Social Norms and Teenage Smoking: The Dark Side of Gender Equality

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Abstract

This paper is the first to provide evidence that cultural attitudes towards gender equality affect behaviors with potentially adverse health consequences for female, but not for male, teenagers. Namely, descending from more gender-equal societies makes girls relatively more prone to smoke than boys. Using data from over 6,000 second-generation immigrant teenagers sharing culture and institutions from one host country but coming from 45 different countries of ancestry, we find that the higher the degree of gender equality in the country of ancestry, the higher the likelihood that immigrant girls smoke relative to boys, even *after* we control for parental, sibling, and peer smoking. Importantly, we uncover similar patterns when analyzing other risky behaviors such as drinking, getting drunk, smoking marijuana, or getting into fights. This reinforces the idea that more gender-equal social norms may come at an extra cost to women's health, as they increasingly engage in risky behaviors (beyond smoking) traditionally more prevalent among men.

Keywords: culture and institutions; smoking; risky behaviors; gender equality; gender gap index.
JEL Codes: I10, I12, J15, J16, Z13

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1. Introduction

Although smoking is more prevalent among men, women in many countries are catching up, raising concerns of a future epidemic of tobacco use among women. According to the World Health Organization, about 200,000 million of the 1 billion smokers are women (WHO, 2010). The female-to-male smoking prevalence ratio varies widely across countries (Guindon and Boisclair, 2003; and Payne, 2005). In high-income countries, women smoke as much as men (WHO, 2008). In contrast, in low- and middle-income countries, women smoke much less than their male counterparts. However, women's smoking prevalence rates are expected to rise faster than those of men. The reason is that more than three quarters of smokers begin smoking before their 19th birthday (Gruber, 2001b), and smoking take-up rates among girls and boys around the world are converging (Warren *et al.*, 2006) and, in some countries, girls already smoke more than boys (such as, in Bulgaria or Spain).[1] According to Mackay and Amos (2003), the smoking rate among women around the world is estimated to rise to 20 percent by 2025 (up from 9 percent in 2010), while that of men is estimated to decrease. With 5 million people dying every year from tobacco use (1.5 of which are women), the rising epidemic of tobacco use among women begs for a better understanding of the gender differences in smoking as urgent action is needed to prevent tobacco from killing up to 2.5 million women by 2030 (WHO, 2010). The issue is particularly pressing among adolescents as youth smoking causes smoking later in life (Gruber, 2001a).[2]

While many studies analyze the determinants of smoking and the effects of tobacco control policies,[3] the research aiming to explain gender differences in smoking is scarcer and focuses on adult or young adult populations (as opposed to adolescents).[4] To the best of our knowledge two studies focus on the gender

[1] See Baska *et al.* (2009) for Bulgaria, and current paper for Spain.
[2] Importantly, studies based on more recent data have confirmed that previous smoking behavior is a relevant causal contributor to smoking persistence even after accounting for individual observed and unobserved heterogeneity both among teenagers (Gilleskie and Strumpf, 2005) and among adults (Christelis and Sanz-de-Galdeano, 2011).
[3] See, for example, Chaloupka and Wechsler (1997), Gruber and Zinman (2000), Gruber (2001b), Colman, Grossman and Joyce (2003), Adda and Cornaglia (2006, 2010) and the references therein.
[4] The literature has focused on describing gender adult differential prevalence in smoking around the world (Ezzati and Lopez, 2003; WHO, 1992). Branstetter *et al.* (2012) are among the few exploring gender differences in smoking and cessation among teenagers using a sample of 755

differential determinants of adult smoking using individual data (Bauer, Göhlmann, and Sinning, 2007; and Chung, Lim, and Lee, 2010). Both studies find that most gender differences in smoking are due to gender behavioral differences (Bauer, Göhlmann, and Sinning, 2007) or differences in "inclination to smoke" (Chung, Lim, and Lee, 2010), as opposed to gender differences in socio-demographic characteristics.[5]

Most aggregate-data studies have focused on identifying which factors are associated with cross-country variation in the female-to-male smoking ratio (Pampel, 2001 and 2006; Shaap *et al*., 2009; Hitchman and Fong, 2011; French *et al.*, 2013).[6] Nonetheless, all of these studies capture correlations, rather than causal inference. Moreover, aggregate-data studies focus on the effects of variation in *formal* institutional constraints, such as the countries' labor market institutions, use of excise taxation, smoking restrictions (including those on youth), clean-air regulations, cigarettes' prices and production;[7] as opposed to the effects of differences in *informal* institutional constraints or culture,[8] defined as "beliefs and preferences that vary systematically across groups of individuals separated by space (either geographic or social) or time" (Fernández, 2008). The objective of the current paper is to understand the role of informal institutional constraints (culture or social norms) apart from environmental factors (or formal economic and institutional constraints) in explaining gender differences in smoking among adolescents.

While others have found that culture affects economic behavior (as discussed in Guiso, Sapienza and Zingales, 2006, and below), this paper is the first to provide evidence that cultural attitudes towards gender equality

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adolescents seeking to quit smoking in the US. However, these authors do not analyze the effect of gender social norms on youths' smoking and cessation decisions.

[5] Bauer, Göhlmann, and Sinning (2007) use a German survey containing over 20,000 individuals in 1998, 2002, and 2004, while Chung, Lim, and Lee (2010) focus on a cross-sectional survey with over 15,000 Koreans in 2001 and 2005. Neither of these two studies analyze the effects of social gender norms on smoking.

[6] While Hitchman and Fong (2011) find that gender political empowerment is correlated with the gender smoking ratio, earlier cross-sectional studies did not find evidence that greater gender equality reduced the smoking gender gap (Pampel, 2001, 2006; and Shaap *et al*., 2009).

[7] A related literature using individual data examines gender differences in response to anti-smoking policies (Townsend, Roderick, and Cooper, 1994; and Chaloupka and Paccula 1999), or gender differences to price or income elasticities (Townsend, Roderick, and Cooper, 1994; and Chaloupka and Paccula 1999; Hersch 2000; and Yen, 2005).

[8] Note that there is no commonly agreed upon definition of culture. See Fernández (2008, 2011) and the references therein for a more detailed discussion of the meaning of culture in the context of the literature on economics and culture.

affect behaviors with potentially adverse health consequences for female teenagers, but not for male teenagers. In particular, we show that descending from more gender-equal societies makes girls relatively more prone than boys to smoke and engage in other risky behaviors such as drinking or smoking marijuana. We also provide evidence of the mechanisms behind the transmission of culture, namely easy access to cigarettes, and parental monitoring. While earlier research showed that gender social norms improved teenage girls' math-test performance relative to boys' (Nollenberger, Rodriguez-Planas, and Sevilla, 2016); and reading- and science-tests performance (Nollenberger and Rodriguez-Planas, 2017), to the best of our knowledge there was no evidence, up until now, that gender social norms could adversely affect teenage girls' engagement in smoking and other potentially health-harming risky behaviors relative to those of boys.

For the sake of exposition, suppose that culture did not matter and that *only* formal institutions were relevant in shaping behavior. In that case, girls would choose to smoke more (or *less*) than boys (regardless of beliefs) because they may be systematically targeted by pro-smoking advertising campaigns (National Cancer Institute, 2008; WHO 2009; and Choudhury *et al.*, 2010) and cigarette designs that ease the transition from experimentation to established use (Cummings *et al*., 2002), or systematically ignored by information campaigns about the harms of tobacco products;[9] or they may have *less* disposable income than boys or they may not be part of the dominant social group and, hence, they would have *less* access to a costly, scarce, or technologically innovative good, such as cigarettes.[10,11]

[9] The WHO explains that tobacco advertising increasingly targets girls. The theme for World No Tobacco day in 2010 was "Gender and Tobacco with an emphasis on marketing to women", according to Haglund (2010).

[10] See Gruber and Zinman (2000) for a literature review on youth smoking responsiveness to prices of cigarettes.

[11] The literature on the diffusion of innovations establishes that the high-status persons adopt the innovative product earlier (Rogers, 1995; and Strand and Soule 1998). Ferrence (1989) shows that the diffusion of manufactured cigarettes has followed this status-based diffusion pattern. To the extent that women are the less dominant group (relative to men), their adoption of cigarette smoking follows that of men. While the diffusion hypothesis needs a minimum threshold of female independence for the widespread adoption of cigarette smoking to begin, it does *not* need change in gender equality to explain the declining sex difference in smoking patterns. Instead, the decline in the gender smoking gap is one of the stages of the diffusion of cigarette use (Pampel, 2003).

Alternatively, if only culture mattered, girls' higher (or lower) smoking would be the result of having internalized certain beliefs and values related to gender identity, which may affect: (1) a girl's *beliefs* on smoking—while in relatively modern societies these beliefs may be of the type: "as I am a girl, smoking makes me liberated, carefree, modern, unconventional, emancipated, or independent";[12] in more traditional societies, it may be the opposite: "as I am a girl, smoking makes me inappropriate or unfeminine";[13] (2) a girl's beliefs on the institutional constraints she may face—"as I am a girl, smoking will make others perceive me as more male-like and hence confident, assertive, professional, and successful in the labor market; or more glamorous, sophisticated, sociable, attractive, or slim, and, hence, more attractive in the marriage market";[14] or (3) a girl's beliefs on the stage in the diffusion of innovation (cigarettes, in this case) or the smoking epidemic she is in—which is not the actual stage in the host country, but that of her parents' country of ancestry—"as I am a girl, my parents' beliefs on the stage of the diffusion of cigarettes or the epidemic they are in will make it easier for me to smoke either because I have easier access to cigarettes or because my parents are more lenient and give me more freedom to engage in smoking".[15]

Evidence that institutions matter would suggest that, since smoking rates are projected to rise more for women than men, health authorities ought to become increasingly sensitive to gender when formulating and implementing tobacco control policies by, for instance, making sure that information campaigns as well as other smoking prevention and reduction initiatives reach at least as many women as men. Alternatively, evidence that culture matters would suggest that, with gender equality, women also engage in more traditionally male activities that may be harmful to their health. Hence, as gender equality increases, governments would need to consider implementing gender-tailored smoking reduction and

[12] See Nathanson (1995) and Waldron (1991) for examples of such type of arguments.
[13] As explained by Kaplan, Carriker, Waldron (1990); Waldron *et al.* (1988) in their ethnographic studies. See also Waldron (1991).
[14] Note that in this case we are referring to a girl's beliefs on the institutional constraints she may face, which are not the host country's institutional constraints since those will be held constant by means of our methodological approach, but those of her parents' country of ancestry. Hence, even if expected institutional constraints are driven by actual constraints in the country of ancestry, it is still a story about beliefs transmitted through parents or parents' peers.
[15] Note that even if the smoking epidemic or diffusion hypothesis holds in the country of ancestry, findings from second-generation immigrants would still be a story about beliefs.

cessation interventions, as well as promoting healthy behaviors for both men and women more generally. Crucially, understanding the role of *informal* institutional constraints is fundamental to guide policy making on modifying *formal* institutions (as explained by North, 1990).

We analyze the smoking behavior of over 6,000 second-generation immigrant 15- to 18-year old girls and boys coming from 45 different countries of ancestry and living in Spain.[16] By focusing on second-generation immigrants living in the same host country, we are holding constant the host country's formal institutions (namely, economic institutions, rules and regulations regarding tobacco use, distribution, and advertisement, as well as the costs and taxes of tobacco products or the stage in the diffusion of cigarette the host country is in).[17] Thus, if *only* current *formal* institutional constraints or the stage in the epidemic or diffusion of cigarette in the host country determine gender differences in smoking, country-of-ancestry gender differences in smoking prevalence should *not* matter, after controlling for individuals' socio-demographic and family characteristics. Evidence that country-of-ancestry female-to-male smoking prevalence ratio or country-of-ancestry gender equality indices affect second-generation-immigrant girls' host-country likelihood of smoking relative to that of their male counterparts would provide strong evidence that cultural values (such as social norms and customs regarding gender smoking habits, or gender social norms, more generally) affect the smoking gender gap.

