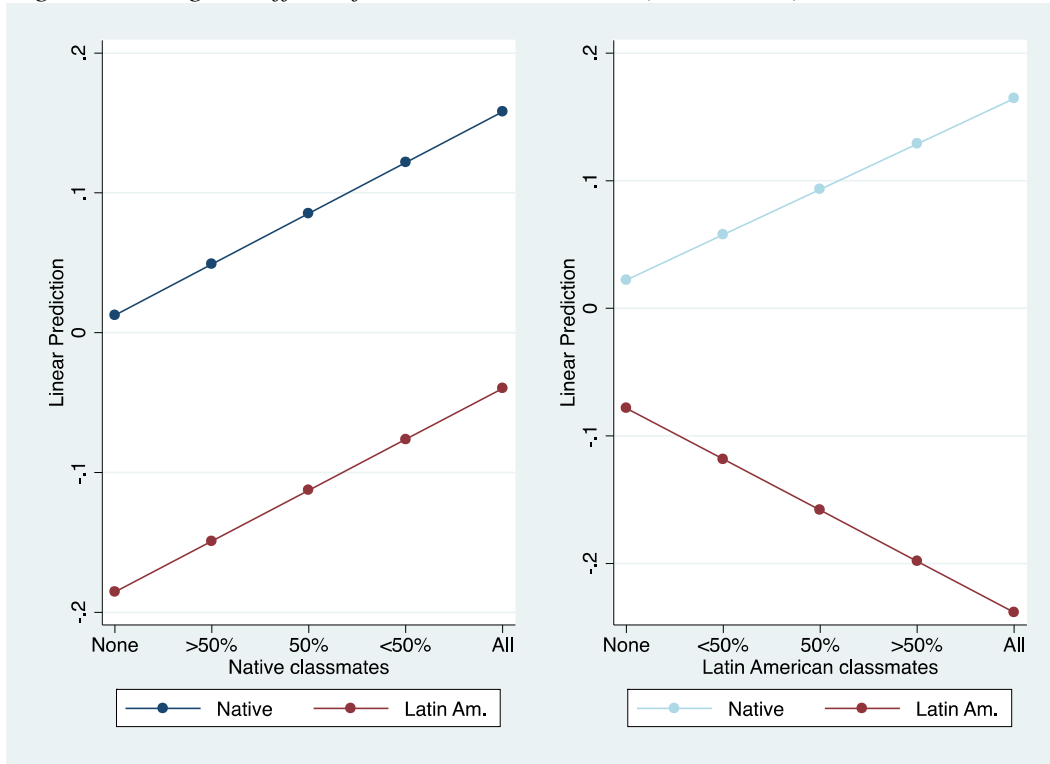


Estimated from Model 2 in Table 1. The dashed line represents the distribution of cases.

Models in Table 3 explore the effect of ethnic concentration on mental distress. Models 3 and 4 include variables that measure the percentages of native-born and Latin-American classmates. These two variables are more limited than the indicators of intra-ethnic friendship since it is a self-report of adolescents; therefore it is not an objective measure. The answers to these questions range from 1 (none) to 5 (all). The impact of attending a class with more

native-born classmates is positive, which means that it increases mental well-being. Since no interaction is significant between this variable and the Latin American dummy, one can assume that this positive effect on mental well-being is equal for those natively-born and immigrants, as noted in the left panel in Figure 3. On the contrary, attending a class with more Latin American classmates is associated with poorer mental health. The two-way interaction is significant and negatively associated with mental well-being, as reflected in the right panel of Figure 3. No significant effect is found for the natively-born.

Figure 3. Marginal effect of ethnic concentration (classmates) on the mental well-being

