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Live together: does culture matter?

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Abstract

This paper studies the role of culture in determining the decision to live together (as a married or unmarried couple). To examine this issue, we utilize data on first-generation immigrants who arrived in the United States at or before the age of 5. We follow the epidemiological approach, indicating that dissimilarities in the behavior of young-arrival immigrants originating from different countries, who grew up and live in the same country, can be interpreted as evidence of the existence of a cultural effect. Results show a positive and statistically significant relationship between the cultural proxy, that is, the proportion of individuals living together by country of origin, and the immigrant choice of living with a partner. We extend this analysis to an exploration of the formation of same- or different-origin couples, in addition to an examination of the effect of culture on other modes of household arrangement (such as living with an adult child, living with grandparents, same-gender couples, and family size, among others). In all cases, our findings suggest an important role of culture. The results are robust after controlling for several home-country, observable and unobservable characteristics, and to the use of different subsamples. Supplementary analysis shows a range of channels of transmission of culture.

Keywords Culture · Immigrants · Live together · Marriage · Cohabitation

JEL codes J12 · J15 · Z13

1 Introduction

Despite substantial differences across countries, living with a partner (especially married, or as an unmarried couple) still appears to be the preferred state for individuals in modern society, even with the current high divorce rates, and with the changing household roles as a consequence of the increase in women's wages and

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labor force participation (Browning et al. 2014). Why do individuals marry, or live together as married? From an economic point of view, both married and unmarried couples living together are modes of partnership that can have the goal of joint production and joint consumption in order to maximize the welfare of the individuals involved. Becker (1973) was one of the first researchers to focus on the gains of marriage versus remaining single. Following his work, an extensive body of theoretical and empirical literature explores the phenomenon from other perspectives, especially considering intra-household bargaining (Andaluz et al. 2017; Chiappori et al. 2002; Grossbard-Shechtman 1993; Lundberg and Pollak 1996). Very recently, Browning et al. (2014) review in detail the reasons why "*two are better than one*", which include the sharing of public goods, the division of labor to exploit comparative advantage and increasing returns to scale, extending credit and coordination of investment activities, risk pooling, and coordinating child care. There are other factors to be found in the literature, such as the improvement in the health status of the individuals living together as married or unmarried couples (Perelli-Harris et al. 2017; Waite 1995), the impact on health-care (Marcén and Molina 2012; Pylypchuk and Kirby 2017; Simeonova 2013), and the benefits of children living with their parents versus those living with a single mother, in terms, for example, of poverty and education (Mencarini et al. 2017; Waite 1995).

The exploration of the determinants of the living-together decision has not lost its importance in the literature. Stevenson and Wolfers (2007) review the changes and the driving forces of marriage, divorce, and cohabitation, suggesting that the characteristics of individuals, such as their race, gender, and their educational level, appear to be related to the choice of marital status, in addition to outside-of-marriage options, social norms/culture, and legal factors that can affect the bargaining power in determining household arrangements (Angrist 2002; Browning et al. 2014; Chiappori et al. 2002; Grossbard-Shechtman 1993; Negrusa and Oreffice 2010). Economic conditions (Ahituv and Lerman 2011; Bellido and Marcén 2018; González-Val and Marcén 2017, 2018), family laws (González-Val and Marcén 2012a, 2012b, 2017; Bellido and Marcén 2018; Stevenson and Wolfers 2007), parenthood (Bellido et al. 2016; Steele et al. 2005) and welfare reforms (Bitler et al. 2004) all appear to affect the transitions into and out of marriage. We add to this literature by exploring empirically whether culture is a factor in the decision to live together (as a married or unmarried couple).

The importance of culture is a pertinent question for many researchers, but it is not easy to measure. Culture is normally defined as a set of beliefs and preferences that varies across space, time, and social groups (Fernández 2007). Similarly, culture is described by UNESCO (2001) as *the set of distinctive spiritual, material, intellectual and emotional features of society or a social group. Not only does this encompass art and literature, but it also includes lifestyles, ways of living together, value systems, traditions, and beliefs*. This definition is interesting for our work, since it suggests that ways of living are part of the culture or social norms of a society. Individuals form their own attitudes based on what their parents instill in them, but their preferences and beliefs may be influenced by the role models within their communities (Furtado et al. 2013). Those who remain without a partner as single or divorced can be ostracized in some countries, because that life-style is different from the one(s) established by the prevailing social norms (Furtado et al. 2013; Kalmijn and Groenou

2005; Kalmijn and Uunk 2007). Then, it is not beyond the bounds of possibility that, if an individual does not want to be ostracized, they will follow the social norms (or culture) and will decide to live with a partner, pointing to the culture as a potential factor in the way-of-life decision. Additionally, social norms may affect the way in which individuals search for a matching partner. In a theoretical framework, Ishida (2003) suggests that social norms may force individuals to commit more cost to the search process. Culture can also be important in the intra-household bargaining in labor and leisure supply (Datta Gupta and Stratton 2010; Oreffice 2014).

To analyze the cultural effect on the decision to live together (as married or unmarried couples), we follow the epidemiological approach (Fernández 2007) by exploring the behavior of immigrants who arrived in the US at or before the age of 5, and whose ethnicity or country of origin is known. In order to capture the effect of culture, we exploit the variation in the proportion of individuals living with a partner (as married or unmarried couples) by country of origin. As the epidemiological approach establishes, since immigrant attitudes are probably similar to the pre-ferences and beliefs of their parents, forbears, and ethnic communities, differences in the proportion of individuals living with a partner (married or unmarried) by home country can be interpreted as evidence of the existence of a cultural effect.

Our work contributes to the literature on the effect of culture on socio-economic and demographic variables, which is becoming more and more common (Fernández 2011; Giuliano 2016). Related to our research are those studies that examine the impact of culture on living arrangements (Giuliano 2007), and divorce (Furtado et al. 2013). Giuliano (2007) finds that individuals originating from countries whose counterparts leave the nest later in life are more likely to delay the decision to live without their parents. Furtado et al. (2013) show a positive relationship between the home-country divorce rates and the probability that the immigrants from those countries report being divorced. Utilizing methodologies quite analogous to ours, there are several papers showing the role of culture in women's labor force parti-cipation and fertility (Bellido et al. 2016; Contreras and Plaza 2010; Fernández 2007; Fernández and Fogli 2006; Fernández and Fogli 2009; Marcén et al. 2018), self-employment (Marcén 2014), the search for a job (Eugster et al. 2016), and even on the math gender gap (Nollenberger et al. 2016).

Our sample is obtained from the 2015 American Community Survey (ACS) of the Integrated Public Use Microdata Series (IPUMS) (Ruggles et al. 2017). The cultural proxy is calculated by utilizing data from the Integrated Public Use Microdata Series International (IPUMS International), Minnesota Population Center (2017), which allows us to measure the variable of interest more precisely by age and education, as in Marcén et al. (2018). Results point to culture as an important factor in the living-together decision. This is maintained after adding controls for unobservable char-acteristics (including country of origin fixed effects and year of immigration fixed effects), and carrying out several robustness checks.

Since we only consider the ethnic origin of heads of household in the main sample, we have re-examined the effect of culture, taking into account the fact that individuals can live together with a partner of the same or different country of origin.[1] It is worth noting that a separate gender analysis has been considered

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[1] In this analysis, the US native partners have also been considered.

including heads and non-heads of household, to mitigate the concerns that the use of a sample of heads of household, who have traditionally been men (Hobbs and Stoops 2002), may generate. Our findings do not vary.

In our main analysis, living together includes both married and unmarried couples. However, there are other modes of household arrangements in which culture may play a role. Furtado et al. (2013) point to the existence of a divorce culture. Here, we show evidence in favor of a living-together culture jointly for married and unmarried couples, but also when we separate those kinds of couples. This finding should reduce the potential concerns that social norms regarding marriage can differ from those of unmarried cohabitation, which can generate doubts as to whether we are capturing the social norms affecting marriage decisions or those affecting unmarried cohabitation. With respect to other household arrangements of individuals living together, culture appears to be a determinant of the decision to live with an adult child or with a grandparent, of the choice of same-gender couples, of the family size, of the age differences between the members of the couple, and of the decision to remain single.

We cannot study whether culture is transmitted vertically, that is, from parents to their children, since there is no data on parents' characteristics, but we can examine whether an increase in the concentration of individuals of the same country of origin has an effect on the number of individuals who choose to live with a partner. As Furtado et al. (2013) and Marcén et al. (2018) show, that relationship may reflect the sensitivity of immigrants to the community in which they live, providing empirical evidence of a possible horizontal transmission of culture. Following the same strategy, we also study whether immigrants respond to the concentration of elderly individuals of the same ethnicity which can be considered as a channel of how culture operates. Similarly, the possible impact on our analysis of the US cultural-assimilation process is included in our study. Differences in the way a culture can be classified (individualism, or collectivism) and in gender roles, measured through the native language of the immigrants, are added to the work as potential determinants of how culture operates. Our findings reinforce the idea that culture is important in the decision to live with a partner.

The remainder of the paper is organized as follows. Section 2 presents the empirical strategy. Section 3 describes the data. Baseline results and robustness checks are discussed in Section 4. Finally, Section 5 sets out our main conclusions.

2 Empirical strategy

Measuring culture can be tricky, because of the interrelations among economic conditions, institutions, and social norms (Fernández 2007; Sevilla 2010), but Fernández (2007) proposes an empirical strategy to disentangle the effect of culture from that of markets and institutions, maintaining that the epidemiological approach is a useful instrument in determining whether culture is an important factor in human behavior. Following that approach, we use data on immigrants who arrived in the US as children, and whose country of origin or ethnicity is known. Those immigrant children have all grown up in the same country, so that, if only institutions and markets are important to the decision to live together, the home-country proportion of

their counterparts living together (as married or unmarried couples) should have no impact on the decisions of those now residing in the US. On the other hand, if culture does play a role in the decision to live together, as married or unmarried couple, we would expect to detect a relationship between the behavior of the immigrants living in the US and that of their counterparts in their countries of origin. To test this issue, we estimate the following equation:[2]

$$Y_{ijtk} = \beta_0 + \beta_1 HCLT_j + X_{ijkt}\beta_2 + \delta_k + \eta_j + \theta_t + \varepsilon_{ijkt} \qquad (1)$$

where Y_{ijk} is a dummy variable that takes value 1 when immigrant i of cultural origin j and year of arrival to the US t reports living together (as married or unmarried couple) in state k, and 0 otherwise.[3] Our measure of culture, $HCLT_j$, is the proportion of individuals of country of origin j living with their partners. We revisit the definition of the cultural proxy below. In any case, if culture plays a role here, immigrants from countries whose counterparts tend to choose to live together as married or unmarried couples in a high proportion, should maintain similar behavior in the US. Then, β_1 should be positive. This is based on the notion that immigrants form their own attitudes based on perceptions of role models within their ethnic communities (Furtado et al. 2013), as well as through family socialization (Bisin and Verdier 2000; Bisin et al. 2004). Parents may instill in their children beliefs and preferences about the predominant or customary way of living in their home countries. The vector X_{ijkt} includes individual characteristics, such as gender, race, age, and education level. As Stevenson and Wolfers (2007) show, racial differences in marital status do exist (see, also, Brien 1997). Blacks normally enter into marriage later in life and even, sometimes, never marry. Since our sample includes individuals of different races, the coefficient picking up the impact of culture could be capturing racial differences, in addition to, or rather than, a cultural effect. To address this issue, we have incorporated three dummies to control for the race of the individuals (White, Black, and Asian).[4] The inclusion of gender is also necessary because we select those first-generation immigrants who are heads of household and, as the literature suggests, women who are more financially independent are more likely to divorce (Jalovaara 2003; Weiss and Willis 1997) and women who divorce are less likely to remarry (Buckle et al. 1996; Gierveld 2004).[5] Other research indicates that the age of the individuals and their level of education can have an effect on marital status, for reasons independent of culture (Goldstein and Kenney 2001; Stevenson and Wolfers 2007). As before, these factors must be incorporated in our specifications. Controls for unobserved characteristics of the areas where our first-generation

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[2] As in Furtado et al. (2013), we use a linear probability model for simplicity. Our conclusions are maintained when applying a probit model; see Table 9 in the Appendix.

[3] We have repeated the whole analysis with/without those individuals reporting being married with their partner absent. Our results do not vary. All our robustness checks are available upon request.