We merge data from a nationally representative cross-sectional survey of substance abuse among high-school students in Spain in 2006, 2008, 2010 and 2012 (*Encuesta Estatal sobre Uso de Drogas en Enseñanzas Secundarias*, ESTUDES hereafter) with country-of-ancestry data from several sources (as explained in the data section), and show that the higher the female-to-male smoking prevalence ratio in the country of ancestry, the higher the likelihood of smoking among second-generation immigrant girls relative to boys in the host country. Our results suggest that social norms regarding gender smoking habits matter in determining second-generation immigrants' smoking likelihood in the host country. More precisely, a one-standard increase in the country-of-ancestry

[16] In this paper, second-generation immigrants are defined as individuals born in the country they live in to parents (at least one of them) born in a different country.
[17] We call Spain the "host" country because it is the host country their parents immigrated to.

female-to-male smoking prevalence ratio is associated with a 4.6 percentage points higher likelihood of smoking among girls relative to boys in Spain, the equivalent to an 84 percent increase (as, on average, the likelihood of smoking in Spain among second-generation girls is 5.5 percentage points higher than that of boys). This estimate is statistically significant at the 1 percent level.

We then estimate whether cultural attitudes towards gender equality matter in determining second-generation immigrants' gender smoking gap in the host country, using the World Economic Forum's gender gap index (GGI, hereafter), which reflects economic and political opportunities, education and well-being for women in the country of ancestry.[18] We find strong evidence that social norms regarding the degree of gender equality in the country of ancestry affect the relative likelihood of smoking of second-generation girls relative to boys in the host country. In particular, we find that a one standard deviation increase in the country of ancestry's GGI is associated with a higher likelihood of smoking among second-generation immigrant girls relative to boys in Spain that ranges between 2.4 and 3.9 percentage points (or between 44 and 71 percent) depending on the specification. This effect is statistically significant at the 1 percent level.

Our results are robust to different specifications, alternative measures of gender social norms, the inclusion of additional country-of-ancestry controls, geographic sorting into the host country, and changes in sample criteria. Additionally, the effect of gender social norms on the smoking gender gap remains even *after* we control for a large set of youth and parental characteristics, as well as parental, sibling, and peer smoking. While some of these variables may present endogeneity issues (and hence we do not include them all in our preferred specification), the fact that our main results are robust to their inclusion is nonetheless reassuring. Importantly, we also find that our result for smoking extends to other risky behaviors, namely drinking alcohol, getting drunk, smoking marijuana or getting into fights, suggesting that the importance of culture expands beyond the decision to smoke. Last but not least, we performed falsification tests to assess whether our results are spuriously picking up the effect of unobserved

[18] The GGI is the same index used by Guiso *et al.* (2008), Fryer and Levitt (2010), and Nollenberger, Rodríguez-Planas, and Sevilla (2016), and Nollenberger, Rodríguez-Planas (2017), who analyze the effect of gender equality on the gender gaps in math, reading, and science test scores.

confounders at the country-of-ancestry level or merely due to chance. Our placebo estimations suggest that this is not the case as when we use placebo values for our cultural proxies (rather than their true values) we only find statistically significant results in less than 1% of the cases.

Subgroup analyses reveal that the effect is driven by those with mothers who did not reach high-school. We also find that, while having siblings and peers who smoke reinforces the effect of culture, gender social norms affect the smoking gender gap even among those whose siblings or peers do not smoke. Interestingly, we find no evidence that maternal employment or family structure affect the transmission of beliefs.

We then explore whether social norms also affect the perceived risks of smoking, the information received on the harms of drugs, or parental supervision. We find that girls whose parents come from more gender-equal countries are more likely to have easy access to cigarettes, and have less parental supervision in general than their male counterparts. This evidence is suggestive that beliefs are transmitted at least in the following two ways: parental monitoring and easy access to cigarettes, providing support for the hypothesis that beliefs on the stage of the diffusion of cigarettes or the epidemic the girl is in—which is not the *actual* stage in the host country, but that of her parents' country of ancestry—are being transmitted.

Other authors have used a similar approach to estimate the effects of culture on different socio-economic outcomes, including savings rates (Carroll, Rhee, and Rhee 1994); stock market participation (Osili and Paulson, 2008); preferences for redistribution (Luttmer and Singhal, 2011); fertility and female labor force participation (Antecol 2000; Fernández and Fogli 2006, 2009; Fernández 2007); living arrangements (Giuliano 2007); the demand for social insurance (Eugster et al. 2011); preferences for a child's sex (Almond, Edlund, and Milligan 2013); divorce (Furtado, Marcén, and Sevilla 2013); and gender gaps in math test scores (Nollenberger, Rodríguez-Planas, and Sevilla, 2016). Using a complementary approach, Christopoulou and Lillard (2015) find that culture affects the smoking behavior of British immigrants' descendants living in Australia and the US. However, Christopoulou and Lillard (2015) do not investigate whether culture and/or cultural attitudes towards gender affect smoking behavior differently for men and women, as we do. Polavieja (2015)

uses an alternative approach to explore the effect of culture on fertility by imputing traits from the non-migrant population of the country of origin to the migrant population. Using a sample of adult (18- to 65-year olds) immigrant smokers in the US, Leung (2014) finds that, at arrival, a higher prevalence of smoking in the country of origin increases the likelihood of being a smoker in the US, and that this effect fades with time in the country. In contrast, Leung (2014) finds that a lower prevalence of smoking in the country of origin decreases the likelihood of being a smoker at arrival, but these immigrants' odds of smoking increases with time in the US. While Leung (2014) finds a diverging pattern across genders with time in the US, gender convergence in her dataset is explained by the fact that most immigrant men in her sample are from countries with higher male smoking rates than in the US, while the opposite is true for women. In contrast, we show that there is an intergenerational transmission of *gender* social norms affecting differentially boys and girls born and raised in the same province in the host countries.

The remainder of this paper is organized as follows. Sections 2 and 3 describe the empirical strategy, the Spanish institutional background and the data. Section 4 presents estimates of the effects of social norms and customs regarding gender smoking habits and gender equality on second-generation immigrant girls' likelihood of smoking relative to that of boys. Section 5 quantifies the effect of culture relative to other well-known determinants affecting youth smoking, and Section 6 presents sensitivity analysis, respectively. Section 7 presents subgroup analysis. Section 8 explores whether social gender norms from the country-of-ancestry also affect other risky behaviors. Section 9 presents results on the effects of culture on gender differences in perceived risk, access to tobacco, information on the risks of drugs, and parental leniency, among others. Section 10 concludes.

2. Empirical Strategy

To examine whether country-of-ancestry social norms affect gender differences in youth smoking, we use a sample of second-generation immigrants aged 15 to 18 years old to estimate equation (1):

$$S_{ijkt} = \alpha_1 female_i + \alpha_2 GE_j + \alpha_3 (female_i * GE_j) + X'_{ijkt}\beta_1 + (X'_{ijkt} * female_i)\beta_2 + \lambda_k + \lambda_t + \varepsilon_{ijkt} \quad (1)$$

where S_{ijkt} is the decision to smoke of individual i from country of ancestry j, and living in province k in survey year t. To identify smoking differences between girls and boys, the variable $female_i$ is an indicator equal to one if the individual is a girl and zero otherwise. GE_j is a variable that proxies gender social norms in the country of ancestry j. The vector X_{ijkt}, includes a set of individual and family characteristics that may affect smoking habits. These individual characteristics are also interacted with the female indicator. λ_k and λ_t are a full set of dummies that control for the individual's host-country province of residence k, and the year of the survey t. Year fixed effects (λ_t) account for cohort differences and other time variation. We include province-of-residence fixed effects (λ_k) to account for the province's characteristics that may be related to smoking habits. Standard errors are clustered at the country-of-ancestry level, which is the source of identification.

Our coefficient of interest is that of the interaction between GE_j and the female indicator, α_3, which captures the role of country-of-ancestry gender social norms in explaining gender differences in smoking of second-generation immigrant girls and boys in the host country. A positive and significant α_3 would suggest that more gender equality in the immigrant's country of ancestry is associated with higher smoking among second-generation immigrant girls relative to boys, and thus a *smaller* smoking gender gap in the host country if the initial gap is negative, but a *greater* gender gap if the initial gap in the host country is non-negative. Equation (1) has been estimated using OLS and, as a robustness check, we have also used nonlinear models (logit and probit) and subsequently computed average partial effects, which confirmed our conclusions based on OLS estimations.

As indicated above, we restrict our sample to second-generation immigrants who were born and reside in the same host country (and therefore, share the same economic and institutional environment) but whose parents were born in another country (such that their social beliefs are potentially different). This way of

disentangling cultural from environmental factors is at the core of the epidemiological approach, which has been thoroughly reviewed by Fernández (2011).

Because second-generation immigrants are born and live in the same area (the host country), using them minimizes their ties with non-immigrating family members, as well as the role of *formal* institutions in the country of ancestry on second-generation immigrants' outcomes. However, as Fernández (2011) points out, parents are not the only transmitters of culture, which will lead to an underestimation of the effect of culture in the specification of equation (1). Moreover, to the extent that our teenagers' parents (who are first-generation immigrants) are acculturated and their beliefs on smoking converge to those of natives in the host country, our estimates of culture will be also be downward biased.[19]

3. Institutional Background and Data

Institutional Background

Tobacco use among women in Spain began in the late 1960s/early 1970s, first among the college educated, and progressively across all education levels and socio-demographic groups. According to the World Bank Database, in the period 2011-2015, as many as 34 percent of Spanish males and 28 percent of Spanish females aged 15 and older smoked. In contrast to the adult population, teenage girls (14 to 18 years old) in Spain are more likely to smoke than their male counterparts. In 2012, 33.1 percent of boys and 37.5 percent of girls aged 14 to 18 years old smoked (Ministerio de Sanidad, 2013).

In Spain, tobacco regulations are set at the national level (that is, they do not vary across regions) and they have been slow to develop. The first tobacco prevention law, passed in 1988, forbade smoking in schools and hospitals. It also set the minimum age to purchase tobacco at 16 years of age. Seventeen years later, on December 26 2005, the law 28/2005 increased the legal age to purchase

[19] Some authors have found evidence of gender differences in acculturation and smoking behavior among first-generation Latinos and Asians in the US (Bethel and Schenker, 2005; Zhang and Wang, 2008; Gorman, Lariscy, and Kaushik, 2014; and Leung, 2014). In these papers, acculturation means that immigrants adapt to the institutions and social norms of the host country, which contrasts with our findings that parents' gender social norms affect differently girls' and boys' smoking decisions and that this cultural transmission persists over time.

tobacco to 18 years of age. In addition, this law also established that all cigarette packages are required to state on the package the minimum legal age to purchase tobacco.

ESTUDES Data

Our main data set uses the cross-sectional survey of substance abuse among 15- to 18-year old high-school students in Spain (*Encuesta Estatal sobre Uso de Drogas en Enseñanzas Secundarias*, ESTUDES hereafter). Although the survey is conducted bi-annually since 1994, data are publicly available to researchers starting in 2004. Our analysis focuses on the 2006 to 2012 waves. We excluded the 2004 wave because it does not contain information on parents' country of birth. The 2012 wave is the latest wave available up to date.

The survey asks youths about smoking habits. Our main outcome variable is the decision to smoke, which takes the value one if the individual reported smoking in the past 30 days, and zero otherwise. In addition to smoking habits, ESTUDES also collects further information on the student, his or her family, and peers, including the student's age, his or her highest educational level achieved, the employment status of his or her mother and father at survey date, and his or her household composition. ESTUDES also contains information on whether the student has fallen behind a grade, whether the student works, and the smoking habits of the students' parents, siblings, friends and school-peers. Appendix Table A.1 presents basic descriptive statistics of all ESTUDES variables used in the analyses.

Country-Level Variables

To proxy gender social norms, we focus on two main country-of-ancestry variables: the female-to-male adult smoking prevalence ratio and the gender gap index (the GGI, hereafter).