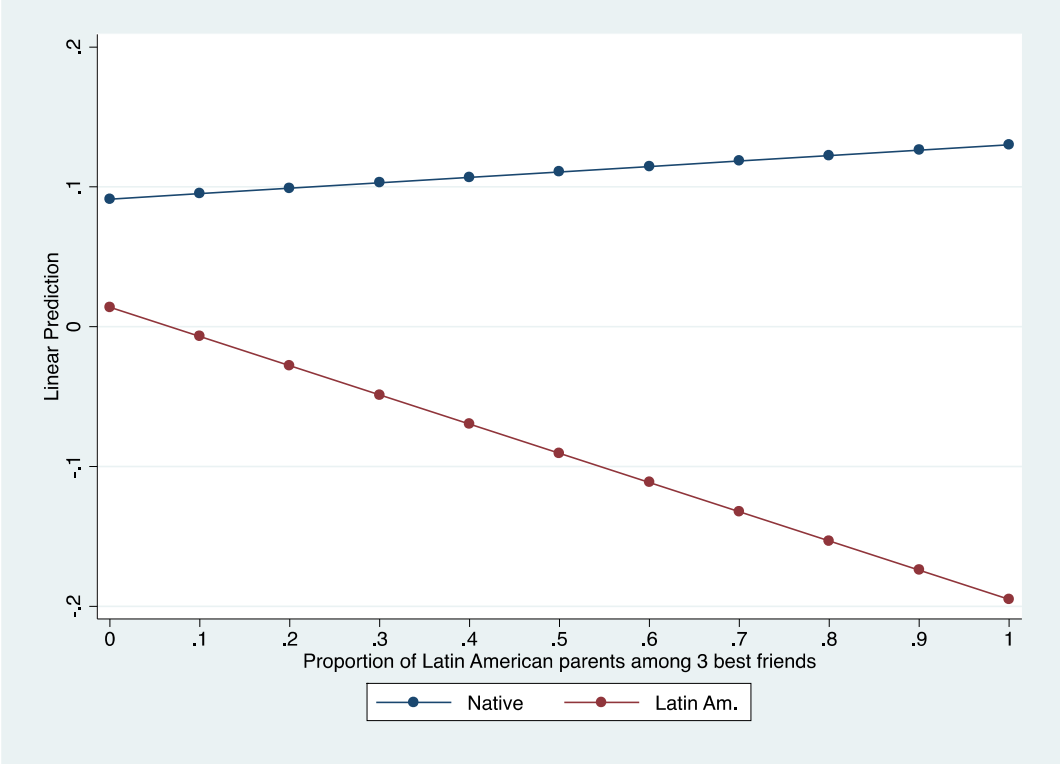


Estimated from models 3 and 4 in table 3.

Finally, Models 5 and 6 contrast the effect of the concentration hypotheses using the broader contextual indicators available: the percentages of natively-born (Model 5) and Latin Americans (6) in the school district. Interestingly, the pattern confirms the results obtained from previous models in which concentration was modeled using intragroup friendship and the composition of classrooms. The better the natively-born are represented in the school district, the lower the level of mental distress of both natively-born and Latin America-born students. Yet, note that this effect is only significant for the native-born (for the Latin Americans, the interaction is close to the accepted level of statistical significance). By contrast, concentration of Latin Americans is associated with higher levels of mental distress

for both groups, and this time, both effects are statistically significant. A summary of the marginal effects is provided in Figure 4.

Figure 4. Effect of the ethnic composition of friendship for Latin Americans and Spanish



Estimated from Model A.1. shown in table A.3

All these results represent a consistent confirmation of Hypothesis 4, namely that co-ethnic concentration and segregation increases the mental distress of Latin Americans in our sample. The final set of hypotheses (6 and 7) sought to re-interpret this finding taking into account the level of ethnic concentration in school and neighborhood mediating the impact of inter or intra-ethnic group friendships on mental distress (propinquity). Modeling the effect of propinquity requires introducing three-way interactions between the pattern of friendship, immigrant (Latin American) status and ethnic/immigrant concentration or school diversity. Unfortunately, Chances 2011 does not include objective measures of immigrant or ethnic composition of schools. Instead, we created two variables based on the proportion of immigrants and Latin Americans in each school from the observed samples. The interpretation of models with these complex interactions is far from intuitive since one has to jointly take into account the effect of all additive and interactive terms (Table A.3, Model A.1 for native friends in the appendix). The results only partially confirm the propinquity hypothesis. Having more native-born friends is more positive for Latin American students in

environments where native-born Spanish dominate. In other words, the positive impact of having Spanish friends does not apply to contexts where there are few Spaniards. This helps to explain why concentration of minorities could put students at risk of mental distress. Not having contact with native-born students is negative, particularly when immigrant adolescents are in ethnically concentrated environments. So as to ease the interpretation of this result, we present Figure 6 plotting the effect of patterns of friendship with native-born Spanish in different school settings (according to their level of diversity) for Latin American students.