[4] The omitted race is *other races*. Those with more than one race have been eliminated from the analysis. The entire analysis has been re-estimated with/without race controls and results do not vary. We have also considered a sample of White individuals and our findings are unchanged, reinforcing that it is the cultural effect that we are observing. Our sample has been extended to incorporate those who report mixed race and results are similar, see Table 10 in the Appendix.

[5] The IPUMS USA and the IPUMS International define the head of household as any household member in whose name the property is owned or rented. We revisit the choice of the head of household below.

immigrants live are added by using state fixed effects, denoted by δ_k, for the country of origin unobserved characteristics, by introducing country of origin fixed effects, η_j, and for the time-varying unobserved characteristics by adding year of immigration fixed effects, θ_t. [6] Standard errors are clustered at the home country level, in order to account for any within-ethnicity correlation in the error terms. [7]

We have extended our work by using alternative methodologies in order to explore the choice of living with a partner of the same ethnicity, or not. This is explained in detail in Section 4. The analysis of how culture operates over time, and the possible mechanisms of transmission, are presented in Section 4.5.

3 Data

In our main analysis, we use data from the 2015 American Community Survey (ACS) of the Integrated Public Use Microdata Sample (IPUMS) (Ruggles et al. 2017). [8] Our sample consists of first-generation immigrants, who arrived in the US when they were 5 years old or younger and whose country of origin is reported. [9] These children all grew up under US laws, institutions, and markets, but their attitudes are likely to reflect the attitudes of their parents and ethnic communities. We include individuals aged 18 to 50 because everyone in this sample can legally live with a partner. The 2015 ACS data allows us to identify unmarried couples, legally-married couples, and those not living with a partner. [10] In the main sample, we select those immigrants who are heads of household, or householders, in order to have just one observation per household. [11] Our main sample contains 7052 observations of

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[6] The inclusion of the country of origin fixed effects is not possible in all specifications (see below). We have re-run the analysis replacing the state fixed effects with Metropolitan Statistical Areas (MSA) fixed effects, and we do not find substantial differences. Results do not change when including/excluding the country of origin fixed effects and the year of immigration fixed effects. In the same vein, our findings are invariant after the inclusion of interactions between the time-varying fixed effects and the country of origin fixed effects (see next section).

[7] All estimates have been repeated with/without weights and with/without clusters and we find no differences.

[8] With this dataset, we have enough observations for 38 countries of origin, which allows us to obtain reliable results with all our sample selection requirements.

[9] Countries of origin with less than 20 observations per country have been removed from our analysis, following the example of the existing literature, since with only a few observations it is difficult to assume that the immigrants represent the population composition of their country of origin. It is also worth noting that the analysis has been repeated by selecting a sample of immigrants who arrived in the US under age 8 and results are similar (see Table 10 in the Appendix).

[10] We only include heterosexual couples since same-gender couples were not allowed to marry in all countries during the period considered. There are only 84 heads of household who can be classified as having a same-gender partner.

[11] Among those household-head first-generation immigrants, we include those living in an identifiable statistical metropolitan area in order to maintain the same sample as in the cultural transmission analysis (see below).

heads of household who are first-generation immigrants, originating from 38 different countries.[12]

We cannot use a sample of second-generation immigrants, as other papers do, because there is no information on parents' birth place in the 2015 ACS. Nonetheless, our sample of young arrivals can be considered quite similar to a sample of second-generation immigrants. In both cases, those individuals (young-arrival first-generation immigrants and second-generation immigrants) have been exposed to US markets and institutions almost their entire lives. They are unlikely to suffer language barriers or the immigration shock (Fernández 2007; Fernández and Fogli 2006, 2009; Furtado et al. 2013; Giuliano 2007; Marcén et al. 2018). Then, as Furtado et al. (2013) indicate, a sample of young-arrival first-generation immigrants can be useful in examining whether a cultural effect exists. It is true that there are other US Censuses containing information on second-generation immigrants, but the most recent of those was the 1970 US Census. Because marriage patterns have changed in recent decades (Thornton and Young-DeMarco 2001; Stevenson and Wolfers 2007), we prefer to use more up-to-date data.

The cultural proxy is measured as the home-country proportion of individuals living with their partners, utilizing data from the Integrated Public Use Microdata Series International (IPUMS International).[13] To calculate this variable, we have chosen country-of-origin Censuses as close as possible to the year 2015 (see Table 11 in the Appendix). In this setting, it is assumed that the behavior of those immigrants who respond to the 2015 ACS is similar to the behavior of their counterparts in their country of origin in that same period of time.[14] The IPUMS International allows us to construct the cultural variable by age and education level. This is important, since most of the conclusions of prior studies on the effects of culture are based on the assumption that culture does not differ within each country of origin, which generates some concerns over the validity of the results. The composition of immigrants living in the US can be different from that of individuals living in their country of origin. For example, immigrants living in the US can be younger and more educated than individuals living in their country of origin. Then, their behavior can vary from that captured by the cultural proxy. In addition, if the attitudes toward living together also change by age group and education, the use of just one measure of culture by country does not take into account that heterogeneity. To tackle these potential problems, we follow the proposal of Marcén et al. (2018) and calculate the cultural proxy by country of origin, age, and education level.

Table 1 presents the summary statistics for the main variables by country of origin. The first column shows large variations in the proportion of immigrants living together, across home countries: from around 40 % in Jamaica, to 70% in Poland and Portugal. Since they all live under the same laws, institutions, and economic conditions, these large differences may indicate the presence of different social norms

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[12] We use all the observations from countries where we have information on the cultural proxy in the IPUMS International. We include those immigrants originating from countries of origin where married and unmarried couples are identified in the Census data.

[13] As before, this has been calculated using a sample of heads of household aged 18 to 50.

[14] This strategy is followed in the rest of the literature. As Fernández (2007) explains, culture adjusts very slowly and our results do not vary when we measure the cultural proxy in different years.

Table 1 Summary statistics by country of origin

Country of origin	Proportion of immigrants living together	Home-country cultural proxy	Man	White	Black	Asian	Age	High school graduate	Some college	More college	Observations
Argentina	0.56	0.56	0.46	0.83	0.00	0.07	36.68	0.22	0.24	0.49	41
Armenia	0.52	0.79	0.38	1.00	0.00	0.00	31.14	0.24	0.29	0.43	21
Brazil	0.60	0.72	0.60	0.74	0.02	0.07	36.23	0.23	0.26	0.51	43
Canada	0.60	0.61	0.43	0.89	0.03	0.08	38.92	0.17	0.20	0.62	343
Chile	0.56	0.75	0.52	0.88	0.00	0.00	35.28	0.08	0.40	0.52	25
China	0.57	0.90	0.54	0.06	0.00	0.94	35.87	0.07	0.14	0.78	343
Colombia	0.58	0.71	0.54	0.80	0.00	0.01	37.06	0.17	0.26	0.53	115
Costa Rica	0.62	0.73	0.33	0.62	0.10	0.00	33.00	0.33	0.24	0.38	21
Cuba	0.66	0.72	0.49	0.87	0.04	0.00	42.12	0.30	0.32	0.32	169
Dominican Republic	0.55	0.67	0.41	0.37	0.17	0.02	34.36	0.26	0.34	0.32	158
Ecuador	0.59	0.74	0.33	0.61	0.00	0.00	37.76	0.22	0.30	0.43	46
El Salvador	0.61	0.75	0.50	0.67	0.01	0.00	34.57	0.39	0.25	0.20	145
France	0.60	0.38	0.52	0.96	0.04	0.00	40.06	0.25	0.21	0.52	48
Germany	0.64	0.80	0.51	0.86	0.12	0.01	38.29	0.19	0.28	0.51	946
Greece	0.64	0.65	0.47	1.00	0.00	0.00	42.74	0.21	0.25	0.55	53
Haiti	0.51	0.77	0.45	0.04	0.96	0.00	37.04	0.23	0.26	0.47	53
India	0.63	0.88	0.56	0.03	0.00	0.96	35.73	0.05	0.11	0.83	194
Iran	0.55	0.93	0.42	1.00	0.00	0.00	37.84	0.05	0.15	0.80	55
Iraq	0.62	0.90	0.69	0.96	0.00	0.04	38.46	0.38	0.38	0.19	26
Italy	0.66	0.70	0.52	0.95	0.03	0.02	38.35	0.21	0.26	0.50	133
Jamaica	0.40	0.28	0.41	0.08	0.89	0.01	37.43	0.25	0.36	0.38	99
Mexico	0.66	0.78	0.42	0.64	0.00	0.00	35.47	0.42	0.26	0.15	2234

Table 1 continued

Country of origin	Proportion of immigrants living together	Home-country cultural proxy	Man	White	Black	Asian	Age	High school graduate	Some college	More college	Observations
Netherlands	0.64	0.60	0.57	0.89	0.04	0.07	36.75	0.14	0.14	0.71	28
Nicaragua	0.55	0.79	0.48	0.65	0.03	0.00	33.79	0.23	0.45	0.30	66
Pakistan	0.55	0.91	0.68	0.11	0.00	0.89	34.87	0.05	0.16	0.79	38
Panama	0.53	0.72	0.54	0.65	0.24	0.01	36.63	0.22	0.24	0.54	68
Peru	0.60	0.79	0.38	0.67	0.00	0.02	34.10	0.21	0.30	0.48	63
Philippines	0.63	0.90	0.53	0.13	0.01	0.86	37.85	0.17	0.26	0.56	333
Poland	0.70	0.72	0.52	1.00	0.00	0.00	34.12	0.16	0.20	0.64	50
Portugal	0.70	0.56	0.48	0.97	0.03	0.00	41.22	0.31	0.24	0.33	67
Romania	0.65	0.71	0.61	1.00	0.00	0.00	32.03	0.06	0.32	0.61	31
Spain	0.57	0.70	0.49	0.90	0.05	0.01	37.47	0.18	0.28	0.53	79
Thailand	0.60	0.82	0.47	0.06	0.00	0.94	34.07	0.28	0.26	0.43	159
Trinidad and Tobago	0.41	0.51	0.41	0.00	0.86	0.01	39.05	0.24	0.32	0.38	37
Turkey	0.62	0.92	0.50	0.95	0.05	0.14	41.48	0.21	0.29	0.50	42
United Kingdom	0.62	0.42	0.54	0.87	0.07	0.00	38.20	0.13	0.23	0.64	320
Venezuela	0.49	0.75	0.49	0.89	0.03	0.07	33.54	0.14	0.32	0.54	37
Vietnam	0.63	0.86	0.52	0.01	0.01	0.98	37.21	0.12	0.19	0.65	323
Average	0.62	0.75	0.50	0.60	0.06	0.20	36.77	0.26	0.25	0.42	
Std. Dev.	0.48	0.13	0.50	0.49	0.23	0.40	8.27	0.44	0.43	0.49	

Data comes from the 2015 American Community Survey of IPUMS USA. The sample contains 7052 observations of immigrants, aged 18 to 50, originating from 38 different countries

regarding how individuals should live, with or without a partner. By looking at the home-country proportion of individuals living together in each country of origin, column 2, we cannot deduce a clear relationship between the behavior of the immigrants and that of their counterparts. Although, for example, the lowest proportion of immigrants living with a partner originate from Jamaica, and the country of origin with the lowest proportion of individuals living together (as married or unmarried couples) is also Jamaica, for other countries this is not so clear. The raw data also reveals dissimilarities across countries in gender composition, level of education, and the age of the immigrants; 48% of immigrants are men, with this varying from just 33% in the case of immigrants from Ecuador and Costa Rica, to almost 70% in the case of those from Iraq. The average age of the immigrants in our sample is around 37 years old, with the youngest originating from Armenia, at 31 years old, and the oldest from Greece, at 43 years old. Overall, 26% of the immigrants have completed high school, with the lowest percentage being from India, Iran, and Pakistan (5%), and the highest from Mexico (42%). Regarding those who have completed at least a college degree, the lowest percentages are observed among those from Mexico (41%), and the highest among those from Iran and Pakistan (95%). Fewer differences are observed in terms of race: 60% of the immigrants are white, with the immigrants originating from 10 of the 38 countries being predominantly non-white. Since there are differences across countries for all these variables, we consider that their incorporation in our analysis is necessary.