The female-to-male adult smoking prevalence ratio is estimated using adult male and female smoking prevalence from the World Bank Indicators (WBI, hereafter). Female (male) smoking prevalence is estimated as the percentage of women (men) aged 15 and over who smoke any form of tobacco, including cigarettes, cigars, pipes or any other smoked tobacco products in 2010. Smoking includes daily, non-daily, or occasional smoking. In addition, for those countries

for which this information was not available in the WBI, the male and female smoking prevalence was obtained from either Nation Master or from Table 2 in Muller and Wehbe (2008) for different years.[20]

The GGI is collected from the 2010 World Economic Forum report, except for two countries, Belarus and Burundi, for which the GGI comes from the 2009 and 2011 World Economic Forum report, respectively, as they were not available in 2010. The GGI measures the relative position of women in a society, ranging between 1 and 0, with larger values indicating a better position of women in society. The GGI takes into account the gap between men and women in four different areas: economic opportunities and participation, educational attainment, political achievements, and health and survival. The index of ***economic participation and opportunity*** is based upon: (1) female labor force participation over male, (2) wage equality between women and men to similar work, (3) female earned income over male, (4) female legislators, senior officials and managers over male, (5) female professional and technical workers over male; the index on ***educational attainment*** is based upon: (1) female literacy rate over male, (2) female net primary level enrolment over male value, (3) female net secondary level enrolment over male, (4) female gross tertiary level enrolment over male value; the index on ***political empowerment*** is based upon: (1) the ratio women to men with seats in parliament, (2) the ratio of women to men in ministerial level, and (3) the ratio of the number of years with a women as head of state to the years with a man; and the index on ***health and survival*** is based upon: (1) the gap between women and men's healthy life expectancy and, (2) the sex ratio at birth, which aims to capture the phenomenon of "missing women". As the GGI, these four indices range from 0 to 1, with larger values indicating a better position of women in society.

In our analysis, we also estimate the effect of these four separate areas of gender equality on the gender smoking gap in order to assess which formal

[20] From Muller and Wehbe (2008), we obtained data from Colombia, Guatemala, Nicaragua, Peru and Venezuela. As explained in the notes of their table, Guatemala and Venezuela data come from PATIOS online database (Organización Panamericana de la Salud 2005); Colombia and Peru data come from the 2nd edition of The Tobacco Atlas of the American Cancer Society (Mackay, Eriksen, Shafey, 2006), Central American Diabetes Initiative (Organización Panamericana de la Salud, 2003); and Nicaragua data come from Central American Diabetes Initiative (Organización Panamericana de la Salud, 2003). From Nation Master (http://www.nationmaster.com/), we obtained data from Algeria (2003), Gambia (1997), and Syria (1999).

institutions in the country of ancestry affect inter-generational transmitted beliefs. To simplify comparison of estimates across specifications using alternative measures of gender equality, *all* of our country-of-ancestry variables are standardized such that they have a mean of 0 and a standard deviation of 1.

Our main cultural measures (the GGI and the female-to-male prevalence ratio) are not readily available on a yearly basis and in a comparable fashion for the countries of ancestry in our sample. Hence, both youths' outcomes and the country-of-ancestry cultural indicators are measured broadly contemporaneously, as it often happens in the epidemiological literature due to similar data limitations (see Giuliano, 2007; Fernández and Fogli, 2009; Furtado, Marcen and Sevilla, 2013; and Nollenberger, Rodriguez-Planas, Sevilla, 2016; among others). However, as Fernández and Fogli (2009) remark, the ideal date from which to take these data is far from obvious. On the one hand, it could be argued that cultural indicators measured at the time of migration to the host country may best reflect how our second-generation teenagers' parents experienced their countries of origin's cultural values. Note that, even if we had long time series for our cultural proxies, information on parents' tenure in the host country is not available in our survey. On the other hand, and to the extent that immigrants may keep in touch with their friends and relatives in their home countries, it could also be argued that our second-generation youths' parents transmit the social norms of their contemporaneous country-of-origin counterparts.

Perhaps most importantly, we could not think of a plausible scenario in which the fact that our cultural proxies may be measured with error because of their timing would lead to an overestimation of the impact of culture rather than leading to attenuation bias.

Sample of Second-Generation Immigrants and Descriptive Statistics

To implement the empirical strategy described in Section 2, we restrict our ESTUDES sample to second-generation immigrants who were born and reside in Spain but whose parents (at least one of them) were born in another country.

Because identification comes from variation in our measures of parental country-of-origin culture, we pool the 2006, 2009, 2010 and 2012 ESTUDES waves to maximize the number of countries of ancestry. If both parents are immigrants, we use the cultural indicators corresponding to the mother's country

of origin because previous evidence indicates that mother's culture is more relevant for girls than father's culture (Blau *et al.*, 2013 and Christopoulou and Lillard, 2015), while mothers' and fathers' culture matter equally for boys (Christopoulou and Lillard, 2015).[21] If mother's country of origin is unavailable, or she was born in Spain, we use the father's country of origin.

When using the female-to-male smoking prevalence ratio as a proxy for culture, we restrict our sample to those individuals for whom we observe this variable in their country of ancestry.[22] Analogously, when using the GGI as a proxy for culture, we restrict our sample to those individuals for whom we observe this variable in their country of ancestry.[23] We also drop second-generation immigrants whose country of ancestry has fewer than 10 observations in a given host country.[24] In the robustness section, we explore the sensitivity of our results to changes in sample selection criteria.

Our final sample has over 6,000 second-generation migrants from 45 different countries of ancestry (as shown in Table 1). Countries of ancestry are from various continents and levels of development. Indeed, the countries of ancestry in our sample cover all continents, with many European (14 countries) and some transition economies (Poland, Romania, and Russia), several countries in America (Bolivia, Canada, Chile, Colombia, Cuba, Dominican Republic, Ecuador, El Salvador, Mexico, Peru, United States, Uruguay, and Venezuela), some in Asia (China, India, Japan, and Philippines), Africa (Algeria, Angola, Gambia, Morocco, Senegal, and South Africa), Middle East (Lebanon, Iran, and

[21] In our sample of second-generation immigrants, when both their parents come from a foreign country, in 82% of the cases they come from the same foreign country.

[22] The lack of female-to-male smoking ratio implies losing the following ancestry territories: Angola, Bermuda, Chad, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gibraltar, Guinea-Bissau, Guyana, Democratic People's Republic of Korea, Libya, Liechtenstein, Madagascar, Mayotte, Monaco, New Caledonia, West Bank and Gaza, Sao Tome and Principe, Taiwan, Timor-Leste, and Western Sahara.

[23] The lack of gender equality measures implies losing the following ancestry territories: Afghanistan, Andorra, Bermuda, Bosnia and Herzegovina, Burundi, Cabo Verde, Republic of the Congo, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Gabon, Gibraltar, Guinea, Guinea-Bissau, Haiti, Iraq, Republic of Korea, Democratic People's Republic of Liberia, Libya, Liechtenstein, Mayotte, Monaco, New Caledonia, West Bank and Gaza, Puerto Rico, Sao Tome and Principe, Serbia, Sierra Leone, Taiwan, Timor-Leste, Turkmenistan, and Western Sahara.

[24] This is a common practice in the literature. For instance, Fernández and Fogli (2006) eliminate those countries of ancestry with fewer than 10 observations. Given that our regressions are run at the individual level, whether we include these small numbers of observations does not affect our results. With this adjustment, we lose 159 individuals.

Syria) and one country in Oceania (Australia). Countries of ancestry contributing the most to our sample of second-generation immigrants are Morocco, France, Germany and Venezuela (second-generation immigrants whose parents were born in these countries represent 43 percent of the sample).[25]

Table 1 presents summary statistics for our sample of second-generation immigrants by country of ancestry. The first column shows smoking differences in Spain between second-generation immigrant girls and boys by country of ancestry, measured as the difference between the average female smoking prevalence (displayed in Column 2) and the average male smoking prevalence (shown in Column 3). Countries of ancestry are ordered by the magnitude of the gender smoking gap in Spain. Column 1 shows a large variation in the gender smoking gap across countries of ancestry. At the top 10 percent of the smoking gender gap distribution by country of ancestry, second-generation immigrant girls smoke more than boys by 28 percentage points. At the bottom 10 percent of the smoking gender-gap distribution, second-generation immigrant girls smoke substantially less than boys by 34 percentage points. On average, the difference in smoking probabilities between girls and boys in our sample is +5.5 percentage points, indicating that second-generation girls are more likely to smoke than their male counterparts in Spain. This gender difference in smoking prevalence, which is statistically significant at the 1% level, is identical to that of native teens and quite similar to that observed among all youth (including first- and second-generation immigrants *and* natives) living in Spain (see Appendix Table A.2).

Columns 4 to 9 in Table 1 show the value of different gender-equality measures in each country of ancestry. There is considerable dispersion in the female-to-male smoking prevalence ratio across countries of ancestry as it varies from 96.79 percent in Norway to 1.24 percent in Algeria. The variation in the GGI is also far from negligible, as it ranges from 59.3 percent in Syria to 84.0 percent in Norway. The average female-to-male smoking ratio (GGI) across countries averages 56.88 (68.66) percent with a 32.40 (6.08) percent standard deviation.

[25] While Moroccans, Ecuadorians and Romanians represented the three largest nationalities of immigrants in Spain at the turn of the century, Ecuadorians and Romanians only began to immigrate to Spain in large numbers after the turn of the century (Rodriguez-Planas and Vegas, 2014). Hence, it is not surprising that we observe fewer second-generation immigrants from these two countries.

Table 2 displays cross-correlations between the gender smoking gap in Spain and the different measures of gender equality in the country of ancestry. The correlation between the gender smoking gap in Spain and the different measures of gender equality in the country of ancestry ranges between 0.074 (for political empowerment) and 0.277 percent (for gender equality regarding educational attainment). Not surprisingly, Table 2 shows that the cross-correlations between our different country-of-ancestry measures are generally higher; for instance the correlation between the female-to-male smoking prevalence ratio and the GGI is 0.69, while the correlation between the country-of-ancestry female-to-male smoking prevalence ratio and the different components of the GGI varies from 0.34 for the health and survival index to 0.62 for the educational attainment index.

Figure 1 plots the female-to-male smoking ratio of second-generation immigrants in Spain by country of ancestry versus the (non-standardized) GGI in the country of ancestry. Overall, the raw data show that the more gender equality in the country of ancestry the higher the likelihood that second-generation immigrant girls smoke with respect to boys. The regression line has a slope of 3.142 with a standard error of 0.926. The adjusted R^2 is 0.20. Similar results are found when instead of the GGI we use the female-to-male smoking prevalence ratio in the country of ancestry instead as shown in Appendix Figure A.1.

4. Main Results: Does Culture Affect the Youth Smoking Gender Gap?

Baseline Findings and Alternative Measures of Culture

Table 3 displays the estimated coefficient on the interaction between the female indicator and the culture proxy in the country of ancestry, $\hat{\alpha}_3$, from estimating equation 1 using alternative measures of culture. All coefficients are positive and statistically significant at the 5 percent level or lower, highlighting the relevance of gender social norms in the country of ancestry in explaining the gender smoking gap of second-generation immigrants in Spain.

According to estimates in column 1, if a girl's parents, originally from a country with an "average" female-to-male smoking ratio, had instead come from a country with a female-to-male smoking ratio one standard deviation above the mean, the likelihood that she smokes in the host country would have increased by 4.6 percentage points relative to that of a male counterpart, an 84 percent increase

relative to the observed gender smoking gap for immigrants of 5.5 percentage points (see Appendix Table A.2). Similarly, column 2 reveals that if a girl's parents, originally from a country with "average" GGI, had instead come from a country with a GGI one-standard deviation above the mean, her likelihood of smoking relative to a male counterpart would have been 3.9 percentage points higher, representing a 71 percent increase.

An alternative and complementary way to interpret these results follows. Let us take, for instance, the case of second-generation immigrant youths whose country of origin is Morocco, where the female-to-male smoking prevalence ratio and the GGI amount to 4.7 percent and 57.7 percent, respectively. Additionally, the smoking rate of girls from Moroccan ancestry in Spain is 1 percentage point lower than that of their male counterparts. If these youths' parents had come from the US instead, where the female to male smoking prevalence ratio and the GGI amount to 78.6 percent and 74.1 percent, respectively, our statistical model predicts that their gender smoking gap would be approximately 10.5 percentage points larger when considering either the female-to-male smoking prevalence ratio or the GGI as measures of culture.[26] That is, the smoking gender gap among teenagers of Moroccan ancestry would raise from -1 to +9.5 percentage points if the female-to-male smoking ratio of Morocco took the US value instead or if Morocco's GGI reached the US level.