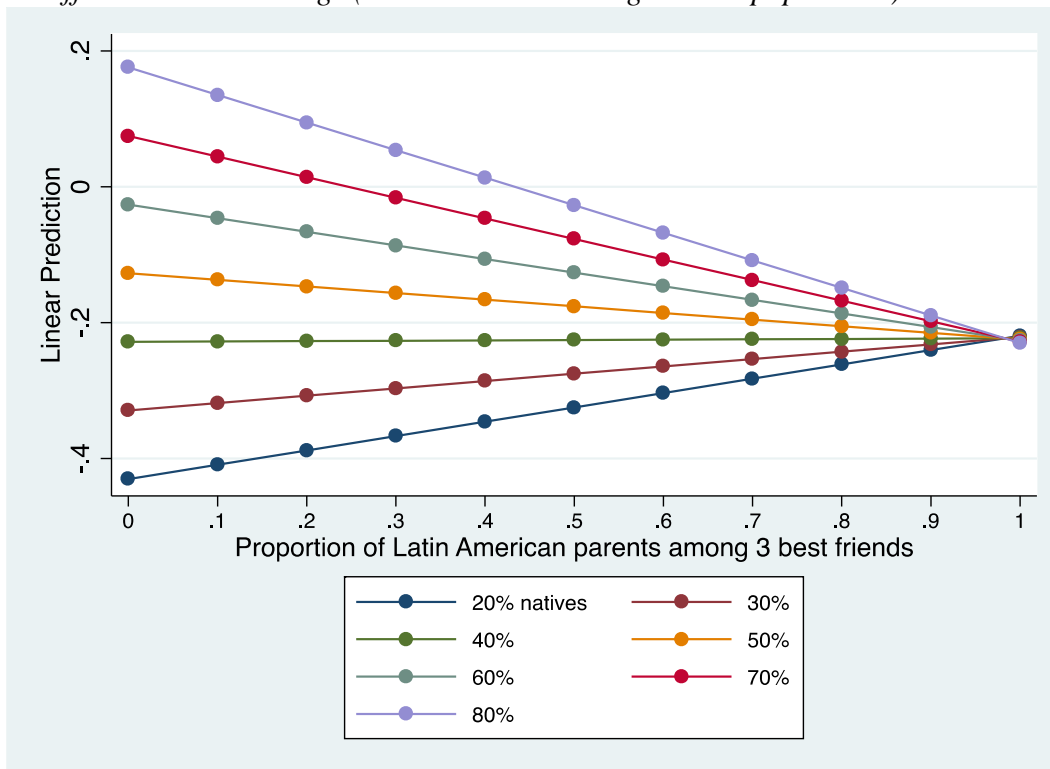
One can here see the effect of having friends with more native-born Spanish parents for Latin American students in different school settings (ranging from schools where native-born are only 20% of the student body, to schools where they represent 80%). The positive effect of having more native-Spanish friends is stronger in schools where immigrant adolescents are concentrated. On the contrary, having more Spanish friends while attending a school which is predominantly native-born Spanish, makes no difference in terms of mental health for Latin American adolescents. This should be interpreted as a sign that the likelihood of creating intergroup friendship is a moderator of how beneficial it is for minority/immigrant adolescents to engage in friendship with native-born Spanish students.

The test of our final set of hypotheses requires a complex modeling strategy. While intra-ethnic friendship could have an effect independent of the school or neighborhood contexts, the theory of propinquity suggests that establishing a clear pattern of ethnic friendship could have a different significance depending on how likely it is that inter-ethnic friendship is formed. Contrasting this argument implies a three-way interaction between the origin of friends, the respondent and the ethnic composition of the school environment. The interpretation of models including this type of relation between independent variables is far from being intuitive. We here include a graphic summary of the results obtained from a model in the Appendix (Model A.1. in Table A.3).

Figure 4 confirms that intra-ethnic friendship is on average associated with deteriorating mental well-being for Latin American adolescents. Yet, Figure 5 proves that this is not always the case, since it is restricted to more mixed ethnic environments. In other words, as Figure 6 shows, the negative impact of having Latin American friends for Latin-American adolescents only exists in the schools where the natively-born represent more than 60% of the student body. In a nutshell, intra-ethnic friendship should only be considered a negative determinant

of mental health well-being when the possibility of establishing cross-ethnic friendship is easier.

Figure 5. *Propinquity: impact of having native friends (based on parents' immigration status in different school settings (% native-born among student population))*



Estimated from Model A.1 in Table A.3

4. Discussion

The evidence provided in this paper confirms the findings of research in the US on the poor mental health and well-being of Latin American immigrant adolescents. Despite the advantage of shared language and religion and a more open immigration policy, Latin American adolescents are experiencing mental health distress in Spain. Several of our conclusions could aid understanding of the factors that determine the integration outcomes of the children of immigrant parents and immigrant children. Children arriving at younger ages (before the start of compulsory education) present better mental well-being than those arriving after the age of 13. By contrast, students arriving during primary school (7-12 years) appear to report higher levels of mental distress. This may be due to the fact that as a recent immigrant host country, Spain may require immigrants to take a more traditional assimilation pattern to integration into society. That was the case in the earlier immigration to the United States

where the “melting pot” approach was the dominant method of integration of immigrants into American society. In this sense, migrating at an earlier age helps adolescents to better integrate into Spanish society without much stress.