Attitudes to the living-together decision can vary within each home country and across age groups. For example, in some countries, individuals who decide to live with a partner when they are young can be stigmatized, whereas, in other countries, living together when young may be socially accepted. If this is transmitted to the behavior of our sample of immigrants, the incorporation of more controls cannot help us to take into account the cultural differences within each country. We propose a more precise measure of culture, redefining the cultural proxy by country of origin and age group. The home-country proportion of individuals living together, by country of origin and age interval, is reported in Table 2, where three age intervals are considered: 18 to 28, 29 to 39, and 40 to 50. The differences across countries and age intervals are not limited to developing countries but, as Stevenson and Wolfers (2007) indicate, family ways of life vary widely across developed countries. Among those aged 18 to 28, 66% live with a partner, ranging from less than 20% for France, Jamaica and United Kingdom, to a high of 91% for Iran. In both cases, the minimum proportion of individuals living together corresponds to that age group (18–28), but this pattern of behavior is different in other countries. Of the 29 countries having more than 70% of individuals living with a partner in the second age interval (29–39), 25 achieve their maximum at that age group. However, all the countries with less than 70% of individuals living together in the second age group achieve their maximum when they are aged 40 to 50. In the latest age interval (40–50), the lowest proportions are for those residing in France, Jamaica and United Kingdom (less than 52%) and the highest for China, Iran, Pakistan and Turkey (more than 91%). We recognize that, although some of those countries are the same as those observed in the first age group, the rest of the countries do not behave in a similar way. There are countries with low proportions of individuals living with a partner in
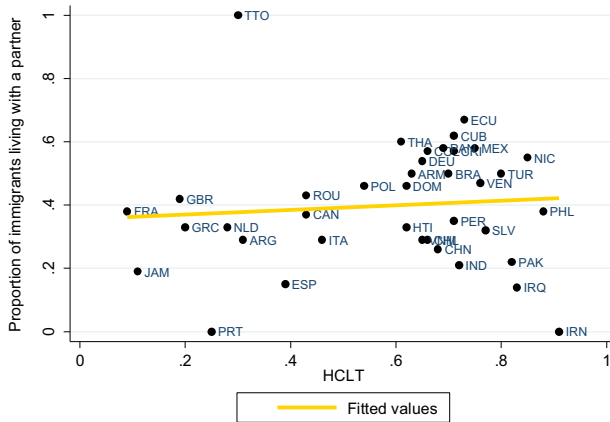
Table 2 Proportion of individuals living with a partner in each country of origin by age group

| Country	18 to 28 years old	29 to 39 years old	40 to 50 years old
Argentina	0.31	0.59	0.64
Armenia	0.63	0.83	0.80
Brazil	0.70	0.76	0.70
Canada	0.43	0.64	0.64
Chile	0.66	0.78	0.74
China	0.68	0.95	0.92
Colombia	0.66	0.75	0.70
Costa Rica	0.71	0.75	0.71
Cuba	0.71	0.75	0.69
Dominican Republic	0.62	0.70	0.66
Ecuador	0.73	0.77	0.72
El Salvador	0.77	0.78	0.70
France	0.09	0.39	0.51
Germany	0.65	0.86	0.81
Greece	0.20	0.66	0.75
Haiti	0.62	0.81	0.81
India	0.72	0.93	0.89
Iran	0.91	0.95	0.91
Iraq	0.83	0.92	0.90
Italy	0.46	0.71	0.76
Jamaica	0.11	0.27	0.38
Mexico	0.75	0.81	0.76
Netherlands	0.28	0.63	0.75
Nicaragua	0.85	0.82	0.73
Pakistan	0.82	0.94	0.92
Panama	0.69	0.76	0.70
Peru	0.71	0.83	0.80
Philippines	0.88	0.92	0.87
Poland	0.54	0.78	0.74
Portugal	0.25	0.55	0.64
Romania	0.43	0.76	0.76
Spain	0.39	0.71	0.77
Thailand	0.61	0.85	0.85
Trinidad and Tobago	0.30	0.51	0.55
Turkey	0.80	0.95	0.93
United Kingdom	0.19	0.50	0.50
Venezuela	0.76	0.78	0.71
Vietnam	0.65	0.92	0.88
Average	0.66	0.80	0.75
Std. Dev.	0.17	0.12	0.11

The home-country proportion of individuals living together by country of origin and age interval has been calculated using information from the IPUMS International. See Table 11 in the Appendix

the first age group but with a high proportion of individuals in the latest age group (see the case of the Netherlands).

Is that pattern of behavior mimicked by the immigrants living in the US? Figs. 1–3 show the relationship between the proportion of immigrants living with their partners in the US, and the home-country proportion of individuals living with their partners,

Fig. 1 The proportion of immigrants living with a partner in the US, and the proportion of individuals living with a partner in their respective countries of origin. All aged 18 to 28. Notes: The home-country proportion of individuals living with a partner (married or unmarried), calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of immigrants living with a partner of those countries of origin, calculated using data from the 2015 American Community Survey (ACS) of IPUMS is plotted on the y-axis. In both cases, individuals aged 18 to 28 are considered
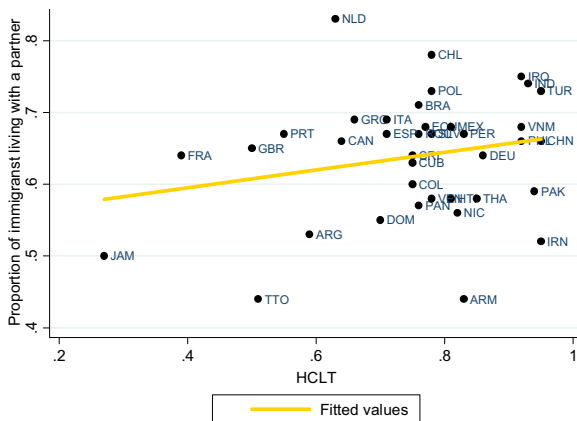
Fig. 2 The proportion of immigrants living with a partner in the US, and the proportion of individuals living with a partner in their respective countries of origin. All aged 29 to 39. Notes: The home-country proportion of individuals living with a partner (married or unmarried), calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of immigrants living with a partner of those countries of origin, calculated using data from the 2015 ACS is plotted on the y-axis. In both cases, individuals aged 29 to 39 are considered
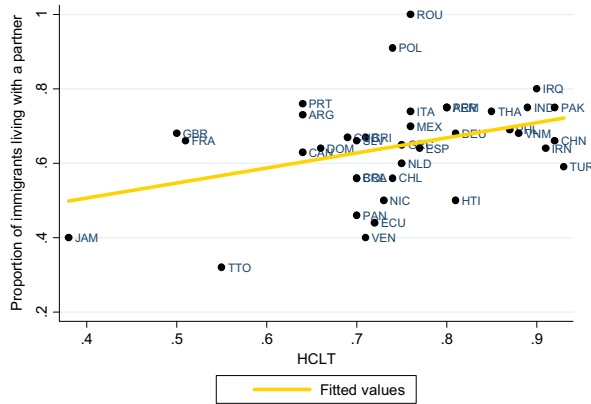
Fig. 3 The proportion of immigrants living with a partner in the US, and the proportion of individuals living with a partner in their respective countries of origin. All aged 40 to 50. Notes: The home-country proportion of individuals living with a partner (married or unmarried), calculated using data from the IPUMS International, is plotted on the x-axis, while the proportion of immigrants living with a partner of those countries of origin, calculated using data from the 2015 ACS, is plotted on the y-axis. In both cases, individuals aged 40 to 50 are considered

by country of origin and age interval. For those aged 29–39 and 40–50 there is a positive relationship between the two variables: the higher the home-country proportion of individuals living with their partner, the greater the proportion of immigrants living with their partners in the US. This is not so clear for the first age group, which may indicate that cultural differences within the countries of origin may flow from other characteristics of the individuals.

Social norms can differ depending on education level. It may be more socially acceptable for an individual to live without a partner if she/he is more educated, but it can be less acceptable for an individual with a low education level. This can also vary by age group. Then, as before, to address this issue, we measure the cultural proxy by country of origin, education level, and age group, with the education groups being: not completed high school, completed high school, some college (1 to 3 years of degree studies), and more college (4 and more years of degree studies).[15] The culture of each country of origin includes 12 different measures. In the next section, we show whether the redefinition of the cultural proxy is useful in better determining whether culture does, in fact, play a role in the decision to live with a partner.

4 Results

4.1 Main results and robustness checks

Table 3 presents the estimates for our main specification. As can be seen in column 1, our results are consistent with the literature. Men are more likely to report being

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[15] For those countries that do not distinguish between some college and more college, we have measured the cultural proxy for the tertiary level of education. Results are maintained without the immigrants originating from those particular countries of origin.

Table 3 The effect of culture on the living-together decision

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Home-country proportion of individuals living together	0.133***(0.040)	0.535***(0.162)	0.373***(0.093)	0.397***(0.083)	0.347***(0.128)	0.389***(0.105)	0.275**(0.108)	0.204***(0.066)	0.434***(0.133)
Male	0.081***	0.085***	0.084***	0.081***	0.027*	0.121***	0.086***	0.083***	0.083***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.015)	(0.012)	(0.012)	(0.013)	(0.012)
White	0.003	0.021*	0.019*	0.028**	−0.001	0.030***	0.026**	0.027***	0.150
	(0.017)	(0.012)	(0.011)	(0.011)	(0.022)	(0.010)	(0.012)	(0.008)	(0.103)
Black	−0.194***	−0.151***	−0.155***	−0.149***	−0.275***	−0.113***	−0.144***	−0.130***	−0.082
	(0.020)	(0.027)	(0.025)	(0.020)	(0.034)	(0.029)	(0.025)	(0.023)	(0.127)
Asian	−0.066***	0.007	0.006	0.014	−0.033	0.024	0.025	−0.010	−0.014
	(0.020)	(0.035)	(0.035)	(0.036)	(0.072)	(0.031)	(0.035)	(0.023)	(0.128)
Age	0.076***	0.057***	0.052***	0.058***	0.131**	0.014	0.056***	0.033**	0.055***
	(0.015)	(0.016)	(0.014)	(0.012)	(0.059)	(0.013)	(0.009)	(0.015)	(0.012)
Age^2/100	−0.091***	−0.068***	−0.064***	−0.072***	−0.205*	−0.014	−0.070***	−0.038*	−0.068***
	(0.020)	(0.022)	(0.019)	(0.017)	(0.106)	(0.015)	(0.013)	(0.019)	(0.017)
High school graduate	0.013	0.024	0.039*	0.035*	0.059**	0.039	0.040*	0.028*	0.037*
	(0.018)	(0.021)	(0.021)	(0.020)	(0.029)	(0.024)	(0.020)	(0.016)	(0.020)
Some college	−0.031	−0.008	0.032	0.032	0.037	0.035	0.025	0.030	0.027
	(0.030)	(0.036)	(0.031)	(0.032)	(0.046)	(0.028)	(0.031)	(0.026)	(0.032)
More college	0.012	0.047	0.079**	0.078**	0.028	0.099***	0.074**	0.075***	0.075**
	(0.031)	(0.038)	(0.033)	(0.032)	(0.043)	(0.034)	(0.033)	(0.024)	(0.033)
Previously married								−0.566 (0.023)***	
								(0.023)	
Children at home								0.399***	
								(0.014)	
Employed								−0.005	
								(0.014)	
Main language: English								0.005	
								(0.015)	

Table 3 continued

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
White × Home-country proportion of individuals living together									−0.181(0.136)
Black × Home-country proportion of individuals living together									−0.100 (0.174)
Asian × Home-country proportion of individuals living together									0.023 (0.170)
State fixed effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
MSA fixed effects	No	No	No	Yes	No	No	No	No	No
Country of origin fixed effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Decade of immigration fixed effects × Country of origin fixed effects	No	No	No	No	No	No	Yes	No	No
P-value (F-test of HCLT + White × HCLT = 0)									0.0444
P-value (F-test of HCLT + Black × HCLT = 0)									0.0536
P-value (F-test of HCLT + Asian × HCLT = 0)									0.0011
Observations	7052	7052	7052	7052	3128	9736	7052	7052	7052
R^2	0.078	0.089	0.091	0.122	0.130	0.063	0.108	0.391	0.092

The home-country proportion of individuals living together as married and unmarried couples is calculated using information from the IPUMS International. The American Community Survey 2015 sample consists of immigrants aged 18 to 50 who arrived in the US at or before the age of 5 and who report a country of origin. In the first column, the home-country cultural proxy has been calculated by country of origin. The second column incorporates the cultural proxy measured by country of origin and age group (18–28, 29–39 and 40–50). In the rest of the columns, our variable of interest has been calculated by country of origin, age group, and education level. We change our sample in columns 5 and 6 including those individuals between 18 and 35 years old in column 5, and those between 25 and 64 in column 6. Column 7 includes terms of interaction between the decades of years of immigration and the country of origin fixed effects. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

married or living as an unmarried couple, since, for example, they are more likely to remarry when they divorce (Furtado et al. 2013).[16] Also, as prior studies suggest, black individuals are much more likely to live without a partner than individuals of other races (Stevenson and Wolfers 2007). The impact of age follows an inverted U-shape, achieving the maximum at almost 41 years old, which is in line with the literature suggesting that older individuals are more likely to be divorced, and thus, to live without a partner (Furtado et al. 2013). The effect of the level of education is not so clear, since it does not appear to be statistically significant in several regressions, regardless of the measure of culture used (with/without taking the education issue into consideration in the home country proxy of culture). This could be due to the fact that the level of education is a potential factor in the choice of a different ethnic partner (Stevenson and Wolfers 2007), which can affect the probability of couple dissolution. We revisit the choice of a same or different ethnic partner in subsection 4.4.