Institutional Channels from the Country of Ancestry Shaping Culture

Because culture and institutions reinforce each other (Alesina and Giuliano, *2015*), columns 3 to 7 in Table 3 explore which institutions in the country of ancestry shape the social norms regarding gender and smoking that end up being transferred to second-generation immigrants. In addition to assessing the sensitivity of our findings to alternative proxies of culture, this exercise enables us to identify which beliefs from the country of ancestry matter the most. Understanding the origin of the smoking gender gap will help design public health

[26] This is calculated as $[Female\ to\ Male\ Smoking\ Ratio_{USA}\ (0.786) - Female\ to\ Male\ Smoking\ Ratio_{Morocco}(0.047) = 0.739]/0.324 * \hat{\alpha}_3(0.046) = 0.1049$ and $[\ GGI_{USA}\ (0.741) - GGI_{Morocco}(0.577) = 0.164]/0.061 * \hat{\alpha}_3(0.039) = 0.1048$. Note that these calculations would not necessarily deliver so similar results in other cases.

interventions that will be more efficient at preventing a potential epidemic of tobacco among women.

Columns 3 to 6 in Table 3 indicate that a one-standard deviation increase in the country-of-ancestry gender equality indices regarding women's educational attainment, economic opportunities, or health and survival is associated with a 4.6, 3.6, or 3.3 percentage points increase in the smoking likelihood of girls relative to boys in the host country, the equivalent to an 83, 65, or 59 percent increase, respectively. These three effects are statistically significant at the 1 percent level. The effect of political empowerment is smaller (a 2.2 percentage points or 40 percent increase). Column 7 re-estimates the model but including the four different GGI components at the same time to explore which of these component is most relevant. In this specification, we observe that beliefs regarding women's educational attainment and health and survival are those that matter the most when explaining the gender differences in teenager smoking.

As Appendix Tables A.3 and A.4 show, our conclusions remain unchanged if we use a probit or a logit model instead of OLS and subsequently compute the average partial effects of the coefficients of interest.

For the sake of brevity, the paper will mostly present results using the GGI as a measure of gender equality. However, we have replicated the analysis below using alternative measures of culture, with similar results (shown in Appendix Table A.5).

5. Other Determinants of Smoking and the Transmission of Culture

In this section we take a closer look at the relationship between gender social norms and the smoking gender gap by using a sequential approach that highlights how our coefficient of interests varies with the inclusion of additional covariates and sheds some light on the mechanisms through which the relationship between gender social norms and the gender smoking gap operates. In particular, we depart from a specification in which we only include a female indicator, year and province fixed effects, and then subsequently add several sets of covariates until we arrive to the baseline specification used in Table 3. Finally, we add further covariates to our baseline specification to assess how our conclusions may be affected.

Before presenting the results of these analyses, it is worth stressing that some of the additional characteristics that we will sequentially include (such as, for instance, parental education and work status as well as parental, siblings and peers' smoking) may well be affected by culture. Therefore, by including them, we are testing whether gender social norms transmitted from parents to children have a direct impact on the smoking gender gap beyond the indirect ways in which they could affect such gap through these variables. In other words, by including some of the controls we will introduce below we are limiting the avenues through which culture is allowed to operate and attempting to restrict them to those gender beliefs or preferences that parents transmit to their children. This is arguably a very demanding test of the relevance of culture.[27] However, it is important to assess the sensitivity of our result to the inclusion of additional variables to the extent that they may capture underlying socioeconomic and behavioral differences across individuals rather than culture.

Column 1 in Table 4, in which we only control for the female indicator, and the year and province fixed effects, reveals that second-generation immigrant girls are, on average, 5.9 percentage points more likely to smoke than their male counterparts within province and year. Since the average smoking rate is 21.5 percent among second-generation boys, this implies that second-generation girls smoke, on average, 27.4 percent more than boys.

Column 2 adds to the specification in Column 1 the GGI and our main variable of interest, its interaction with the female dummy. According to this specification, beliefs regarding gender equality significantly affect the smoking decision of second-generation girls relative to their male counterparts. In particular, a one percentage-point increase in the standard deviation of the GGI in the country of ancestry is associated with a 3.6 percentage point increase in the likelihood that second-generation girls smoke relative to their male counterparts, which represents a 65 percent increase with respect to the raw smoking gender gap of 5.5 percentage points in our sample of second-generation immigrants.

[27] Note also that, as discussed in Section 2, by comparing outcomes across second-generation immigrants whose parents came to the host country from different countries of origin, the epidemiological approach is prone to underestimate the true effect of culture for two additional motives. First, cultural transmission is restricted to parents. Second, assimilation to the host country's culture is likely to weaken the impact of the country of ancestry's culture.

Interestingly, the country-of-ancestry GGI has no effect on the decision to smoke among second-generation boys.

Culture versus Maternal Work Status

Column 3 in Table 4 adds to the specification in Column 2 the age of the teenager at the time of the survey and its square, and his or her mother's and father's highest educational attainment as well as their labor force status. The reason for controlling for parental education and employment is that previous studies have documented a socioeconomic gradient in smoking (Gruber, 2001). We find that both being older and having a working mother increase the likelihood of smoking. In contrast, having a working father is associated with a lower likelihood of smoking. Nonetheless, adding these variables has little effect on our coefficient of interest, $\hat{\alpha}_3$. Indeed, the differential effect of the GGI on the likelihood that second-generation immigrant girls smoke relative to their male counterparts remains positive and statistically significant at the 1 percent level, and the size of the estimated coefficient has even slightly increased from 3.6 to 3.8 percentage points.

Because the socioeconomic gradient in smoking may vary by country and gender (Cavelaars *et al.*, 2000; Fukuda, Nakamura, and Takano, 2005; Huisman, Kunst and Mackenback, 2005; and Laaksonen *et al.*, 2003), Column 4, which corresponds with our benchmark specification presented in Table 3, interacts all the covariates added in Column 3 with the female indicator. Comparing Columns 3 and 4 in Table 4 reveals that none of these interacted variables are statistically significant, suggesting that youths' age and parental education and work status do *not* affect second-generation immigrant girls' and boys' smoking behavior differently in Spain. Only the country-of-ancestry gender equality measure has an effect on smoking that varies by gender and is statistically significantly different from zero.

Other Smoking Determinants

It may be that the results presented so far are capturing other factors (beyond gender social norms transmitted from parents to children) that affect the smoking gender gap.

For instance, it may be that our results are driven by how liquidity constrained teenage girls and boys are. If less liquidity constrained girls (relatively to boys), who may also happen to come from more gender-equal countries, smoke more relative to boys than more liquidity constrained girls (relatively to boys), who may happen to come from less gender-equal countries, failure to control for whether teenagers are cash constrained (and its interaction with the female dummy) may lead us to overestimate the link between gender equality and the smoking gender gap.

Similarly, if girls from less gender-equal countries perform academically worse (relative to their male counterparts) than girls from more gender-equal countries,[28] leading to, say, higher grade retention rates for the former than the latter (relative to their male counterparts), failure to control for grade retention (and its interaction with the female indicator) may lead us to underestimate the effect of gender equality on the smoking gender gap as evidence has shown that lower academic achievement is associated with higher smoking (US Department of Health and Human Services, 2010).

To address these two concerns, Column 5 in Table 4 presents a specification that controls for whether the adolescent works for pay or not, whether the adolescent has been retained a grade, and both of these variables interacted with the female indicator. While we find that both working and having been retained a grade have a positive and statistically significant effect on teenage smoking (regardless of gender), they have no gender differential effect.[29] Most importantly, adding these variables only reduces the size of our coefficient of interest, $\hat{\alpha}_3$, by 0.3 percentage points.

Parental smoking habits[30] and family structure[31] are other potentially relevant smoking determinants that, to the extent that they may be correlated with both the teenagers' gender *and* the degree of gender equality in their countries of ancestry, may affect our results. Column 6 in Table 4 addresses both concerns as

[28] Nollenberger, Rodríguez-Planas, and Sevilla (2016) and Nollenberger, and Rodríguez-Planas (2017) show that, the higher the degree of gender equality in the country of ancestry, the higher the performance of immigrant girls relative to boys in math, and reading and science, respectively.
[29] Note that the coefficients on the interactions are statistically insignificant and their magnitudes are close to zero.
[30] See for instance Loureiro, Sanz-de-Galdeano, and Vuri (2010) and the references therein.
[31] There is evidence that youths from single-parent households are more likely to smoke than those from two-parent households (Du *et al.*, 2015).

it presents results from a specification that controls for whether both parents live in the household, and whether the mother or the father smokes *and* lives in the same household as the teenager. These three variables are also interacted with the female indicator to capture potentially differential effects by gender. As expected, we find that living with both parents reduces the likelihood of smoking, and living with a smoking parent (either the mother or the father) increases the likelihood of smoking, but the effect of these variables does not significantly vary by gender. As $\hat{\alpha}_3 = 0.035$, a one standard-deviation increase in the country-of-ancestry GGI is associated with a relative increase in girls' likelihood to smoke relative to boys of 3.5 percentage points (or 64 percent of the 5.5 percentage point smoking gender gap observed in our sample of second-generation immigrants). Hence, the effect of culture on the smoking gender gap remains important, even after controlling for parental smoking habits and household composition.

Evidence has also shown the importance of peers in teenagers' smoking habits (Burt and Peterson, 1998). The specification shown in Column 7 controls for whether the individual has siblings who smoke in the household and whether the individual reports having seen students smoking in school within the past 30 days (and their interactions with the female indicator). Adding these controls increases $\hat{\alpha}_3$ to 0.036, and it remains statistically significant at the 1 percent level. Our estimates suggest that having siblings who smoke in the household increases youth smoking, but has no gender differential effect. Similarly, seeing students smoke in school increases the odds of smoking, but has no gender differential effect on youth smoking.

Column 8 adds to the specification in column 7 an indicator variable that identifies teenagers who declare that "some, most, or all" of their friends smoke and its interaction with the GGI. Clearly this variable is endogenous and hence it is not surprising that, to the extent that culture affects peers' choices and is not only transmitted by parents but also by peers, it is picking up part of the effect of culture. Nonetheless, even in this specification, we find that $\hat{\alpha}_3$ is positive (at +0.025, which represents a 45% of the smoking gender gap) and statistically significant at the 5 percent level.

As Appendix Table A.5 shows, our conclusions are basically unchanged if we use the female-to-male smoking ratio in the country of ancestry instead of GGI as our measure of gender equality.

6. Potential Threats and Additional Robustness Checks

This section discusses potential threats to our identification strategy and explores the robustness of our results to a battery of additional sensitivity checks, including alternative specifications, changes in sample criteria, and falsification tests

Selective Migration and Geographic Clustering within the Host Country

A common concern with the epidemiological approach is that second-generation immigrants may not be randomly selected. In our context, one may object from the outset and throughout that our teenagers' immigrant parents may not have the preferences/beliefs that are representative of the average in their country of origin. In this context, as other authors have previously remarked,[32] an insignificant coefficient on the parental country-of-origin cultural proxy should not lead one to rule out the importance of culture. On the other hand, the interpretation of significant coefficients (as the ones we actually obtain) on the cultural proxies crucially depends on the issue being studied. However, we could not think of a plausible story such that selective migration would bias our results in favor of culture.

More specifically, in our case, if culture did not matter, our results being driven by selection would require the beliefs of parents from more/less gender-equal countries to be systematically drawn from the opposite extremes of the countries' distributions of beliefs/preferences regarding female versus male smoking. In particular, immigrant parents from more gender-equal countries would need to be disproportionally favorable (as compared to their non-immigrant counterparts) towards women smoking (relative to men) and, in contrast, immigrant parents from less gender-equal countries would need to possess lower than average preferences towards female versus male smoking habits. There is no reason to expect this to be the case.