Ethnic concentration and segregation have also been identified as robust and significant determinants of the mental well-being of adolescents in Spain. Having contact with more native-born Spanish (friends or classmates) appears to be positive for both Spanish and Latin American adolescents. On the contrary, when Latin Americans cluster and show stronger tendencies for intra-ethnic group friendship their mental well-being appears to be worse. This trend is particularly true when attending more ethnically concentrated schools. Broader indicators of concentration/segregation (attending schools in more ethnically mixed neighborhoods) also concur with these findings.

The identification of the specific mechanisms that are responsible for these findings is a complex task. On the one hand, concentration and segregation could be significant causes of mental distress if students feel isolated from mainstream society. On the other hand, immigrants living in more segregated environments may share characteristics that could harm mental well-being of adolescents (e.g. lower SES). One of the limitations of our study is that our measure of mental health and well-being is not a standardized measure of mental health, it corresponds to widely used symptoms and signals of mental distress associated with mental health outcomes. Future studies should employ longitudinal data to observe the changes in mental health outcomes over time among students in different settings (and ideally, to compare the impact of moving out of initial schools) using standardized mental health measures. Even though interpretation of our findings may be limited, future research on the determinants of the mental health of immigrant children could contribute to our understanding of the general processes that could produce immigrant/native gaps.

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Appendix

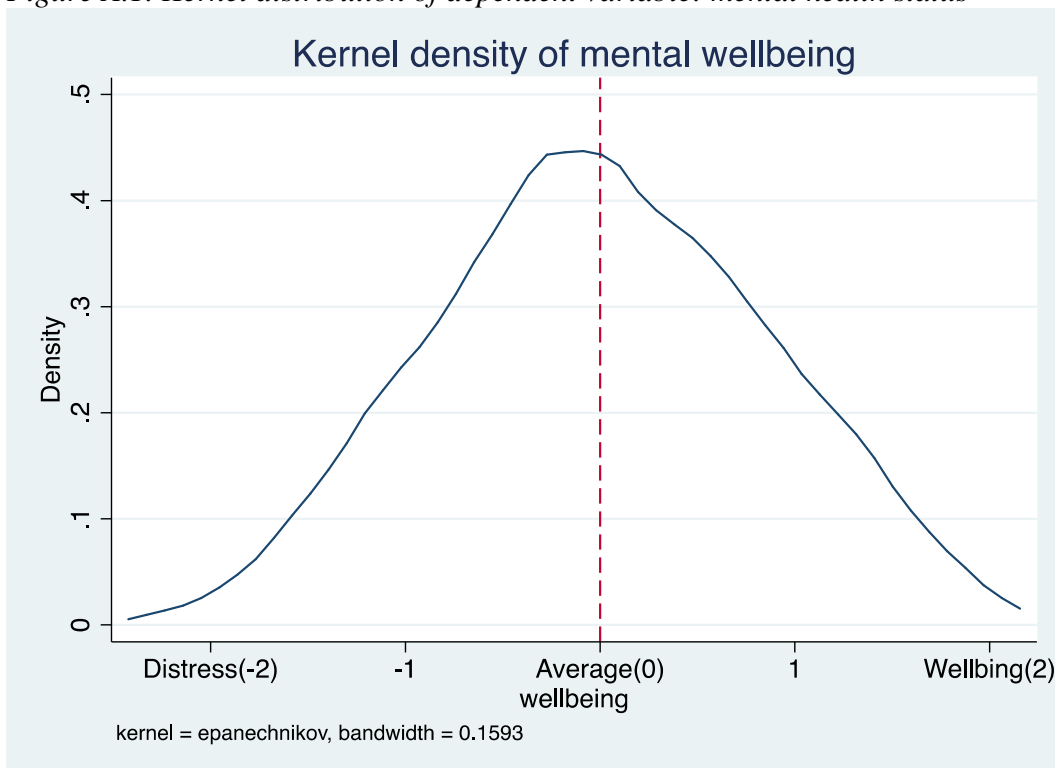
Table A.1. Distribution of measures for mental health well-being

	n	Mean	Std. Dev.	Min	Max
Problems to concentrate	2703	5.324084	2.433885	0	10
Problems to sleep	2704	3.319527	2.825936	0	10
Problems to make decisions	2694	4.725316	2.591994	0	10
Frequency of feeling under pressure	2690	5.113011	2.584219	0	10
Frequency of feeling unable to solve problems	2689	4.413537	2.811551	0	10

Table A.2. Factor loadings for dependent variable.