With respect to our variable of interest, the estimated coefficient on the cultural proxy (HCLT) indicates that a higher proportion of individuals living together as married or unmarried couples in an immigrant's country of origin is associated with an increase in the probability that that immigrant reports living with a partner (see column 1). Taking the epidemiological approach into account, this empirical evidence can be interpreted as a cultural effect. We must clarify that the cultural proxy is defined as the home-country proportion of individuals living together (as married or unmarried couples) in column 1. In that specification, there is only one measure of culture for each country of origin, which is a common strategy in the research on the impact of culture. Nevertheless, as explained above, with this approach we are not considering the possible cultural differences within each home country, which is also a common problem in the literature on cultural issues. Since the preferences and beliefs of individuals can vary depending on their age and education level, and this can also vary across countries, we have re-estimated the Eq. (1), by redefining the cultural proxy by age interval and country of origin, and by measuring the cultural proxy by age, education level, and country of origin. In this setting, there are 4 and 12 different measures of the culture for each home country, respectively. Estimates are in columns 2 and 3 of Table 3. In both cases, the redefinition of the cultural proxy in several categories for each country of origin permits us to include country-of-origin fixed effects in order to pick up the unobserved heterogeneity across countries. As in column 1, we detect a positive relationship between the home-country proportion of individuals living together (regardless of the categories included in the cultural proxy) and the probability that an immigrant lives with a partner in the US. The estimated coefficient is considerably greater in columns 2 and 3 than in the first column, even after including the country-of-origin fixed effects, which suggests that we are measuring the cultural impact more precisely after considering the cultural

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[16] Note that our sample only incorporates heads of household. The analysis by gender is described below.

differences within countries by age and education level. [17] Then, their inclusion is also necessary. [18]

Our findings point to culture being an important factor. We find that when the cultural proxy (HCLT) increases by 1 percentage point, there is an increase of around 0.373 percentage points in the probability that an immigrant reports living with a partner in the US. Thus, because of the cultural effect, immigrants from the country with the highest HCLT, Iran, are about 24.24 percentage points more likely to be living with a partner in the US than immigrants from Jamaica, the country of origin with the lowest HCLT. Adding Metropolitan Statistical Areas (MSAs) fixed effects rather than state fixed effects does not alter our conclusions (see column 4).[19]

Variations in the sample selection regarding age also do not affect our conclusions. Culture appears to be an important factor when we restrict our sample to young individuals aged 18 to 35 (see column 5), as well as when we enlarge our sample to those aged 25 to 64 (see column 6).[20] It is remarkable that the magnitude of the effect is quite similar in all age groups (see columns 3, 5, and 6). Unobserved characteristics at the time of migration could also have an effect on our estimates which, as explained in the methodology section, has been addressed by including year of immigration fixed effects, but even in this scenario it could be surmised that those time-varying unobserved factors vary at the country of origin level. To tackle this issue, we have incorporated interactions between the country of origin fixed effects and the period of migration fixed effects. Results are maintained, see column 7.[21]

Although the ACS reports other individual characteristics, such as employment status, or whether couples have children, we have not considered these in our

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[17] It is also possible that controlling for education may be over-controlling since we are also considering those same categories of education in our cultural proxy. For this reason, the effect of education on the living-together decision may be captured by the cultural proxy. To examine this issue, we have repeated the regressions without education controls and our findings do not change (see an example in Table 10 of the Appendix). Also, it could be that the choice of education level is affected by culture. Thus, there could be an indirect effect of culture on the living-together decision via education choice. To check this, we have redefined the dependent variable as a dummy variable that takes the value 1 if an individual has at least some college, and 0 otherwise. The explanatory variables are our first cultural proxy (without incorporating the education differences) in addition to the rest of the controls, excluding education. Estimates are presented in Table 10 of the Appendix. We find no effect of the cultural proxy on the education choice. Following the rest of the literature exploring the effect of culture on several variables, such as divorce and fertility (Furtado et al. 2013; Marcén et al. 2018), we maintain the education controls in the rest of the paper.

[18] The rest of the regressions shown in the paper only include the cultural proxy measured by age, education level, and country of origin, since this variable allows us to better capture the culture of each country of origin. As can be seen, the R^2 is higher when we use this measure of culture rather than the rest of the cultural proxies. For consistency, we have repeated the analysis with the previous measures of culture and our conclusions on the impact of culture are maintained, although there are small variations in the magnitude of the effect.

[19] IPUMS USA defines a metropolitan area as a region formed by neighboring communities that have a high degree of economic and social integration with the urban core. The population threshold to identify an MSA is 100,000 inhabitants.

[20] We have repeated the analysis using the 2000 US Census and our results are the same.

[21] Because of the large number of interactions that this generates, to run this regression we had to redefine the time of migration fixed effects, using dummies for the decade in which the immigrants arrived in the US.

analysis because of endogeneity concerns, following Furtado et al. (2013). It is comforting that adding dummy variables to control for whether individuals were previously married, for whether the individuals live with children in the household, and for whether they are employed or not, does not alter our findings on the existence of a cultural effect (see column 8 of Table 3, where we have added a dummy variable for whether English is the main language spoken by the individual). Speaking English is an individual characteristic that may affect the probability of living together, as a proxy of the degree of integration of the immigrant in the US. In our analysis, this can be important, since it may reduce the costs of integration into the host society, resulting in a greater influence of the host country culture.[22] Our estimates show that the cultural influence of the home country is still there, even when adding or subtracting the language control.

The last column of Table 3 incorporates interaction terms between race and our cultural proxy variable. This analysis allows us to examine how the cultural effect varies depending on the race of the individual. We observe some differences, with a more significant effect for those who report Asian as their race, and a lower effect for those who report being White. In all cases, the effect of culture appears to be statistically significant. It is worth noting that immigrants from all but 6 countries of origin (3 for Asian and 3 for Black) report being White in almost 90% of the sample, which can be an important factor in the estimated coefficients obtained in this regression. In any case, we have maintained the race controls in the rest of the specifications. Results do not vary with/without these controls.

Simple robustness checks, including and excluding those immigrants from countries of origin with the highest number of observations and with the highest and lowest HCLT, are presented in Table 4. In column 1, we drop Mexicans and Germans from our sample of first-generation immigrants, because they are the largest immigrant groups. In column 2, we repeat the analysis without those from Jamaica, which presents the lowest HCLT, and without those from Iran, who have the highest HCLT. Our findings do not vary. For further evidence that our findings are not affected by heterogeneity across countries, we have repeated the analysis by including controls for observable characteristics of the home countries (see column 4 of Table 5). We include the total fertility rate, the unemployment rate, GDP per capita (in constant 2010 $US), the crude marriage rate, three dummy variables for whether the predominant religion in a country of origin is Catholicism, Islam, and Protestantism, and the proportion of religious practitioners in the home country.[23] We do not have information on all these controls for the entire sample of countries of

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[22] Almost all the countries considered in this analysis have a greater proportion of individuals living together than that of the US, which is around 0.51. Then, the assimilation of the US living together culture, if this happens, in the case of immigrants would result in a lower preference for living together as married or as an unmarried couple. We explore this issue below.

[23] The total fertility rate is defined as the mean number of children that would be born alive to a woman during her lifetime if she were to pass through her childbearing years conforming to the fertility rates by age of a given year. Unemployment rate is the percentage of the total labor force, that is without work but available for and seeking employment. GDP per capita is gross domestic product divided by mid-year population. Crude marriage rates are the annual number of marriages per 1,000 mid-year population. Data are collected for the year 2015 (or for the closer year if no data is available for that year) and come from the World Bank Data and from the UN Demographic Yearbooks. The information to elaborate the religion variable came from The World Fact Book of the Central Intelligence Agency.

Table 4 Simple robustness checks: different subsamples, cross-country heterogeneity, definition of the cultural proxy using 1980s international censuses

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)
Home-country proportion of	0.237**	0.393***	0.275**	0.298**	0.398***
individuals living together	(0.107)	(0.091)	(0.125)	(0.109)	(0.116)
Male	0.072***	0.083***	0.083***	0.082***	0.087***
	(0.021)	(0.013)	(0.013)	(0.013)	(0.014)
White	0.004	0.020*	0.019	0.013	0.020*
	(0.040)	(0.011)	(0.011)	(0.015)	(0.011)
Black	−0.146***	−0.156***	−0.142***	−0.153***	−0.121***
	(0.047)	(0.027)	(0.036)	(0.037)	(0.038)
Asian	−0.020	0.005	−0.000	−0.040	−0.004
	(0.047)	(0.035)	(0.037)	(0.040)	(0.044)
Age	0.054**	0.051***	0.054**	0.052**	0.059***
	(0.022)	(0.014)	(0.020)	(0.020)	(0.013)
Age^2/100	−0.070**	−0.061***	−0.059*	−0.057*	−0.069***
	(0.034)	(0.019)	(0.028)	(0.029)	(0.020)
High school graduate	0.095	0.039*	0.032***	0.031***	0.041*
	(0.082)	(0.020)	(0.009)	(0.008)	(0.020)
Some college	0.141*	0.035	−0.012	−0.014	0.053*
	(0.076)	(0.032)	(0.025)	(0.026)	(0.028)
More college	0.176**	0.084**	0.053**	0.049**	0.078**
	(0.080)	(0.033)	(0.021)	(0.019)	(0.035)
Total fertility rate				−0.060*	
				(0.034)	
Unemployment rate				−0.014***	
				(0.001)	
GDPpc				0.025	
				(0.016)	
Crude marriage rate				−0.011	
				(0.013)	
Catholic population				0.011	
				(0.048)	
Protestant population				−0.133*	
				(0.065)	
Muslim population				−0.049	
				(0.047)	
Religious practitioners				0.094	
				(0.074)	
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	No	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3872	6898	4521	4521	5590
R^2	0.117	0.087	0.083	0.081	0.096

The home-country cultural proxy has been calculated by country of origin, age group and education level in all estimations. We have excluded those immigrants originating from Mexico and Germany in column 1 and those originating from Jamaica and Iran in column 2. In the last column, the home-country has been calculated using International Censuses of 1980 (those containing information in the 1980s). Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

Table 5 The effect of culture on the living-together decision: Gender differences