Another potential concern with the epidemiological approach is that geographic sorting occurs within a given host country such that first-generation immigrants (that is, our teenagers' parents) self-select into certain areas. In our

[32] See for instance Fernández and Fogli (2009) and Fernández (2011).

context, the concern would be that parents who care more about their daughters' success choose to move from countries of origin with low gender-equality culture to regions in Spain with high-gender equality. Notice that this type of selection would bias our culture estimates downward (not upward), such that we would be underestimating the true effect of gender social norms on the smoking gender gap. At any rate, to address this concern, all of our regressions include province fixed effects, as indicated in equation (1). Hence, identification in our benchmark model (see Table 3) comes from comparing girls and boys from different ancestries who live in the same province, which is the smallest geographic area available in our dataset. Column 1 in Table 5 again reports results from our benchmark specification to facilitate further comparisons.

Additional Country of Ancestry Controls and Alternative Specifications

Column 2 in Table 5 presents findings from a specification that controls for the country-of-ancestry Gini index, which captures the extent to which the distribution of income among individuals within a country deviates from a perfectly equal distribution (with an index close to 1 being very unequal and an index close to 0 being very equal), and the interaction between the Gini index and the female indicator. We find no evidence that second-generation immigrants whose parents come from countries with greater inequality are more (or less) likely to smoke than those whose parents come from more equal countries (as the coefficient on the Gini index is close to zero and not statistically significant). Similarly, inequality in the country of ancestry has no effect on the youth smoking gender differential. Most importantly, controlling for country-of-origin Gini index and its interaction with gender equality has no effect on the coefficient $\hat{\alpha}_3$, which remains at +0.039 and statistically significant.

Alternatively, one may be concerned that our results may be picking up gender differential smoking patterns for second-generation immigrants whose parents come from countries of ancestry more similar to Spain. If that were the case, controlling for an indicator of whether the country of ancestry is a Spanish-speaking country and its interaction with the gender dummy would reduce the effect of the GGI on the smoking gender gap. In Column 3 in Table 5 we present a specification that controls for these two additional variables. Doing so has no

effect on either the size or the significance of our coefficient of interest, $\hat{\alpha}_3$.

Column 4 in Table 5 presents results from a more flexible specification in which each year fixed effect is interacted with the female indicator to allow the smoking gender gap to vary depending on the cohort being interviewed in each ESTUDES wave. Again, doing so has little effect on our coefficient of interest, $\hat{\alpha}_3$, which now amounts to 4 percentage points and remains statistically significant at the 1 percent level.

Column 5 in Table 5 shows that our estimates are robust to clustering the standard errors at the host-country province level, as opposed to using the country-of-ancestry fixed effects. Doing so reduces the significance of our coefficient of interest to the 5 percent level.

Another potential concern is that second-generation immigrants from different ancestries may face different economic and institutional environments within the host country that may in turn affect boys and girls differently. While it is the central government that regulates excise taxation, smoking restrictions and clean-air regulations in Spain, the regions (*Comunidades Autónomas*, CCAA hereafter) manage the delivery of health services. Hence, one may be worried that differential health services across CCAA that may affect gender differently are driving our results. To address this concern, column 6 in Table 5 adds to our baseline specification an interaction between the female indicator and CCAA fixed effects. Note that because we have province fixed effects in the specification, we cannot also have CCAA fixed effects. Column 7 in Table 5 presents the specification with both CCAA fixed effects and their interaction of the female indicator (now excluding provinces fixed effects). Results are similar in both specifications. While our coefficient of interest, $\hat{\alpha}_3$, becomes smaller (it is now +0.025), it remains positive and statistically significant at the 5 percent level, indicating that gender social norms continue to explain a relevant share (45 percent) of the smoking gender gap even after controlling for potential gender differences in the delivery of health services at the CCAA level.

Column 8 in Table 5 presents a specification in which the GGI is replaced with country-of-ancestry fixed effects.[33] This specification is more flexible as it does not require the relationship between culture and smoking to be linear in our cultural proxy. Moreover, country-of-ancestry fixed effects account for the cultural features captured by the GGI *and* for any other cultural factors *not* related to gender equality that may affect boys' and girls' smoking in the same way. Doing so has very little effect on our coefficient of interest: $\hat{\alpha}_3$ is now 0.036 and remains statistically significant at the 1 percent level.

Changes in Sample Criteria

Table 6 shows that our results are not driven by specific groups of second-generation immigrants and/or certain countries of ancestry having disproportionally large numbers of observations. Column 1 presents our baseline estimation to facilitate comparisons, while Columns 2 to 4 present the results obtained when dropping the three countries of ancestry (one at a time) with the largest number of immigrants currently in the country, that is, Morocco, Ecuador and Romania (Rodríguez-Planas and Vegas, 2014). Additionally, Columns 2, 5, 6 and 7 present the results obtained when dropping the four countries of ancestry (one at a time) with the largest number of second-generation immigrants in our sample, that is: Morocco, France, Germany and Venezuela. Doing so has little effect on our main result. Only in the case of Moroccans, the largest group of second-generation immigrants by far, do we lose some precision as the effect of the GGI on the smoking gender gap is only statistically significant at the 10 percent level.

Falsification tests

Finally, we checked whether our results are spuriously picking up the effect of unobserved confounders at the country-of-ancestry level or merely due to chance by performing falsification tests. In particular, the GGI of all children from the same country of ancestry was replaced with a placebo GGI value that was

[33] The important advantages of using quantitative variables as proxies for culture, as we do in the rest of the paper, are that they allow one to be explicit as to why culture may matter and they facilitate thinking about potentially omitted variables.

randomly chosen such that the generated placebo GGI distribution mimicked the actual GGI distribution. We repeated this procedure 1,000 times and, in line with our results being genuine, we only obtained statistically significant estimates of our coefficient of interest in less than 1% of our placebo estimations.[34]

7. Heterogeneity

In this section we explore whether the transmission of cultural beliefs on the role of women in society varies across different types of second-generation immigrants by estimating our baseline specification for different subgroups. The first two columns of Table 7 present the coefficient of interest estimated for a particular subgroup of second-generation immigrants, while column 3 displays the p-value obtained when testing against the null hypothesis of equality of coefficients across subgroups.

Panels A and B of Table 7 explore whether the impact of culture on the smoking gender gap differs by maternal educational attainment and work status, respectively. Column 1 in Panel A shows that culture matters in determining the smoking gender gap of second-generation immigrants whose mother did not reach high-school. In contrast, the effect of culture on the smoking gender gap is two thirds smaller in size and *not* statistically significant for second-generation immigrants whose mother has at least some secondary education (see column 2 in Panel A). Column 3 shows that this differential impact of culture is statistically significant at the 5 percent level. Because we did not observe a decline in the "GGI*Female" coefficient once mother's human capital and its interaction with female were included (going from columns 3 to 4 in Table 4), we conclude that while there is important heterogeneity in the effects of GGI by maternal education, this variable does not appear to mediate the effects of GGI.

Panel B shows that there is no differential effect of culture on the smoking gender gap depending on whether mothers work or not. Indeed, we find that the effect of culture on the smoking gender gap is +0.036 and +0.037 for either group. Both coefficients are statistically significant at the 1 percent level. Similarly, Panel C of Table 7 shows that family structure (living in one- or two-parent household) does not seem to mediate in the transmission of beliefs. The effect of

[34] These results are available upon request from the authors.

culture on the smoking gender gap is +0.038 and +0.039 and statistically significant at the 1% and 10% level for single- and two-parent households, respectively.

Moving now to panel D in Table 7, we observe that the coefficient of interest is twice as large (and statistically significantly so at the 10.7 percent level) when cohabiting siblings smoke than when they do not. Because siblings' smoking habits and those of the teenager are likely to be jointly determined, caution is needed when interpreting these findings. Nonetheless, it is important to note that even for those teenagers whose siblings do not smoke, gender social norms affect the smoking gender gap as the coefficient of interest is +0.035 and statistically significant at the 5 percent level for this subgroup.

Panels E explores whether the effect of culture varies when "all, most or some" friends smoke versus "few or no" friends smoke.[35] To the extent that individuals choose their friends, some caution is (again) needed when interpreting these results. Panel E shows that the transmission of beliefs is three times larger (and statistically significantly so at the 5 percent level) for those whose friends also smoke. Again we find that even among those adolescents with few or no friends who smoke, second-generation immigrant girls whose country of ancestry is more gender equal are more likely to smoke (relative to boys) than those girls from less gender-equal countries of ancestry. The effect is +0.013 (statistically significant at the 5 percent level). Panels D and E suggest that, while siblings and peers' smoking behavior reinforces the transmission of beliefs, gender social norms continue to affect the gender smoking gap even when they do not smoke.

Finally, Panel F explores whether culture has a differential effect on the smoking gender gap depending on the concentration level of immigrants from the same country of origin in the province. We calculate the proportion of immigrants in each province from the same country of origin by dividing the number of immigrants from a particular country of birth in province k by the population (including natives and immigrants) in that particular province.[36] Even though the effect of culture on the smoking gender gap is twice as large for teenagers living

[35] Similar findings are obtained when comparing teens for whom all or most friends smoke versus few or no friends smoke.

[36] Immigrant and native populations at the province level and by country of origin are obtained from the 2001 Census.

in a province with a concentration of immigrants from the same ethnicity below the median ethnic concentration in the province, we cannot reject the null hypothesis that the effect of culture is the same for teenagers living in relatively high- and low-ethnic concentration provinces Most importantly, the impact of culture on the smoking gender gap is relevant for those living in *both* high- and low-ethnic concentration provinces, with the effects being statistically significant at the 1 percent level in both cases.[37]

8. Gender Social Norms and Other Risky Outcomes

In this section we explore the effect of country-of-ancestry gender social norms on other risky behaviors, namely the decision to drink alcohol, get drunk, binge drink (defined as drinking more than 5 drinks within two hours), smoke marijuana (during the past 30 days), get into a fight, and being arrested (during the past year).

The legal drinking age in Spain was increased by two years from 16 to 18 years in 2003. Nonetheless, drinking has always been part of the Spanish culture. Traditionally, youth began drinking in the presence of adult family members. However, with the arrival of the democracy in 1977, drinking among peers and outside the household became much more common (Heath, 1995), and alcohol consumption currently begins at an early age in Spain, around 13-14 years old (Ministerio de Sanidad, 2013).

In our sample of second-generation immigrants, 53, 23 and 30 percent of youths report having consumed alcohol, got drunk and binge drunk within the past 30 days, respectively. While there are no gender differences in the probability of consuming alcohol or getting drunk of second-generation immigrants, teenage boys in our sample are, on average, significantly more likely to have binge drunk (32 versus 28 percent) and smoked marijuana in the past 30 days (17 versus 14 percent) as well as more likely to have been involved in a fight (28 versus 14 percent) and have been arrested (11 versus 5 percent) within the past year than their female counterparts.

Moving now to Table 8, columns 1 to 3 indicate that a one standard deviation increase in the country-of-ancestry GGI is associated with a 4.8, 3.5 and

[37] This finding contrasts with those of Fernández and Fogli (2009) and Luttmer and Singhal (2011), who find a stronger impact of culture for immigrants who have a greater tendency to cluster with their ethnic community.

1.9 percentage points higher probability of consuming alcohol, getting drunk and binge drinking for teenage girls relative to boys, representing a 9, 15, and 6.3 percent increase with respect to the average prevalence of these behaviors, respectively. While there is no gender gap in our raw data for the probability of consuming alcohol and getting drunk, boys are more prone to binge drinking than girls by 3.58 percentage points. Hence, our estimate for binge drinking (Column 3 in Table 8) accounts for 53 percent of the gender gap in binge drinking. The first two effects are statistically significant at the 1 percent level, while the third one is only significant at the 10 percent level.

Along the same lines, Columns 4 and 5 in Table 8 reveal that descending from a country of ancestry with a GGI one-standard deviation above the mean is associated with a 2.2 and 3.1 percentage points higher probability of smoking marijuana and being involved in a fight for girls relative to boys, representing a 14 and 15 percent increase with respect to the mean prevalence of these behaviors, respectively. If instead we compare our estimated effects with the corresponding mean gender gaps in our sample (which amount to 3.4 and 14 percentage points for the probability of smoking marijuana and being involved in a fight, respectively), they account for 29 percent and 22 percent of such gaps. Both estimates are statistically significant at the 5 percent level. While we find no significant effect of culture on the likelihood of being arrested (see Column 6 of Table 8), estimates in Table 8 are mostly consistent with those obtained for smoking.