	Final factor	Uniqueness
Problems to concentrate	0.5169	0.7298
Problems to sleep	0.5050	0.7384
Problems to make decisions	0.7302	0.4666
Frequency of feeling under pressure	0.7071	0.4995
Frequency of feeling unable to solve problems	0.6986	0.5084

*Figure A.1. Kernel distribution of dependent variable: mental health status**



See Figure A.1. in the Appendix for more detailed information about this distribution.

Figure A.2. School level standard deviations in answers given to the estimation of native and Latin American respondents to the student questionnaire.

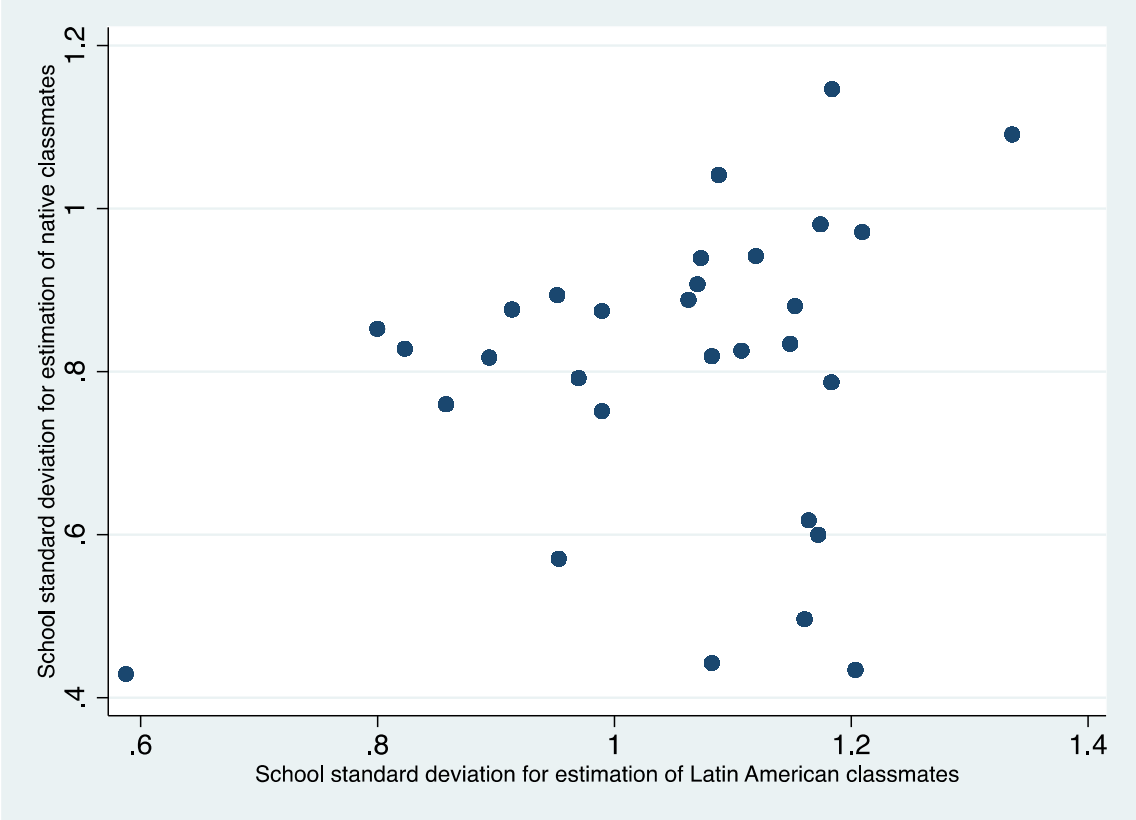


Table A.3: HLM results for mental well-being: Interactions between friends and ethnic composition of the school district.

	(A.1)
Latin American	-0.60* (0.28)
Latin American parents among friends	-0.49 (0.44)
LatinAmerican*Latin American parents among friends	0.90 + (0.56)
% of native-born in school	0.16 (0.15)
Latin American*% of native-born in school	0.85+ (0.48)
Latin American parents among friends*% of native-born in school	0.87 (0.74)
Latin American*Latin American parents among friends*% of native-born in school	-1.89* (0.96)
Female	-0.43* (0.038)
Age	-0.033+ (0.019)
Parental educ.	0.081* (0.030)
Parents divorced	-0.12 (0.076)
Renting house	0.026 (0.054)
Parents live with child	0.045 (0.076)
Constant	0.43 (0.36)
N	1790
N. of schools	30
Chi2	228.5***

Standard errors in parentheses + p<0.10, * p<0.05