Dependent Variable: Live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Sample	All	Men	Women	All	Men	Women	All	Men	Women
Home-country proportion of individuals living together	0.373***	0.408***	0.379***	0.338***	0.282**	0.363***	0.372***	0.385***	0.373***
	(0.093)	(0.082)	(0.112)	(0.101)	(0.106)	(0.120)	(0.075)	(0.087)	(0.088)
Male	0.084***			-0.073***			0.022		
	(0.012)			(0.016)			(0.013)		
White	0.019*	0.001	0.033	0.008	-0.029	0.031	0.012	-0.003	0.022
	(0.011)	(0.017)	(0.020)	(0.018)	(0.020)	(0.028)	(0.011)	(0.012)	(0.022)
Black	-0.155***	-0.093**	-0.208***	-0.204***	-0.135***	-0.240***	-0.170***	-0.095***	-0.226***
	(0.025)	(0.037)	(0.028)	(0.028)	(0.028)	(0.048)	(0.016)	(0.025)	(0.028)
Asian	0.006	0.000	0.021	0.042	-0.030	0.089	0.038	-0.013	0.085**
	(0.035)	(0.038)	(0.051)	(0.042)	(0.050)	(0.053)	(0.029)	(0.028)	(0.041)
Age	0.052***	0.054***	0.056**	0.037**	0.089***	0.006	0.035***	0.047***	0.026
	(0.014)	(0.019)	(0.021)	(0.016)	(0.020)	(0.026)	(0.010)	(0.014)	(0.016)
Age²/100	-0.064***	-0.061**	-0.078**	-0.038*	-0.107***	0.006	-0.044***	-0.055***	-0.037*
	(0.019)	(0.023)	(0.032)	(0.022)	(0.027)	(0.035)	(0.013)	(0.017)	(0.022)
High school graduate	0.039*	0.008	0.062***	0.037***	-0.028	0.090***	0.048***	0.009	0.080***
	(0.021)	(0.032)	(0.023)	(0.013)	(0.022)	(0.020)	(0.016)	(0.023)	(0.017)
Some college	0.032	-0.002	0.067*	-0.025	-0.086*	0.045*	0.021	-0.012	0.060**
	(0.031)	(0.042)	(0.035)	(0.018)	(0.043)	(0.026)	(0.020)	(0.029)	(0.026)
More college	0.079**	0.014	0.135***	-0.021	-0.116**	0.056**	0.054**	-0.007	0.107***
	(0.033)	(0.043)	(0.036)	(0.025)	(0.051)	(0.026)	(0.022)	(0.034)	(0.023)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7052	3551	3701	6331	2656	3675	11117	4938	6179
R^2	0.091	0.137	0.099	0.131	0.206	0.129	0.069	0.121	0.076

The cultural proxy is measured by country of origin, age group, and education level. Column 1 coincides with Column 3 of Table 3. Columns 2, 5 and 8 only incorporate immigrant men, and columns 3, 6 and 9 only incorporate immigrant women. In columns 4 to 6 we have incorporated non-head of household and exclude head of household in the living together sample. Columns 7 to 9 incorporate both head and non-heads of household. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

origin. Results are the same when we run the analysis with that reduced sample (see column 3 of Table 4). Cross-country differences in fertility behavior may be driving the marital decisions if, for example, those countries with greater preferences for having children (with high fertility rates) are also more likely to have their children when the parents are living together (as married or unmarried couples), influencing the marital decision. Similarly, dissimilarities in economic conditions (unemployment and GDP) across countries may have a different impact on marital behavior if, for example, those countries with worse economic conditions also have a greater necessity for more traditional families, where a single mother has more difficulty living without a partner. The crude marriage rate can be considered as an alternative measure of culture with respect to the immigrants' decision to marry. Unfortunately, it is not useful for capturing the decision of living together as an unmarried couple. Then, we incorporate that rate in the analysis in order to show that cross-country variations in the crude marriage rate have no effect on our estimates. To check whether our estimates are, in fact, capturing the effect of our proxy of culture rather than differences of religion, which has also been suggested in the literature as a measure of culture (Lehrer 2004; Lehrer and Chiswick 1993), we have added controls for whether the country of origin has Catholicism, Islam, or Protestantism as the predominant religion. As explained in Furtado et al. (2013), religions may affect living-together decisions since some belief systems often stigmatize divorced or single individuals. (For instance, those who divorce are not permitted to remarry in certain religions.) In the same vein, we have included the proportion of religious practitioners, using data from the World Values Survey (wave 2010–2014).[24] As shown in the fourth column, the estimated coefficient capturing the effect of culture is positive and statistically significant after adding all those controls, providing additional evidence that we are capturing the effect of culture, rather than heterogeneity across countries, or other possible cultural proxies (the crude marriage rate or religion in the home country).[25]

Another possible concern with respect to how culture is measured can be the fact that our cultural proxy has been calculated using the most recent Census data available for each country, throughout the paper. Nevertheless, since individuals in our sample may be influenced by the home-country culture to which their parents were exposed – which may change over time - it is possible to argue that we are not capturing the real social norms affecting our individuals. We address this issue by measuring the cultural variable using data from the 1980 Censuses, since our sample of immigrants are 36 years old on average, then their parents could have transmitted their culture when they were children in the 1980s. It is reassuring that, after using older home-country Census data (see column 5 of Table 4), the effect of culture is still detected and is similar to that observed in Table 3. Then, the possible changes in the home-country culture over time do not appear to lead to different findings, which is not surprising since cultures adjust very slowly (Fernández 2007, Furtado et al

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[24] We checked whether our estimates are similar if we exclude the variable controlling for religious practitioners, since the number of observations considerably decreases after its inclusion. Results are invariant.

[25] We re-run the analysis including each of these observable characteristics, one at a time, and our results do not change.

2013, Marcén 2014, Marcén et al. 2018). It is also possible to conjecture that the relationship between the cultural proxy and the proportion of individuals living together depends on the US data used.[26] To address this issue, we extend our sample to include information from the 2010 ACS to the 2015 ACS. This gives us a larger sample of immigrants. As can be seen in Table 10 of the Appendix, the change in the composition of respondents over time does not lead to different conclusions, since the effect of culture is still detected. All the results described in this subsection suggest that culture plays an important role in the living-together decision.

4.2 The analysis of gender differences

Given that the sample selection of immigrants only includes heads of household, in order to have one observation per household, we have also explored the possibility that gender issues could be driving our results. Although the number of men and women in our sample is quite balanced, as can be seen in Table 1, householders have traditionally been men, normally the breadwinners in many traditional societies. If that traditional behavior, in which women form their identities based on wife and mother gender roles, and men on worker and breadwinner gender roles (Akerlof and Kranton 2000), is transmitted to the sample of immigrants, we would expect to observe a greater impact of culture on the male sample than on the female sample of householders, simply because women householders are less likely to follow that traditional social norm (Furtado et al. 2013). To examine this issue, we have divided the sample by gender. Results are shown in columns 2 and 3 of Table 5, for men and women, respectively. Column 1 includes the entire sample for comparison proposals. The estimated points indicate that an increase in the home-country proportion of individuals living together increases the probability of living together for immigrants (men and women, separately) of those countries of origin. The magnitude of the coefficient is almost 8% greater in the case of the male sample than in the female sample, in line with our predictions. What is remarkable in this analysis is that, even with a sample of *less*-traditional individuals (the sample of women householders) with respect to gender issues, we still observe that culture matters in determining the decision to live with a partner.

To provide additional results in favor of our cultural approach, we have also re-run our analysis excluding those heads of household in the living-together sample. Then, we incorporate a sample of immigrant non-heads of household for those living with a partner and, for those without a partner at home, we have maintained the same sample requirements. In that way, since non-heads of household are more likely to be women in the non-head-of-household sample who follow the traditional social norms, we would expect a greater impact of the living-together culture in the sample of women than in the sample of men. As before, column 4 of Table 5 includes all individuals (men and women heads) for easy comparison. The cultural effect is observed in that column and the magnitude of the effect does not vary substantially. Columns 5 and 6 present the results for the men and women sample, respectively.[27]

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[26] Results are unchanged when the 2000 US Census is considered.

[27] The change in the number of observations is due to the fact that the non-heads-of-household are not all immigrants, so those who are native born have been excluded.

In all cases, we find a positive impact of our cultural proxy on the probability of living together, with this impact being greater for women, as we have predicted above. To reinforce our findings, we extend our sample by including heads of household and their immigrant partners in those living together, and only the heads of household for those without a partner in the seventh column, and we estimate the results separately for men and women in columns 8 and 9, respectively. Results remain the same after the extension of the sample. The magnitude of the coefficient is slightly greater in the case of the male sample than in the female sample. Thus, our results do not appear to depend on gender differences.

## 4.3 The effect of culture on other household arrangements

Up to now, we have focused on the decision to live together as married or unmarried couples. Nevertheless, during recent decades, there have been changes in the demographics of marriage in many countries. As is shown in Fig. 4, the crude marriage rate has decreased, especially since the early 1990s. That rate has been calculated for all countries, with the information available in the UN Demographic Yearbooks (several issues). The age at first marriage has also increased and more couples choose to cohabit rather than to marry (Bumpass and Lu 2000; Cherlin 2002; Manning et al. 2014). For individuals aged 20 to 30, this is more remarkable, since the proportion of married individuals is almost the same as those who, in 2011, live with a partner as an unmarried couple (see Fig. 5; data from the IPUMS International). At least in part, the differential behavior of young individuals is being taken into consideration in our analysis, defining the cultural variable by age group and exploring the cultural effect on a sample of young individuals aged 18 to 35 (see Table 3). In this setting, it can be surmised that our estimates may be capturing cross-country differences in traditional laws regarding marriage, rather than the effect of culture on the living-together decision. For example, it is possible to argue that those countries having a high proportion of individuals living together are also those having more traditional social norms concerning marriage, and those countries having a low proportion of individuals living together are those where unmarried couples and the decision to remain single is more widely accepted. To tackle this issue, we have re-run the analysis, separating the sample between married and unmarried individuals.

Table 6 reports our results. The cultural proxy is defined as the home-country proportion of individuals who report being married, by age and education level, in column 1. Our variable of interest is calculated as the proportion of individuals who report living as an unmarried couple, by age and education level, in column 2.[28] The estimated coefficients on the cultural effect are, in both columns, positive and statistically significant, suggesting that culture plays a role. We find that when the home-country proportion of married individuals increases by 1 percentage point, there is a rise of around 0.18 percentage points in the probability that an immigrant reports living with a partner in the US, whereas when the home-country proportion of

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[28] We exclude those immigrants from countries where married and unmarried couples, separately, are not identified in the home-country Census data. Thus, India, China, Portugal, Vietnam, Pakistan, Thailand and Turkey have been removed from our sample.
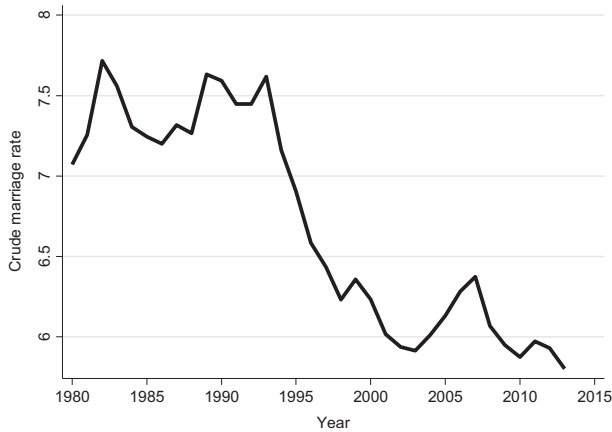
Fig. 4 Evolution of the crude marriage rate from 1980 to 2014. Notes: Data come from the UN Demographic Yearbooks (several issues). The crude marriage rate represented in this figure has been calculated using information on all countries with available data for the period considered
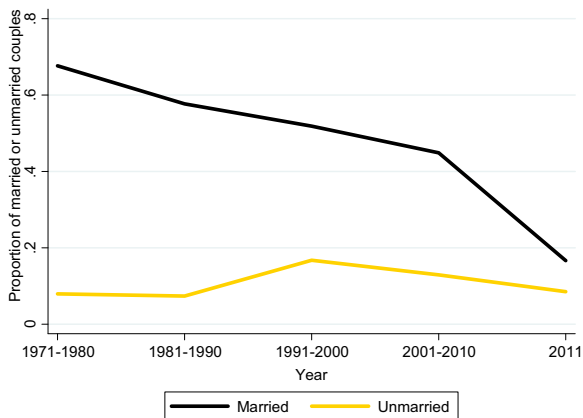
Fig. 5 Evolution of married and unmarried couples from 1970 to 2011: individuals aged 20 to 30. Notes: Data come from the IPUMS International

unmarried couples increases by 1 percentage point, the probability of reporting living as an unmarried couple increases by 0.22 percentage points.[29] These results reinforce our previous findings, since it appears that the behavior of married or unmarried couples is not driving our results. In any case, we recognize that the estimates of the effect of culture on unmarried couples should be taken with caution, since the number of unmarried couples is quite low in several countries represented in the IPUMS International.

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[29] The same is observed after controlling for observable characteristics by country of origin, rather than the country of origin fixed effects.