Overall, Table 8 strongly suggests that descending from more gender-equal countries makes female teenagers relatively more likely than male teenagers to engage in risky behaviors that go beyond smoking.

9. Investigating Potential Mechanisms: Perceived Risks of Smoking, Information Patterns, Parental Discipline and Access to Tobacco

This section further explores potential mechanisms behind our results. To do so, we now change the dependent variable and replace it with different measures of teenagers' beliefs about the health effects of smoking; their perceptions regarding drug-related information; their main sources of information on drugs; parental rules regarding their teenagers' behavior inside and outside the home, as well as teenagers' smoking habits; and teenagers' access to tobacco.

We carry out this investigation in two steps. First, in Table 9, we explore whether there are significant gender differences in the aforementioned outcome variables by estimating regressions that include a female indicator as well as all the individual controls in our baseline specification (not interacted with gender), province and year fixed effects. This specification clusters the standard errors at the province level. Second, Table 10 re-estimates our baseline specification with the alternative outcome variables in order to identify whether gender social norms affect differentially these various outcomes for girls and boys.

We observe that second-generation immigrant girls perceive higher risks of heavy smoking but somewhat lower risks of occasional smoking than their male counterparts (Panel A, Table 9). Indeed, second-generation immigrant girls are more likely than their male counterparts to think that smoking one pack of cigarettes a day is harmful for one's health (Columns 2 and 4, Panel A, Table 9). Both coefficients are statistically significant at the 1 percent level. In contrast, column 3 shows that second-generation immigrant girls are less likely than their male counterparts to think that smoking *sometimes* is harmful (albeit this coefficient is only statistically significant at the 10 percent level). Despite these gender differences in risk perception, there is no evidence of any gender differential effect of culture on the perceived risks of smoking (Panel A, Table 10).

In Panel B of Tables 9 and 10 we turn to the role played by the perceived amount of information about drugs received by teenagers, as well as the sources of this information. Interestingly, second-generation immigrant girls are less likely than their male counterparts to perceive that they are fully informed about drugs (Column 1, panel B, Table 9). However, there is no evidence that such perception significantly differs among girls and boys depending on whether their parents come from more (or less) gender equal countries (Column 1, Panel B, Table 10).[38]

[38] We obtain similar results if instead of analyzing teenagers' propensity to consider themselves *fully* informed about drugs we analyze the probability that they perceive themselves as *fully or sufficiently* informed about drugs.

Panel B in Table 9 also shows that second-generation immigrant girls and boys sometimes also differ when it comes to their main sources of information on drugs. While girls are significantly less likely than boys to cite their fathers as one of their main sources of information on drugs (Column 3), they are more likely than boys to refer to their teachers or health professionals (Columns 6 and 7, respectively) as relevant sources of information on drugs. Similarly, girls are also more likely than boys to have been asked about tobacco consumption by a doctor (Column 9). In sum, it appears that girls are more likely than boys to rely on doctors, teachers and health professionals to gather information on drugs, while boys are more likely to rely on their fathers.

Interestingly, Panel B in Table 10 shows that second-generation immigrant girls from more gender-equal countries are more likely, relative to boys, to receive information regarding drugs from their fathers (Column 3) or their friends (Column 5), but less likely to obtain it from the internet (Column 9). Hence, in this case, there is suggestive evidence that gender social norms affect boys and girls differently in terms of how they gather information on drugs. This result should be interpreted with caution because, to the extent that second-generation immigrant girls from more gender-equal countries are more likely to smoke (relative to boys) than those from less gender-equal countries, the fact that worried fathers and friends are more likely to talk about drug use with them may be a consequence (not necessarily a cause) of their higher propensity to smoke.

It is also worthwhile to highlight that second-generation immigrant girls whose parents come from more gender-equal countries do not receive more (or less) information about drugs from health professionals or teachers (relative to boys) than those whose parents come from less gender-equal countries (Columns 6 and 7, Panel B, Table 10), suggesting that there is no discrimination against or targeting towards a particular group of second-generation immigrant girls from more (or less) gender-equal ancestries.

Next, we explore how strict parents are inside and outside the home (Panel C of Tables 9 and 10), how tolerant they are towards their teenagers' smoking behavior and how easy it is for teenagers to obtain cigarettes (Panel D of Tables 9 and 10). We find that second-generation teenage girls are more likely to be closely

monitored by their parents when they go out at night than their male counterparts (Columns 3 and 4, Panel C, Table 9). Moreover, girls' parents are also more likely than boys' parents to establish a clear set of rules regarding what their teenagers can do outside the household (Column 2, Panel C, Panel 9), although this gender gap is only statistically significant at the 10% level. Interestingly, the opposite appears to happen *inside* the household, where teenage girls are less likely to face a clear set of rules than teenage boys (Column 1, Panel C, Table 9). Additionally, there is no evidence of a statistically significant gender gap as far as parental leniency towards smoking is concerned (Columns 1-4, Panel D, Table 9), while girls are significantly more likely than boys to declare that cigarettes are very easy to get (Column 5, Panel D, Table 9).

Panel C of Table 10, in turn, suggests that at least some aspects related to parental discipline and monitoring may play a role in explaining the association between gender social norms and the gender smoking gap that we have uncovered in previous sections. In particular, gender equality in the country of ancestry reduces the likelihood that parents monitor girls more closely than boys when they go out at night (Columns 3 and 4, Panel C, Table 10). Along these lines, although we found no gender gap in parental leniency towards smoking (Columns 1 and 2, Panel D, Table 9), Panel D in Table 10 (Column 2) indicates that second-generation immigrant girls from more gender-equal countries are more likely to have a mother who allows them to smoke outside of the family household—albeit this effect is only statistically significant at the 10 percent level. Finally, while we know that second-generation immigrant girls are more likely than boys to have very easy access to cigarettes (Column 5, Panel D, Table 9), we also observe that this gender gap is larger among teenagers whose parents come from more gender-equal countries than among those whose parents come from less gender-equal countries (Column 5, Panel D, Table 10).

Overall, the evidence presented in this section is suggestive that gender-related beliefs are being transmitted at least in the following two ways: parental monitoring and easy access to cigarettes.

10. Conclusion

This paper identifies the relevance of gender social norms in explaining youths' gender differences in smoking, contributing to an emerging literature on how beliefs affect behavioral outcomes. Crucially, this paper is the first to provide evidence that cultural attitudes towards gender equality affect girls' behaviors with potentially adverse health consequences, but not boys' engagement in risky behaviors. In particular, we show that descending from more gender-equal societies makes girls relatively more prone than boys to smoke. Moreover, the evidence indicates that the size of the effect of gender social norms on the smoking gender gap is large: if a girl's parents, originally from a country with "average" GGI, had instead come from a country with a GGI one-standard deviation above the mean, her likelihood of smoking relative to a male counterpart would have been between 2.5 and 3.9 percentage points higher, representing a 44 to 71 percent increase, depending on the specification. Our results are remarkably robust to a wide battery of sensitivity checks and to the use of alternative cultural proxies such as the female-to-male smoking ratio in the country of ancestry. Our findings suggest that, as gender equality increases, governments would need to consider implementing gender-tailored smoking reduction and cessation interventions, as well as promoting healthy behaviors for both men and women more generally. We also provide evidence that parental monitoring and easy access to cigarettes facilitate the transmission of gender social norms. Despite there being gender differences in terms of teenagers' perceived risks of smoking and in their patterns of acquisition of drug-related information, we do not find an association between these gender differences among second-generation immigrants and the gender social norms of their countries of ancestry. Altogether the evidence seems to point that girls' differential smoking is the result of having internalized certain beliefs on the stage of the diffusion of innovation or the epidemic they are in—which is not the actual stage in the host country, but that of their parents' country of origin.

Last but not least, our findings highlight that girls whose parents come from more gender-equal societies are also relatively more likely to engage in risky behaviors than their male counterparts, suggesting that gender equality reduces female teenagers' historical inhibition from engaging in behaviors traditionally more prevalent among males. While others have shown that more gender-equal societies are beneficial to girls' math test scores relative to those of boys

(Nollenberger, Rodríguez-Planas, and Sevilla, 2016; Guiso, Monte, Sapienza, and Zingales, 2008; and Fryer and Levitt, 2010), this paper is the first to bring to light the adverse effects of gender equality on unhealthy behavioral outcomes for women.

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Table 1. Gender Gap in Smoking, Female-to-Male Smoking Ratio, and Gender Equality Measures by Country of Ancestry

		In Spain	In Country of Ancestry							
	Country of ancestry	(1) Smoking gap	(2) Female smoking likelihood	(3) Male smoking likelihood	(4) F/M smoking ratio	(5) GGI	(6) GGI Ec. Opp.	(7) GGI Educ.	(8) GGI Pol. Emp.	(9) GGI H&S	(10) *N*
1	Austria	-0.554	0.071	0.625	0.946	0.709	0.595	0.989	0.274	0.979	22
2	Bolivia	-0.333	0.167	0.500	0.550	0.675	0.596	0.959	0.174	0.972	10
3	Australia	-0.286	0.214	0.500	0.806	0.727	0.743	1.000	0.192	0.974	28
4	India	-0.197	0.053	0.250	0.119	0.615	0.403	0.837	0.291	0.931	31
5	Senegal	-0.197	0.167	0.364	0.042	0.641	0.644	0.821	0.127	0.973	17
6	Gambia	-0.167	0.000	0.167	0.114	0.676	0.759	0.829	0.138	0.980	15
7	Norway	-0.143	0.000	0.143	0.968	0.840	0.831	1.000	0.561	0.970	11
8	Russia	-0.139	0.417	0.556	0.366	0.704	0.736	0.999	0.100	0.979	21
9	El Salvador	-0.133	0.200	0.333	0.352	0.660	0.553	0.988	0.118	0.980	11
10	Syria	-0.119	0.214	0.333	0.196	0.593	0.398	0.936	0.060	0.976	26
11	China	-0.106	0.065	0.171	0.044	0.688	0.693	0.981	0.149	0.929	81
12	Mexico	-0.028	0.255	0.283	0.335	0.658	0.521	0.991	0.139	0.980	101
13	Ecuador	-0.017	0.250	0.267	0.239	0.707	0.599	0.988	0.266	0.976	35
14	Philippines	-0.014	0.231	0.245	0.204	0.765	0.761	1.000	0.321	0.980	88
15	Morocco	-0.010	0.116	0.126	0.047	0.577	0.408	0.861	0.067	0.971	1,108
16	Switzerland	0.008	0.287	0.279	0.743	0.756	0.727	0.989	0.335	0.974	169
17	Poland	0.014	0.214	0.200	0.759	0.704	0.653	0.999	0.184	0.979	29
18	Algeria	0.015	0.375	0.360	0.012	0.605	0.467	0.953	0.035	0.966	41
19	Uruguay	0.023	0.203	0.180	0.743	0.690	0.657	1.000	0.123	0.980	119
20	Portugal	0.023	0.352	0.328	0.432	0.717	0.672	0.989	0.233	0.974	279
21	USA	0.029	0.344	0.314	0.786	0.741	0.799	1.000	0.186	0.979	67
22	Belgium	0.036	0.278	0.241	0.732	0.751	0.710	0.991	0.324	0.979	130
23	Venezuela	0.040	0.250	0.210	0.873	0.686	0.614	0.999	0.152	0.980	441
24	Dom. Rep.	0.047	0.292	0.245	0.559	0.677	0.652	1.000	0.087	0.971	121
25	Japan	0.048	0.333	0.286	0.305	0.652	0.572	0.986	0.072	0.980	13
26	Ireland	0.048	0.333	0.286	0.957	0.777	0.741	1.000	0.398	0.970	20
27	Argentina	0.068	0.349	0.281	0.671	0.719	0.602	0.995	0.298	0.980	319
28	Brazil	0.074	0.306	0.232	0.599	0.665	0.643	0.990	0.049	0.980	167
29	Angola	0.086	0.286	0.200		0.671	0.630	0.785	0.290	0.980	12
30	UK	0.097	0.287	0.190	0.930	0.746	0.721	1.000	0.293	0.970	271
31	Canada	0.104	0.286	0.182	0.756	0.737	0.777	0.998	0.196	0.978	18
32	Germany	0.113	0.292	0.179	0.845	0.753	0.714	0.994	0.325	0.978	520
33	Netherlands	0.114	0.354	0.240	0.881	0.744	0.723	0.997	0.288	0.970	98
34	France	0.131	0.354	0.222	0.816	0.702	0.661	1.000	0.169	0.980	990
35	Iran	0.132	0.286	0.154	0.063	0.593	0.426	0.959	0.016	0.971	20
36	Peru	0.151	0.378	0.227	0.339	0.689	0.620	0.980	0.193	0.966	140
37	Lebanon	0.167	0.167	0.000	0.679	0.608	0.448	0.977	0.028	0.980	11
38	Italy	0.170	0.442	0.273	0.667	0.677	0.589	0.995	0.152	0.970	107
39	Cuba	0.177	0.300	0.123	0.400	0.725	0.609	1.000	0.318	0.974	107
40	Finland	0.179	0.429	0.250	0.783	0.826	0.757	0.999	0.569	0.980	11
41	Chile	0.184	0.380	0.196	0.895	0.701	0.534	0.996	0.296	0.980	101
42	Colombia	0.198	0.370	0.172	0.404	0.693	0.694	0.996	0.102	0.979	118
43	Denmark	0.262	0.429	0.167	0.893	0.772	0.744	1.000	0.370	0.974	13
44	Sweden	0.267	0.455	0.188	1.029	0.802	0.770	0.996	0.471	0.973	38
45	Romania	0.375	0.375	0.000	0.577	0.683	0.708	0.989	0.056	0.977	15
	Mean	0.055	0.270	0.215	0.569	0.687	0.613	0.968	0.191	0.975	6,110
	St. Dev.	0.430	0.444	0.411	0.324	0.061	0.114	0.055	0.102	0.007	