Table 6 The cultural effect on different household arrangements

Dependent variable	(1) Married	(2) Unmarried	(3) Living together as same-gender married or unmarried couples	(4) Living with adult child	(5) Living with grandparent	(6) Remain single	(7) Family size	(8) Age difference between partners
Home-country cultural proxy	0.178**	0.223**	0.231***	0.253***	2.536***	0.225***	0.313*	4.325*
	(0.078)	(0.090)	(0.080)	(0.056)	(0.406)	(0.068)	(0.164)	(2.320)
Male	0.112***	−0.023***	−0.382***	−0.050***	0.014	−0.004	−0.228***	3.478***
	(0.013)	(0.008)	(0.061)	(0.017)	(0.010)	(0.011)	(0.070)	(0.176)
White	0.063***	−0.045***	−0.015	−0.036***	−0.001	−0.059***	0.003	−0.245*
	(0.012)	(0.008)	(0.016)	(0.011)	(0.006)	(0.012)	(0.043)	(0.140)
Black	−0.085***	−0.086***	−0.178***	0.001	−0.023	0.013	−0.268***	1.304***
	(0.025)	(0.024)	(0.052)	(0.031)	(0.026)	(0.021)	(0.092)	(0.410)
Asian	0.059	−0.027	0.043	−0.033	0.044*	−0.035	0.175	−0.284
	(0.045)	(0.021)	(0.052)	(0.031)	(0.024)	(0.044)	(0.136)	(0.493)
Age	0.074***	0.002	0.039*	0.071***	−0.028	−0.079***	0.093	0.723**
	(0.010)	(0.008)	(0.022)	(0.017)	(0.024)	(0.013)	(0.099)	(0.290)
$Age^2/100$	−0.091***	−0.007	−0.061*	−0.060***	0.038	0.076***	−0.086	−0.925**
	(0.015)	(0.011)	(0.032)	(0.018)	(0.031)	(0.017)	(0.120)	(0.445)
High school graduate	0.064***	−0.013	0.058***	−0.031	0.016	−0.045***	−0.125	−0.185
	(0.022)	(0.019)	(0.018)	(0.018)	(0.011)	(0.014)	(0.089)	(0.220)
Some college	0.063**	−0.016	0.051**	−0.074***	0.005	−0.040**	−0.270**	0.393*
	(0.028)	(0.032)	(0.025)	(0.015)	(0.011)	(0.018)	(0.128)	(0.230)
More college	0.111***	−0.019	0.101***	−0.129***	−0.002	−0.040*	−0.455***	0.314
	(0.031)	(0.034)	(0.029)	(0.022)	(0.017)	(0.023)	(0.107)	(0.231)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 6 continued

Dependent variable	(1) Married	(2) Unmarried	(3) Living together as same-gender married or unmarried couples	(4) Living with adult child	(5) Living with grandparent	(6) Remain single	(7) Family size	(8) Age difference between partners
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5886	5886	3494	6192	7052	7052	6078	4270
R^2	0.110	0.066	0.127	0.161	0.066	0.193	0.181	0.194

The home-country cultural proxy has been calculated by country of origin, age group and education level in all estimations, but considering in each case the specific household arrangement. In columns 1 and 2, we examine both married and unmarried cohabitation, separately. We exclude those immigrants originating from countries of origin where married and unmarried couples, separately, are not identified in the IPUMS International. Column 3 analyzes the impact of culture on same-gender couples. In column 4, we study the effect of culture on living with an adult child. Column 5 shows the effect of culture on the probability of living with grandparents. In column 6, we explore the effect of culture on the decision to remain single. Column 7 shows the effect of culture on family size, and column 8 on the age differences between partners. The variation in the sample size is due to the availability of data for the variables considered. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

In this subsection, we expand the analysis to other household arrangements that have attracted attention in the literature (Stevenson and Wolfers 2007), but, to our knowledge, no researcher has examined whether culture is important in those different household arrangements. We consider: same-gender couples, two different kinds of families with several generations living together (living with an adult child and living with a grandparent), remaining single, family size, and age differences between the members of the couple.[30] The divorce culture has been thoroughly examined by Furtado et al. (2013), and the decision to leave the nest has been studied by Giuliano (2007) - although, in this latter case, with a less-recent dataset, so we can re-examine this issue here. Columns 3 to 8 of Table 6 display the estimates.[31] Estimates in Column 3 show that when the cultural proxy increases by 1 percentage point, there is a rise of around 0.231 percentage points in the probability that an immigrant reports living with a same-gender partner in the US. Our results also point to culture as an important factor when we focus on living with an adult child and living with a grandparent (see Columns 4 and 5). Because of the cultural effect, immigrants from Iran are about 6.5 percentage points more likely to be living with an adult child in the US, and 20.06 percentage points more likely to be living with a grandparent in the US, than immigrants from Jamaica. In Column 6, focusing on the remain-single decision, social norms or cultural factors regarding being single increase the probability of reporting being single by 0.313 percentage points, when the proportion of single individuals in the country of origin increases by 1 percentage point. The effect of culture is also found when we examine family size and age differences between partners. However, our cultural proxy is only statistically significant at the 10% level. Therefore, we show evidence pointing to culture being an important factor in all the living arrangements mentioned above. Our findings suggest that, when individuals choose how they want to live in their home, at least in part, their culture is a factor in their decision.

4.4 Same-or different origin couples: cultural effect

In the previous analysis, we have only considered the country of origin of our householder first-generation immigrants as the indicator of culture.[32] The decision to live with a partner is attributed to the preference of one of the members of the couple (the householder) and not to the beliefs and preferences of the other member, which may also be a determinant. In these circumstances, rather than having two alternatives - living together or not - immigrants have three possibilities: they can live without a partner, live with a partner of the same origin, or live with a partner of different origin. To check this, we propose the use of a model for nominal outcomes, specifically a Multinominal Logit Model (MNL) in which we calculate a separate binary logit for each pair of outcome categories (Nervole and Press 1973). Formally,

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[30] An adult child is a child older than 25.

[31] As before, we construct the cultural variable by age and education level. The variation in the sample size is due to the availability of information.

[32] With the exception of the gender analysis - although, in that case, we have considered a different analysis.

we estimate the following equation:

$$\ln \phi_{m|b} = \ln \frac{\Pr(y = m|\mathbf{x})}{\Pr(y = b|\mathbf{x})} = \mathbf{x}\beta_{m|b} \text{ for } m = 1 \text{ to } J \tag{2}$$

In Eq. (2), b is the base category and m varies from 1 to J, with J being the total number of outcome categories, in our case, three (living without a partner, living with a partner of the same origin, or living with a partner of different origin). The vector $\mathbf{x}$ includes all the variables defined in Eq. (1). Results are presented in columns 1 and 2 of Table 7. In order to analyze the dynamics among the outcome categories, we prefer the use of odds ratios, which is an intuitive method of interpreting the estimates (Greene 2008; Long and Freese 2006). Holding other variables constant, the changed factor in the odds of outcome category m versus outcome category n, when x_i increases by δ, equals:

$$\frac{\phi_{m|n}(\mathbf{x}, x_i + \delta)}{\phi_{m|n}(\mathbf{x}, x_i)} e^{\beta_{i,m|n}\delta}$$

For a unit change in x_i $\delta = 1$, the odds of m versus n are expected to change by a factor of $\exp(\beta_{i,m|n})$, holding all other variables constant. For a standard deviation change in x_i, $\delta = s_{x_i}$, the odds of m versus n are expected to change by a factor of $\exp\left(\beta_{i,m|n} \times s_{x_i}\right)$. To simplify the odds analysis, the odds ratios can be presented in an odds-ratio plot (Long and Freese 2006). Figure 6 shows the odds ratios for the estimates presented in Table 7. The independent variables are represented in separate rows. The horizontal axis indicates the relative magnitude of the coefficients associated with each outcome category. The numbers correspond to the outcome categories: "1" denotes living without a partner, which is the base category in that Fig., "2" living with a partner of the same origin, and "3" living with a partner of different origin. The distance between a given pair of outcome categories indicates the magnitude of the effect, and the statistical significance is shown by drawing a line between categories for which there is no statistically significant coefficient at the 10% level of significance. Results suggest that the cultural proxy is important in the choice of the living status of immigrants. In the case of the HCLT, categories 2 and 3 are to the right of category 1, then the greater the home-country proportion of individuals living together in an immigrant's country of origin, the more likely it is that that immigrant chooses to live with a partner of the same (outcome category 2) or of different origin (outcome category 3).[33] The greater the HCLT, the more likely are individuals to choose living with a partner of the same ethnicity, since outcome category 2 is to the right of outcome category 3. Those are interesting results because, in the literature, papers can be found that use ethnic intermarriage as a measure of the intergenerational assimilation rates of immigrants, (Card et al. 2000; Furtado 2015): the greater the extent of ethnic intermarriage, the greater the scope of the intergenerational assimilation process. However, we cannot dismiss the possibility that parents, or the ethnic communities where immigrants live, instill in those immigrants the preferences for not living with a partner. Then, ethnic intermarriage may not well capture the intergenerational assimilation process, or even the social

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[33] As before, the cultural proxy is measured in this case by age, education level, and country of origin.

Table 7 Same origin or not: Cultural Effect

Dependent variable	(1) Living together as same-origin couple	(2) Living together as different-origin couple	(3) Living together as same-origin couple	(4) Living together as different-origin couple with a native partner	(5) Living together as different-origin couple with a non-native partner
Home-country cultural proxy	1.920***	1.336***	1.911***	1.219***	1.664***
	(0.570)	(0.370)	(0.568)	(0.462)	(0.477)
Male	0.220**	0.444***	0.217**	0.445***	0.429***
	(0.092)	(0.098)	(0.092)	(0.126)	(0.100)
White	0.027	0.129**	0.024	0.051	0.366**
	(0.058)	(0.058)	(0.059)	(0.091)	(0.144)
Black	−0.669**	−0.648***	−0.655**	−0.875***	0.131
	(0.304)	(0.104)	(0.303)	(0.146)	(0.282)
Asian	0.444**	−0.063	0.452**	−0.464*	1.022***
	(0.189)	(0.210)	(0.187)	(0.253)	(0.317)
Age	0.145***	0.218***	0.144***	0.242***	0.144**
	(0.036)	(0.041)	(0.036)	(0.045)	(0.072)
$Age^2/100$	−0.154***	−0.276***	−0.153***	−0.309***	−0.174*
	(0.049)	(0.053)	(0.050)	(0.057)	(0.095)
High school graduate	−0.058	0.564***	−0.056	0.737***	0.114
	(0.103)	(0.101)	(0.102)	(0.122)	(0.159)
Some college	−0.257	0.591***	−0.255	0.794***	0.045
	(0.166)	(0.178)	(0.166)	(0.229)	(0.194)
More college	−0.348*	0.878***	−0.346*	1.078***	0.350*
	(0.210)	(0.152)	(0.209)	(0.195)	(0.188)
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	7052	7052	7052	7052	7052

This table shows the results of two Multinomial Logit Models. The home-country cultural proxy has been calculated by country of origin, age group, and education level in all estimations. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

distance between ethnic groups. Another noticeable result that the odds-ratio plot reveals is that of the education controls; the higher the level of education, the more likely are individuals to choose living with a partner of a different country of origin, then the category chosen is not living with a partner, and the less likely category is living with a partner of the same country of origin. More educated individuals may be better able at adapting to different cultures, making them more likely to live with a
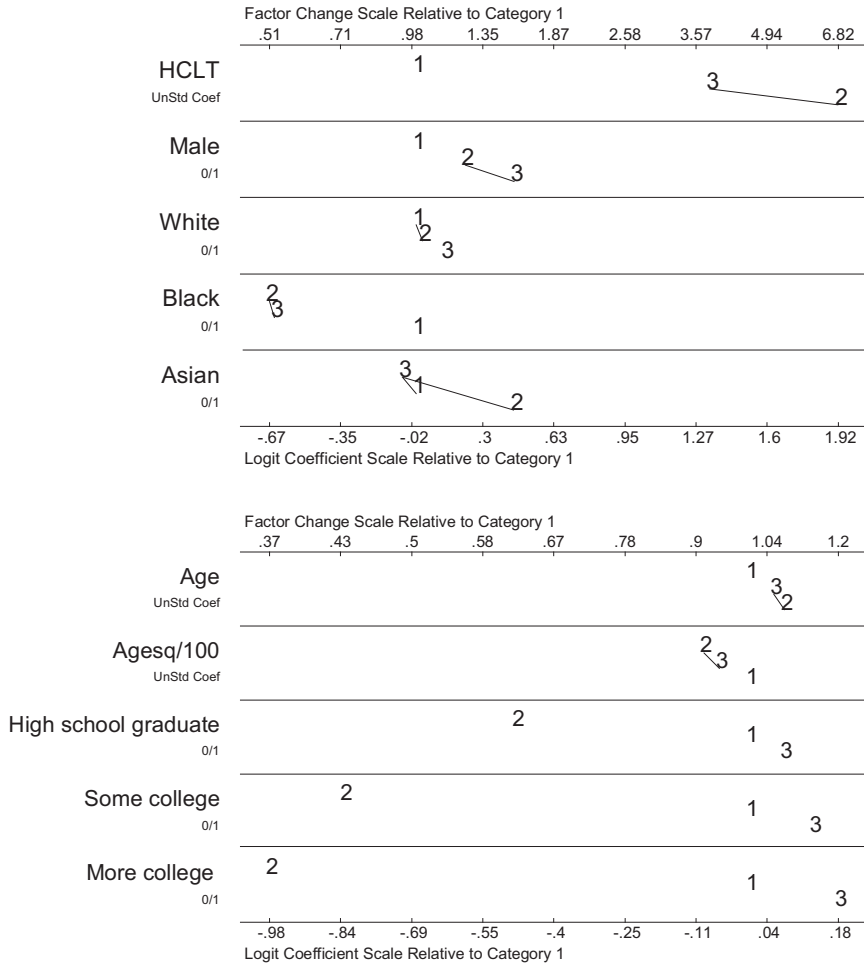
Fig. 6 Remain single (outcome 1), live with a same-origin partner (outcome 2), or live with a different-origin partner (outcome 3): using a Multinomial Logit. Notes: Robust standard errors. With respect to the sample, see notes to Table 3. The additive scale on the bottom axis measures the value of $\beta_{i,m|n}\delta$. The multiplicative scale on the top axis measures $\exp(\beta_{i,m|n})\delta$. The statistical significance is shown by drawing a line between categories for which there is no significant coefficient at the 10% level

partner outside of their ethnicity (Furtado and Theodoropoulos 2011). In addition, the more educated are less likely to reside in ethnic enclaves, which makes it difficult to find potential spouses of the same ethnicity (Furtado and Theodoropoulos 2011). This can explain the results for the education variables presented in the paper.

Furthermore, it is possible that the effect of culture varies depending on whether individuals marry a native partner or an immigrant from a different country of origin. To address this issue, we repeat the analysis to include four different categories: "1" denotes living without a partner, which is the base category in Fig. 7, "2" denotes living with a partner of the same origin, "3" denotes living with a native partner of
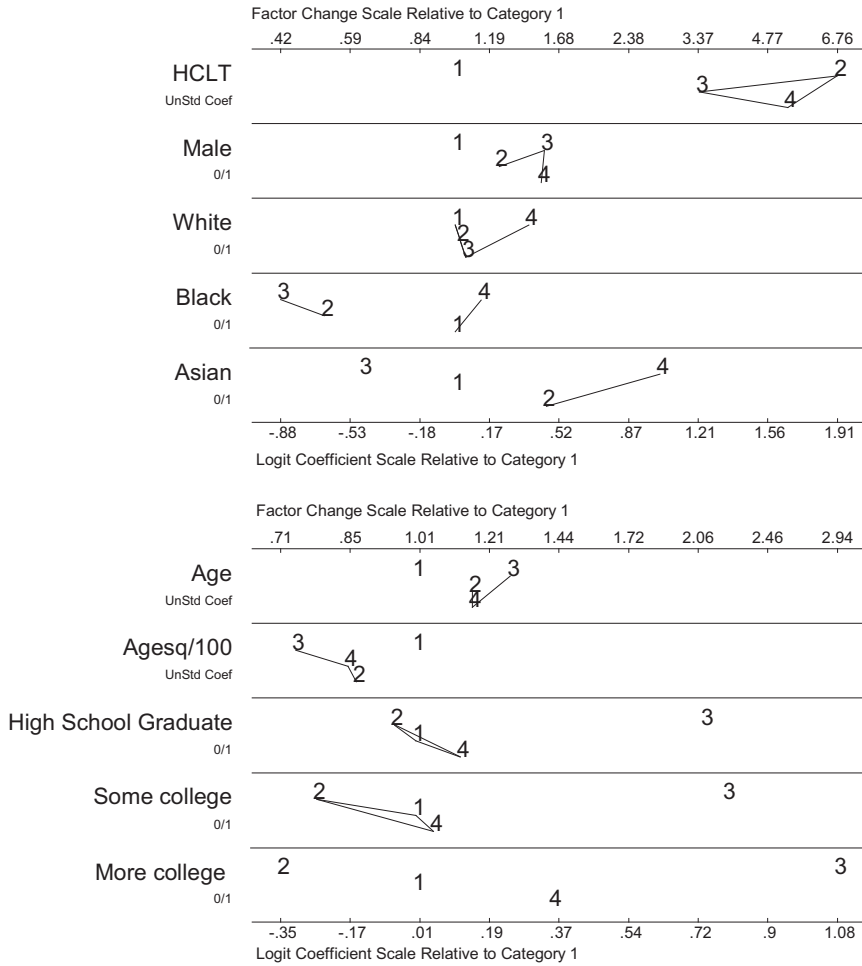
Fig. 7 Remain single (outcome 1), live with a same-origin partner(outcome 2), live with a native different-origin partner (outcome 3), or live with a non-native different-origin partner (outcome 4),: using a Multinomial Logit. Notes: Robust standard errors. With respect to the sample, see notes to Table 3. The additive scale on the bottom axis measures the value of βi,m|nδ. The multiplicative scale on the top axis measures exp(βi,m|n)δ. The statistical significance is shown by drawing a line between categories for which there is no significant coefficient at the10% level

different origin, and "4" denotes living with a non-native partner of different origin. As in the previous analysis, our results show that the stronger the home-country cultural proxy, the less likely is the category of living without a partner. The magnitude of the cultural effect is greater in same-origin couples than in different-origin couples (native or non-native), although there are no statistically significant differences. All the empirical evidence presented here provides additional support for the existence of a living-together cultural effect.

4.5 The mechanisms through which culture operates

To provide supplemental evidence that we are capturing the effect of culture, the exploration of the possible transmission of culture, and how culture may operate, can be useful. It could be suggested that culture has no effect on the decisions of couples, because immigrants simply reproduce their own parents' behavior, living together if they live with a partner, and not living together if their parents do not do that. To tackle this point, we would have liked to control for whether the immigrant's parents were living together, but this information is not available in the ACS data.[34] We can analyze whether culture has been transmitted horizontally, through neighbors, friends, or the ethnic communities in which immigrants live, but not the vertical transmission of culture; that is, the transmission of culture through parents, grandparents, or other ancestors. Local communities can sustain culture either by providing role models for acceptable family actions, or by punishing conduct outside the norm (Fernández and Fogli 2009). In this framework, we can study whether immigrants are sensitive to the ethnic communities. As Furtado et al. (2013) suggest, the stronger relationship between the cultural proxy and the decision to live together in predominantly same-ethnic communities, may be interpreted as empirical evidence that culture is horizontally transmitted. Following Bertrand et al. (2000), we consider the possible existence of network effects with this model:

$$Y_{ijtk} = \beta_0 + \beta_1 P_{jk} + \beta_2 P_{jk} * HCLT_j + X_{ijtk}\beta_3 + \delta_k + \gamma_j + \theta_t + \varepsilon_{ijtk} \qquad (3)$$

where P_{jk} is the proportion of immigrants from the same country of origin j in each metropolitan area k, γ_j represents the country of origin fixed effects, and ε_{ijtk} is the error term. The remaining variables are as defined above. The country of origin fixed effects capture any unobservable determinant of couple's behavior that varies by home country. Our variable of interest is the interaction between ethnic concentration and the home-country proportion of immigrants living with a partner (as married or unmarried couples). If there is a horizontal transmission of culture, an increase in the concentration of same-ethnicity individuals should increase the probability of living with a married or unmarried partner, more for immigrants originating from countries with a high proportion of couples living together than for those from countries with a low proportion of couples living together (as married or unmarried couples). Then, we would expect β_2 to be positive.

Table 8 presents our results. As seen in the first column, the coefficient capturing the effect of ethnic concentration is not statistically significant (see column 1). The same occurs after adding the cultural proxy in column 2. The estimated coefficient on the HCLT remains similar. It is positive and statistically significant in column 2. The interaction between both variables (the ethnic concentration and the HCLT) is introduced in column 3. In that case, the coefficient on the ethnic concentration is negative and statistically significant, and the interaction term is positive and statistically significant, which may indicate that, depending on the HCLT level, the effect of the ethnic concentration varies from positive to negative. The results indicate that an increase of 10 percentage points in the concentration of immigrants from Jamaica, for example, leads to a decrease of 0.11 in the probability of living with a partner

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[34] There is no information on parents' characteristics.

Table 8 The mechanisms through which culture operates

Dependent variable: live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Proportion of immigrants of the same origin by MSA	−0.032 (0.107)	0.031 (0.099)	−1.735** (0.700)				
HCLT		0.374*** (0.094)				0.452*** (0.085)	0.434** (0.187)
Proportion of immigrants of the same origin by MSA × HCLT			2.291*** (0.840)				
Proportion of natives by MSA				−1.189 (1.141)			
Proportion of natives by MSA × HCLT				2.511 (1.543)			
Proportion of immigrant elders of the same origin by MSA					−12.685*** (4.576)		
Proportion of immigrant elders of the same origin by MSA × HCLT					16.694*** (5.738)		
No pronoun drop						0.040 (0.075)	
No pronoun drop × HCLT						−0.114 (0.088)	
Gender-based system							0.016 (0.206)
Gender-based system × HCLT							−0.042 (0.217)
Male	0.085*** (0.012)	0.084*** (0.012)	0.085*** (0.012)	0.085*** (0.012)	0.085*** (0.012)	0.081*** (0.013)	0.081*** (0.013)
White	0.021* (0.011)	0.019* (0.011)	0.020* (0.011)	0.021* (0.011)	0.021* (0.011)	0.030*** (0.011)	0.030*** (0.010)
Black	−0.157*** (0.025)	−0.155*** (0.025)	−0.159*** (0.024)	−0.153*** (0.025)	−0.158*** (0.024)	−0.148*** (0.020)	−0.147*** (0.020)

Table 8 continued

Dependent variable: live together as married or unmarried couples	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Asian	0.005	0.006	0.003	0.009	0.003	0.003	0.011
	(0.035)	(0.035)	(0.035)	(0.035)	(0.036)	(0.036)	(0.035)
Age	0.077***	0.052***	0.073***	0.068***	0.074***	0.060***	0.057***
	(0.014)	(0.013)	(0.014)	(0.013)	(0.014)	(0.011)	(0.011)
Age^2/100	−0.093***	−0.064***	−0.088***	−0.082***	−0.089***	−0.075***	−0.071***
	(0.020)	(0.019)	(0.020)	(0.019)	(0.020)	(0.016)	(0.016)
High school graduate	0.027	0.039*	0.035	0.030	0.033	0.039*	0.030
	(0.021)	(0.020)	(0.023)	(0.021)	(0.022)	(0.020)	(0.019)
Some college	−0.006	0.032	0.012	0.005	0.007	0.039	0.027
	(0.037)	(0.031)	(0.038)	(0.033)	(0.036)	(0.031)	(0.032)
More college	0.048	0.079**	0.063	0.058*	0.059	0.086**	0.074**
	(0.038)	(0.033)	(0.039)	(0.034)	(0.038)	(0.032)	(0.032)
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
P-value (F-test of HCLT + No pronoun drop × HCLT = 0)						0.0011	0.0002
P-value (F-test of HCLT + Sex-based gender system × HCLT = 0)							
Observations	7052	7052	7052	7052	7052	7052	6853
R^2	0.086	0.091	0.087	0.087	0.087	0.123	0.123

The home-country cultural proxy has been calculated by country of origin, age group, and education level in all estimations. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level

(married or unmarried) for Jamaicans in the US (the home-country proportion of couples living together in Jamaica is 0.28). However, the same 10 percentage-point increase in the concentration of Iranians results in a 0.04 increase in the probability of living with a married or unmarried partner for Iranian immigrants (the home-country proportion of couples living together in Iran is 0.93). According to this finding, only for those immigrants originating from countries where the proportion of couples living together is greater than 0.76, is it found that an increase in the concentration of individuals of the same ethnic community appears to increase the probability of living with a partner (married or unmarried). In addition, the higher the home-country proportion, the greater is the increase. For the rest, an increase in the concentration of individuals of the same ethnic community appears to decrease the probability of living with a partner (married or unmarried). These results appear to suggest the existence of a horizontal transmission of culture. We observe that, for high levels of HCLT, immigrants are sensitive to the behavior of their ethnic communities, increasing the probability of living with a partner. However, for low levels of HCLT, the concentration of same-ethnic individuals clearly discourages immigrants from choosing to live with a partner.

Similarly, we extend our work to the study of the possible assimilation process of US culture. Although this is a tricky issue, and there is an extensive literature focusing on the assimilation process, we simply examine whether the immigrant's sensitivities to their home-country culture differ depending on whether they live in predominantly native communities.[35] No effect can be discerned in this case, since both the native concentration and the interaction between the native concentration and the HCLT are not statistically significant (see column 4). This result suggests that the cultural effect does not vary depending on the native concentration of individuals.

In addition to the immigrant's parents' influence, elder individuals of the same ethnicity may instill in our sample of immigrants a family pattern. Many societies are characterized by the importance of respecting older individuals, and parents lay a great deal of emphasis on their parenting practices, on family bonds, and on obedience (Jambunathan et al. 2000; Wakil et al. 1981). Thus, here we have another channel through which culture may operate. Taking into account the scarcity of information, we can use the same strategy as before to analyze whether immigrants' sensitivities to the cultural proxy change, depending on whether they live in predominantly older same-ethnicity communities. Results are shown in column 5 of Table 8. The interaction between the HCLT and the ethnic concentration of elders is positive and statistically significant. Results can be interpreted as in the case of the concentration of individuals of the same ethnicity; the coefficient on the proportion of elders of the same origin is negative and statistically significant, whereas that of the interaction term is positive and statistically significant, indicating that the effect of the concentration of same-ethnicity elders varies from positive to negative depending on the HCLT level, which may point to the culture operating through respect for older members of the community. It is worth noting that the concentration of individuals of the same ethnicity and that of elders is not highly correlated (44%),

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[35] The native concentration has been defined as the proportion of native individuals in each metropolitan area.

which may indicate that both the horizontal transmission of culture and the respect for elders may be acting as a mechanism.

The way in which culture operates through may depend on whether the countries of origin belong to individualistic cultures (people tend to have an independent view of themselves) or collectivistic cultures (people are more likely to have an inter-dependent view of themselves). To explore this issue, we follow Tabellini (2008) including in our analysis a variable that captures whether the language spoken by each immigrant makes use of subject pronouns obligatory, or not.[36] Since languages that forbid dropping the first-person pronoun give more emphasis to the individual relative to the social norm (Kashima and Kashima 1998), this linguistic rule can be a signal of individualism or collectivist societies. Results are reported in column 6 of Table 8. For those individuals originating from more individualistic cultures (using the pronouns) it is detected a lower impact of the home country cultural proxy. When the cultural proxy (HCLT) increases by 1 percentage point in individualistic cultures (collectivistic cultures), there is a rise of around 0.338 (0.452) percentage points in the probability that an immigrant reports living with a partner in the US.

Lastly, the gender roles followed by societies may lead to different levels of living-together culture assimilation. To capture traditional gender roles, we follow the proposal of Gay et al. (2018), by controlling whether a language employs a grammatical gender system based on biological gender or not. Information is compiled by linguists in the World Atlas of Language Structures (WALS, Dryer and Haspelmath 2011).[37] We add to our analysis a variable that considers languages with gender-based distinctions, as well as an interaction between this variable and our cultural proxy, in order to examine whether its effect on the probability of living together changes. Strikingly, our estimates suggest that the living-together cultural effect appears to be slightly lower in those cases of gender-based language systems, which is supposed to be a more traditional framework. This result is tricky to interpret, since we focus on the cultural effect on the decision to live together as married or unmarried couples (the less traditional approach). Thus, it is not clear how this channel of transmission of culture operates in this setting. In any case, the rest of the results described in this section provide evidence of some of the channels through which culture may be transmitted and may operate[38].

5 Conclusions

Why is the decision to live together as married or unmarried of such interest? In the literature, economists, sociologists, and other researchers have given many alternative responses to that question, primarily focusing on reproductive reasons (having

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[36] The information on the language spoken by each immigrant is obtained from the ACS. This is used in the estimations presented in columns 6 and 7 of Table 8.

[37] The variation in the sample size is due to the availability of information for the gender-based system in WALS.

[38] Religion as a potential mechanism through which culture may operate is not considered here, since we do not have information on the religious persuasion of the immigrants. In any case, the incorporation of information of the home country relative to the religion presented above does not alter our findings.

children), on children's outcomes, on legal issues, and on economic incentives. Although these various responses are common in the majority of countries, there are still considerable differences across countries in the number of individuals who decide to live with a partner. In addition, living together is not always the best option, since in some cases, individuals – occasionally men, but much more often, women - are trapped in problematic and even violent relationships (Lehrer and Son 2017). Then, we wonder why the numbers of individuals living together vary so much from one country to another. In our work, we show that social norms (culture) may be an important factor in the decision to live together as a married or unmarried couple.

To isolate the effects of culture from those of markets and institutions in determining the individuals' decisions about living with a partner (as married or unmarried), we have followed an epidemiological approach (Fernández 2007). We have based our work on US data on young-arrival immigrants who subsequently grew up under the same laws and institutions. Since immigrants' attitudes are probably similar to the preferences of their parents, forebears, and ethnic communities, we use dissimilarities in the proportion of couples living together by country of origin to document the extent of the impact of culture.

Results show a positive and statistically significant effect of our proxy of culture on the likelihood that an immigrant chooses to live with a partner (married or unmarried). We see our findings as evidence that cross-country variations in laws and institutions cannot entirely explain the observed variations in the proportion of immigrants living with their partners in the US. This is in line with the work of Furtado et al. (2013), who find that culture also appears to be a determinant in divorce decisions. Our estimates are robust to controls for observable and unobservable characteristics by country of origin, to the use of different subsamples, and to the redefinition of the cultural proxy. Empirical evidence also suggests that differences in attitudes regarding unmarried cohabitation do not drive our results. Separately, culture affects both married and unmarried cohabitation, but also other modes of household arrangement, such as living with an adult child, with a grandparent, in a same-gender couple, or variations in family size, among others.

The exploration of the formation of same- or different-origin couples provides supplemental empirical evidence in favor of the effect of culture on the living-together decision. Clearly, the greater the home-country proportion of individuals living together, the more likely are the immigrants from that country of origin to choose living together as married or unmarried couples, regardless of their partners' ethnicity. This is interesting for the literature that uses ethnic intermarriage as a measure of intergenerational assimilation rates of immigrants, (Card et al. 2000; Furtado 2015) since our estimates suggest that parents' preferences relative to the choice of living without a partner can also be transmitted to their children, which in turn raises doubts about the utilization of ethnic intermarriage as a proxy of intergenerational assimilation.

The ways in which culture is transmitted and operates have also been explored. We provide additional evidence to reinforce the notion that our estimates are capturing the effects of culture. Because of data restrictions, we can only examine the horizontal transmission of culture. Results appear to reveal a marked sensitivity of immigrants to the behavior of their communities, and in this way, our findings provide evidence that culture plays an important role in couples' decisions. Other possible mechanisms

through which culture may be operating have been considered. We find evidence of a plausible respect-for-elders channel, since immigrants appear to be sensitive to a concentration of elders of the same ethnicity. Results also point to possible differences in the transmission of culture in individualistic and collectivistic societies.

6 Appendix

Table 9-11

Table 9 The effect of culture on the living-together decision using Probit Models

Dependent variable: live together as married or unmarried couples	(1)	(2)	(3)
Home-country proportion of individuals living together	0.379***	1.154***	0.996***
	(0.111)	(0.381)	(0.250)
Male	0.228***	0.238***	0.235***
	(0.034)	(0.034)	(0.034)
White	0.002	0.058*	0.053*
	(0.043)	(0.030)	(0.030)
Black	−0.520***	−0.404***	−0.419***
	(0.050)	(0.068)	(0.071)
Asian	−0.183***	0.019	0.019
	(0.049)	(0.100)	(0.099)
Age	0.168***	0.137***	0.147***
	(0.028)	(0.022)	(0.038)
Age^2/100	−0.205***	−0.166***	−0.183***
	(0.034)	(0.029)	(0.053)
High school graduate	0.046	0.081	0.107**
	(0.050)	(0.056)	(0.055)
Some college	−0.083	−0.017	0.083
	(0.080)	(0.098)	(0.084)
More college	0.037	0.138	0.219**
	(0.087)	(0.103)	(0.089)
Observations	7052	7052	7052

The home-country proportion of individuals living together as married and unmarried couples is calculated using information from the IPUMS International. The American Community Survey 2015 sample, consists of immigrants aged 18 to 50 who arrived in the US at or before the age of 5 and who report a country of origin. In the first column, the home-country cultural proxy has been calculated by country of origin. The second column incorporates the cultural proxy measured by country of origin and age group. In the third column, our variable of interest has been calculated by country of origin, age group, and education level. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 10 More robustness checks and Placebo tests

Dependent variable	(1) Live together as married or unmarried couples	(2) Live together as married or unmarried couples	(3) Live together as married or unmarried couples	(4) Having some college or more college studies	(5) Live together as married or unmarried couples
Home-country cultural proxy	0.365***	0.374***	0.346***	−0.263	0.326***
	(0.098)	(0.100)	(0.092)	(0.223)	(0.065)
Male	0.078***	0.085***	0.083***	−0.003	0.090***
	(0.015)	(0.012)	(0.012)	(0.010)	(0.013)
White	0.023**	0.028***	0.023**	0.150***	0.015
	(0.010)	(0.007)	(0.011)	(0.043)	(0.010)
Black	−0.137***	−0.147***	−0.155***	0.218***	−0.159***
	(0.029)	(0.027)	(0.027)	(0.057)	(0.019)
Asian	0.029	0.004	0.013	0.411***	−0.0004
	(0.041)	(0.030)	(0.034)	(0.062)	(0.018)
Age	0.051***	0.052***	0.056***	0.031*	0.028***
	(0.014)	(0.012)	(0.013)	(0.016)	(0.008)
Age^2/100	−0.064***	−0.063***	−0.069***	−0.054**	−0.033***
	(0.019)	(0.017)	(0.019)	(0.020)	(0.010)
High school graduate	0.038*	0.047***			0.019
	(0.019)	(0.015)			(0.013)
Some college	0.024	0.033			0.013
	(0.030)	(0.024)			(0.017)
More college	0.074**	0.072**			0.046*
	(0.032)	(0.027)			(0.023)
State fixed effects	Yes	Yes	Yes	Yes	Yes
Country of origin fixed effects	Yes	Yes	Yes	No	Yes
Year of immigration fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	7415	8874	7052	7052	40,882
R^2	0.088	0.088	0.089	0.110	0.061

The home-country cultural proxy has been calculated by country of origin, age group, and education level in the rest of estimations. Column 1 includes mixed race immigrants. Our sample has been enlarged in the second column where we include those individuals who arrive to the U.S at or before the age of 7. Controls for education have been excluded in column 3. In column 5, the sample is obtained from the American Community Survey 2010–2015 sample. Estimates are weighted. Robust standard errors, clustered by country of origin, are in parentheses. *** Significant at the 1% level, ** Significant at the 5% level, * Significant at the 10% level.

Table 11 Home-country censuses from IPUMS international

Country	Year IPUMSI
Argentina	2001
Armenia	2011
Brazil	2010
Canada	2011
Chile	2002
China	2000
Colombia	2005
Costa Rica	2011
Cuba	2002
Dominican Republic	2010
Ecuador	2010
El Salvador	2007
France	2011
Germany	1970
Greece	2011
Haiti	2003
India	2009
Iran	2011
Iraq	1997
Italy	2001
Jamaica	2001
Mexico	2015
Netherlands	2001
Nicaragua	2005
Pakistan	1998
Panama	2010
Peru	2007
Philippines	2000
Poland	2002
Portugal	2011
Romania	2011
Spain	2001
Thailand	2000
Trinidad and Tobago	2011
Turkey	2000
United Kingdom	2001
Venezuela	2001
Vietnam	2009

This table shows the Censuses of the countries of origin utilized to calculate the cultural proxies

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