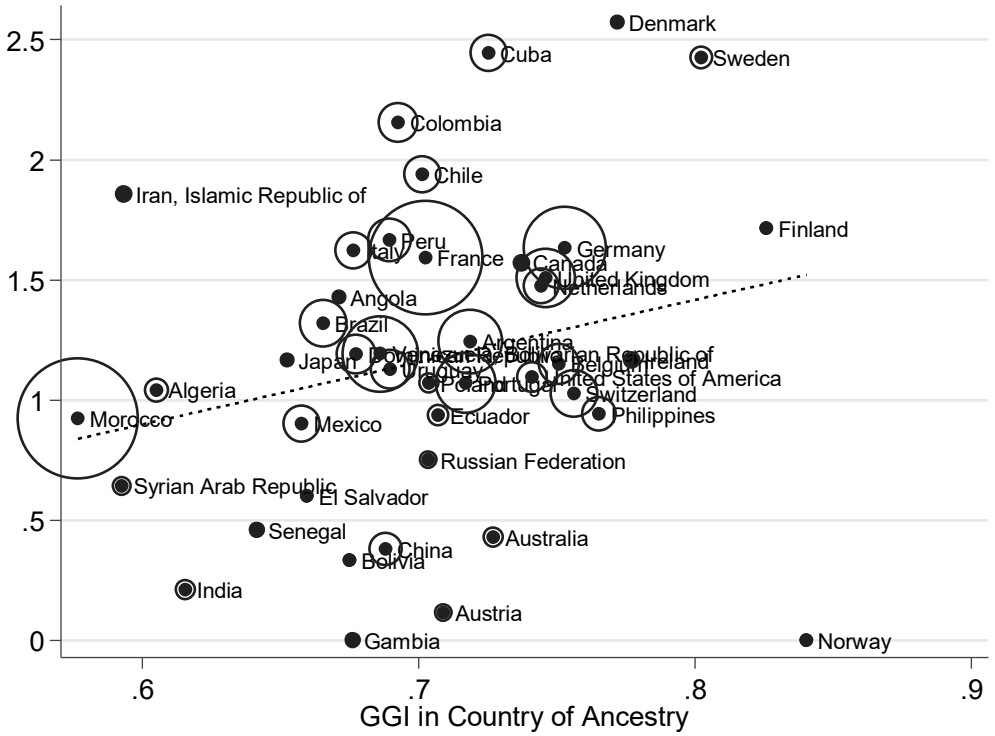
Notes: This Table displays the means of the smoking gender gap, the female smoking rate and the male smoking rate of our sample of ESTUDES second-generation immigrants living in Spain by country of ancestry (columns 1-3), as well as the mean values of the following country-of-ancestry variables: the female-to-male smoking ratio, the gender gap index and its four components (columns 4-9). Countries are ordered by the gender smoking gap in Spain. Column 10 displays our ESTUDES sample sizes of second-generation immigrants by country of ancestry. The last two rows display the overall cross-country means and standard deviations.

Table 2. Cross-Correlations: Youth Gender Smoking Gap in Spain, Female-to-Male Smoking Ratio, and Gender Equality by Country of Ancestry

	In Spain	In Country of Ancestry					
	Smoking gap in Spain	F/M smoking ratio	GGI	GGI Ec. Opp	GGI Educ.	GGI Pol.	GGI H&S
Smoking gap	1						
F/M smoking	0.217	1					
GGI	0.171	0.689	1				
GGI Ec. Opp.	0.122	0.521	0.854	1			
GGI Educ.	0.277	0.616	0.495	0.344	1		
GGI Pol. Emp.	0.074	0.547	0.848	0.525	0.169	1	
GGI H&S	0.192	0.345	0.165	0.192	0.234	-0.04	1

Notes: This table displays Pearson correlations between variables.

Figure 1. Raw Female-to-Male Smoking Ratios of Second Generation Immigrants and Gender Equality in Countries of Ancestry



Notes: Figure 1 displays the correlation between the raw female-to-male smoking ratio among second-generation immigrants and the non-standardized GGI in the country of ancestry. The regression line has a slope of 3.142 with a standard error of 0.926. The adjusted R^2 is 0.20. The bubbles represent the number of individuals in our sample.

Table 3. The Effect of Gender Social Norms on the Youth Smoking Gender Gap Using Alternative Measures of Gender Equality in the Country-of-Ancestry

Dependent Variable: Youth Smoking Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female-to-male smoking ratio*Female	0.046***						
	(0.012)						
GGI*Female		0.039***					
		(0.008)					
GGI Ec. Opp.*Female			0.036***				-0.005
			(0.009)				(0.021)
GGI Educ.*Female				0.046***			0.039**
				(0.013)			(0.019)
GGI Pol. Emp.*Female					0.024**		0.006
					(0.010)		(0.013)
GGI Health and Survival*Female						0.033***	0.021**
						(0.010)	(0.009)
R^2	0.088	0.087	0.086	0.088	0.085	0.087	0.090
Countries of ancestry	46	45	45	45	45	45	45
Observations	6,136	6,110	6,110	6,110	6,110	6,110	6,110

Notes: OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses. Country-of-ancestry measures are standardized. All the regressions include the following controls: country-of-ancestry GGI index (in columns 2-7), female-to-male smoking ratio (in column 1), a female dummy, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy as well as year and province fixed effects. Sample sizes and the number of countries of ancestry are not exactly the same in the first and the other columns because data availability slightly differs depending on the variables considered. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table 4. The Effect of Gender Equality in the Country of Ancestry on the Youth Smoking Gender Gap: Sensitivity to the Addition of Individual Controls

Dependent Variable: Youth Smoking Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	0.059***	0.059***	0.063***	-0.402	-0.919	-0.870	-0.671	-0.350
	(0.019)	(0.014)	(0.013)	(1.420)	(1.400)	(1.281)	(1.287)	(1.213)
GGI		-0.005	-0.005	-0.006	-0.005	-0.012	-0.013	-0.012
		(0.008)	(0.007)	(0.008)	(0.009)	(0.009)	(0.009)	(0.010)
GGI*Female		**0.036*** **	**0.038*** **	**0.039*** **	**0.036*** **	**0.035*** **	**0.036*** **	**0.025** **
		(0.007)	**(0.006)**	**(0.008)**	**(0.009)**	**(0.010)**	**(0.010)**	**(0.009)**
Age			0.237*	0.206*	0.194	0.138	0.148	0.070
			(0.121)	(0.116)	(0.123)	(0.119)	(0.122)	(0.109)
Age squared			-0.005	-0.004	-0.005	-0.003	-0.003	-0.002
			(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mother works			0.038***	0.045***	0.043***	0.037***	0.038***	0.034***
			(0.013)	(0.014)	(0.014)	(0.012)	(0.012)	(0.012)
Father works			-0.039***	-0.046***	-0.034*	-0.014	-0.011	0.002
			(0.014)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)
Mother Educ. High			0.011	0.025	0.049**	0.052***	0.052***	0.042**
			(0.016)	(0.022)	(0.020)	(0.019)	(0.019)	(0.018)
Mother Educ. Medium			0.015	0.005	0.015	0.007	0.010	0.002
			(0.014)	(0.021)	(0.019)	(0.019)	(0.018)	(0.018)
Father Educ. High			-0.015	-0.020	-0.012	-0.004	-0.006	-0.010
			(0.015)	(0.022)	(0.022)	(0.020)	(0.019)	(0.021)
Father Educ. Medium			-0.005	0.000	0.001	-0.002	-0.002	0.000
			(0.011)	(0.014)	(0.012)	(0.013)	(0.012)	(0.012)
Age*Female				0.066	0.132	0.125	0.099	0.051
				(0.182)	(0.178)	(0.163)	(0.164)	(0.156)
Age squared*Female				-0.002	-0.004	-0.004	-0.003	-0.002
				(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Mother works*Female				-0.013	-0.011	-0.012	-0.012	-0.018
				(0.020)	(0.019)	(0.020)	(0.020)	(0.021)
Father works*Female				0.013	0.017	0.008	0.006	-0.010
				(0.022)	(0.021)	(0.025)	(0.026)	(0.026)
Mother Educ.				-0.027	-0.036	-0.031	-0.032	-0.038
High*Female				(0.038)	(0.033)	(0.032)	(0.032)	(0.029)
Mother Educ.				0.021	0.018	0.020	0.016	0.022
Medium*Female				(0.032)	(0.029)	(0.030)	(0.030)	(0.026)
Father Educ.				0.013	0.018	0.023	0.024	0.032
High*Female				(0.035)	(0.032)	(0.030)	(0.030)	(0.026)
Father Educ.				-0.012	-0.003	0.000	-0.000	0.005
Medium*Female				(0.024)	(0.021)	(0.020)	(0.021)	(0.020)
Works					0.107***	0.104***	0.097***	0.078***
					(0.031)	(0.029)	(0.029)	(0.024)
Works*Female					0.007	-0.001	-0.004	-0.015
					(0.028)	(0.027)	(0.030)	(0.027)
Grade Retention					0.129***	0.112***	0.107***	0.104***
					(0.018)	(0.019)	(0.019)	(0.018)
Grade					0.013	0.019	0.016	0.002
Retention*Female					(0.037)	(0.037)	(0.038)	(0.035)
Lives with Mother and						-0.084***	-0.079***	-0.063***
Father						(0.022)	(0.023)	(0.021)

Lives with Mother and						0.024	0.024	0.033
Father*Female						(0.033)	(0.034)	(0.030)
Cohabiting Mother						0.117***	0.105***	0.084***
Smokes						(0.022)	(0.022)	(0.022)
Cohabiting Mother						0.013	0.011	0.005
Smokes*Female						(0.029)	(0.028)	(0.027)
Cohabiting Father						0.077***	0.065***	0.049**
Smokes						(0.022)	(0.021)	(0.019)
Cohabiting Father						-0.017	-0.023	-0.019
Smokes*Female						(0.023)	(0.024)	(0.025)
Cohabiting Siblings							0.161***	0.126***
Smoke							(0.038)	(0.037)
Cohabiting Siblings							0.024	0.016
Smoke*Female							(0.039)	(0.047)
Students Smoke in							0.035**	0.015
School							(0.015)	(0.016)
Students Smoke in							0.013	-0.004
School*Female							(0.020)	(0.019)
All/most/some Friends								0.260***
Smoke								(0.016)
All/most/some Friends								0.077***
Smoke*Female								(0.024)
R^2	0.047	0.049	0.086	0.087	0.111	0.135	0.148	0.252
Observations	6,110	6,110	6,110	6,110	6,110	6,110	6,110	6,110

Notes: OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses. GGI is standardized. All the regressions include year and province fixed effects.

*** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table 5. Additional Robustness Checks

Dependent Variable: Youth Smoking Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GGI*Female	**0.039*** **	**0.039*** **	**0.039*** **	**0.040*** **	**0.039** **	**0.025** **	**0.024** **	**0.036*** **
	(0.008)	**(0.008)**	**(0.009)**	**(0.009)**	**(0.015)**	**(0.011)**	**(0.009)**	**(0.008)**
Gini		0.001						
		(0.008)						
Gini*Female		-0.001						
		(0.014)						
Spanish speaking country			-0.001					
			(0.021)					
Spanish*Female			0.012					
			(0.024)					
GGI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Country of Ancestry FE	No	No	No	No	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE*Female	No	No	No	Yes	No	No	No	No
CCAA FE	No	No	No	No	No	No	Yes	No
CCAA FE*Female	No	No	No	No	No	Yes	Yes	No
R^2	0.087	0.087	0.087	0.087	0.087	0.091	0.085	0.096
Observations	6,110	6,099	6,110	6,110	6,110	6,110	6,110	6,110

Notes: All country-of-ancestry variables are standardized. OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses, with the exception of Column 5, where they are clustered by students' province of residence. On top of the variables indicated in the table, all the regressions include the following controls: a female dummy, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy as well as year fixed effects. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table 6. Sensitivity to Changes in Sample Criteria

Dependent Variable: Youth Smoking Dummy

	(1) All	(2) No Morocco	(3) No Romania	(4) No Ecuador	(5) No France	(6) No Germany	(7) No Venezuela
GGI*Female	0.039***	0.036*	0.039***	0.040***	0.033***	0.037***	0.039***
	(0.008)	(0.018)	(0.009)	(0.008)	(0.009)	(0.010)	(0.008)
R^2	0.087	0.070	0.087	0.087	0.093	0.091	0.088
Observations	6,110	5,002	6,095	6,075	5,120	5,590	5,669

Notes: OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses. GGI is standardized. All the regressions include the following controls: a female dummy, GGI, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy as well as year and province fixed effects. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table 7. Subgroup Analyses

A. By Maternal Education	< Secondary Education	≥ Secondary Education	Test of Equality of Coefficients (p-value)
GGI*Female	0.053***	0.018	[0.039]**
	(0.011)	(0.012)	
R^2	0.138	0.077	
N	2,524	3,586	
B. By Maternal Work Status	Working	Not Working	Test of Equality of Coefficients (p-value)
GGI×Female	0.036***	0.037***	[0.982]
	(0.012)	(0.013)	
R^2	0.077	0.128	
N	3,631	2,479	
C. By Family Structure	Lives with Both Parents	Does not Live with Both Parents	Test of Equality of Coefficients (p-value)
GGI×Female	0.039***	0.038*	[0.959]
	(0.009)	(0.021)	
R^2	0.091	0.111	
N	4,814	1,296	
D. By Smoking Habits of Cohabitating Siblings	Cohabiting Siblings Smoke	Cohabiting Siblings do not Smoke	Test of Equality of Coefficients (p-value)
GGI*Female	0.071***	0.035***	[0.107]
	(0.026)	(0.009)	
R^2	0.274	0.083	
N	453	5,657	
E. By Friends' Smoking Habits	All/most/some Friends Smoke	Few/no Friends Smoke	Test of Equality of Coefficients (p-value)
GGI×Female	0.048***	0.013**	[0.019]**
	(0.013)	(0.006)	
R^2	0.054	0.058	
N	3,129	2,981	
F. By Proportion of Immigrants of Same Ancestry	Above Median	Below Median	Test of Equality of Coefficients (p-value)
GGI×Female	0.035***	0.072***	[0.133]
	(0.009)	(0.024)	
R^2	0.086	0.129	
N	4,849	1,261	

Notes: Results from estimating our baseline specification (see Table 3) with different sub-samples. Columns 1 and 2 present the effect of the GGI on the smoking gender gap for the subgroup indicated. Column 3 displays the p-value of the test of equality of coefficients across groups. *p<0.1, ** p<0.05, *** p<0.01.

Table 8. The Effect of Country-of-Ancestry Gender Equality on the Gender Gap in Other Risky Behaviors

	(1) Consumed alcohol	(2) Got drunk	(3) Binge drank	(4) Smoked marijuana	(5) Involved in a fight	(6) Arrested
GGI*Female	0.048***	0.035***	0.019*	0.022**	0.031***	0.005
	(0.011)	(0.010)	(0.010)	(0.009)	(0.011)	(0.007)
R^2	0.213	0.115	0.138	0.079	0.066	0.063
N	6,130	6,075	6,111	6,124	6,130	6,134

Notes: OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses. GGI is standardized. All the regressions include the following controls: a female dummy, GGI, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy as well as year and province fixed effects. Dependent variables 1-4 refer to the previous month, while dependent variables 5-6 refer to the previous year. Binge drinking is defined as ingesting 5+ alcoholic drinks in no more than 2 hours. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level

Table 9. Gender Differences in Perceived Risks of Smoking, Information on Drugs, Parental Discipline and Access to Tobacco

Panel A. Beliefs About the Health Effects of Smoking

	(1) Smoking sometimes creates several or many health problems	(2) Smoking 1 pack a day creates several or many health problems	(3) Smoking sometimes creates many health problems	(4) Smoking 1 pack a day creates many health problems
Female	0.001	0.058***	-0.015*	0.081***
	(0.013)	(0.011)	(0.008)	(0.008)
R^2	0.042	0.038	0.041	0.028
N	6,083	6,051	6,083	6,051

Panel B. Information on Drugs. Amount (self-assessed) and Sources

	(1) Full informed about drugs	(2) Mother is one of main info sources on drugs	(3) Father is one of main info sources on drugs	(4) Siblings are one of main info sources on drugs	(5) Friends are one of main info sources on drugs	(6) Teachers are one of main info sources on drugs	(7) Health prof. are one of main info sources on drugs	(8) Internet is one of main info sources on drugs	(9) Dr. asked about tobacco consumption
Female	-0.107***	0.003	-0.026**	0.010	0.013	0.050***	0.018*	0.010	0.029**
	(0.015)	(0.012)	(0.012)	(0.007)	(0.009)	(0.013)	(0.010)	(0.010)	(0.012)
R^2	0.051	0.025	0.380	0.107	0.270	0.386	0.215	0.258	0.093
N	6,051	6,193	6,193	6,193	6,193	6,193	6,193	6,193	6,024

Panel C. Parental Rules and Monitoring Inside and Outside the Home

	(1) Parents almost always/often set clear rules about what can be done at home	(2) Parents almost always/often set clear rules about what can be done out of home	(3) Parents almost always/often know who I go out with at night	(4) Parents almost always/often know where I go when I go out at night
Female	-0.022**	0.021*	0.089***	0.101***
	(0.010)	(0.012)	(0.016)	(0.017)
R^2	0.056	0.058	0.024	0.033
N	6,068	6,045	5,982	5,975

Panel D. Parental Rules Regarding their Children Smoking Habits and Access to Tobacco

	(1) Mother allows/would allow student to smoke anywhere	(2) Mother allows/would allow student to smoke anywhere but home	(3) Father allows/would allow student to smoke anywhere	(4) Father allows/would allow student to smoke anywhere but home	(5) Very easy access to tobacco
Female	-0.006	0.001	-0.008	-0.009	0.029**
	(0.008)	(0.010)	(0.006)	(0.009)	(0.012)
R^2	0.060	0.110	0.041	0.085	0.098
N	5,966	5,966	5,964	5,964	6,064

Notes: OLS coefficient estimates and their associated standard errors clustered by by country of ancestry in parentheses. All the regressions include the following controls: age, age squared, parental labor market status dummies, parental education dummies, year and province fixed effects.
*** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table 10. The Effect of Gender Equality in the Country of Ancestry on the Gender Gap in Perceived Risks of Smoking, Information on Drugs, Parental Discipline and Access to Tobacco

Panel A. Beliefs About the Health Effects of Smoking

	(1) Smoking sometimes creates several or many health problems	(2) Smoking 1 pack a day creates several or many health problems	(3) Smoking sometimes creates many health problems	(4) Smoking 1 pack a day creates many health problems
GGI * Female	0.021	0.005	0.005	-0.013
	(0.013)	(0.010)	(0.006)	(0.011)
R^2	0.043	0.040	0.043	0.030
N	6,083	6,051	6,083	6,051

Panel B. Information on Drugs. Amount (self-assessed) and Sources

	(1) Perfectly informed about drugs	(2) Mother is one of main info sources on drugs	(3) Father is one of main info sources on drugs	(4) Siblings are one of main info sources on drugs	(5) Friends are one of main info sources on drugs	(6) Teachers are one of main info sources on drugs	(7) Health prof. are one of main info sources on drugs	(8) Internet is one of main info sources on drugs	(9) Dr. asked about tobacco consumption
GGI * Female	-0.002	0.010	0.027***	-0.008	0.011**	-0.007	0.002	-0.016**	0.005
	(0.007)	(0.009)	(0.007)	(0.006)	(0.004)	(0.011)	(0.005)	(0.006)	(0.011)
R^2	0.054	0.028	0.382	0.108	0.272	0.388	0.216	0.260	0.095
N	6,051	6,193	6,193	6,193	6,193	6,193	6,193	6,193	6,024

Panel C. Parental Rules and Monitoring Inside and Outside the Home

	(1) Parents almost always/often set clear rules about what can be done at home	(2) Parents almost always/often set clear rules about what can be done out of home	(3) Parents almost always/often know who I go out with at night	(4) Parents almost always/often know where I go when I go out at night
GGI * Female	0.018	-0.014	-0.022***	-0.027**
	(0.011)	(0.009)	(0.007)	(0.011)
R^2	0.058	0.062	0.025	0.036
N	6,068	6,045	5,982	5,975

Panel D. Parental Rules Regarding their Children Smoking Habits and Access to Tobacco

	(1) Mother allows/would allow student to smoke anywhere	(2) Mother allows/would allow student to smoke anywhere but home	(3) Father allows/would allow student to smoke anywhere	(4) Father allows/would allow student to smoke anywhere but home	(5) Very easy access to tobacco
GGI * Female	0.004	0.013*	0.001	0.004	0.033**
	(0.006)	(0.007)	(0.004)	(0.006)	(0.013)
R^2	0.062	0.116	0.043	0.089	0.100
N	5,966	5,966	5,964	5,964	6,064

Notes: OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses. All the regressions include the following controls: a female dummy, standardized GGI, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy as well as year and province fixed effects. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Appendix for Online Publication

Table A. 1. Individual-Level Variables: Descriptive Statistics

Variables	(1) Mean	(2) St. Dev.	(3) Min.	(4) Max.
Youth Smokes	0.244	0.430	0	1
Female	0.540	0.498	0	1
Age	15.59	1.210	14	18
Youth Works	0.135	0.341	0	1
Grade Retention	0.303	0.460	0	1
Lives with Mother and Father	0.788	0.409	0	1
Cohabiting Mother Smokes	0.218	0.413	0	1
Cohabiting Father Smokes	0.212	0.409	0	1
Cohabiting Siblings Smoke	0.074	0.262	0	1
Students Smoke in School	0.683	0.465	0	1
All/most Friends Smoke	0.281	0.450	0	1
Mother works	0.594	0.491	0	1
Father works	0.787	0.410	0	1
Mother Educ. High	0.243	0.429	0	1
Mother Educ. Medium	0.344	0.475	0	1
Father Educ. High	0.238	0.426	0	1
Father Educ. Medium	0.311	0.463	0	1

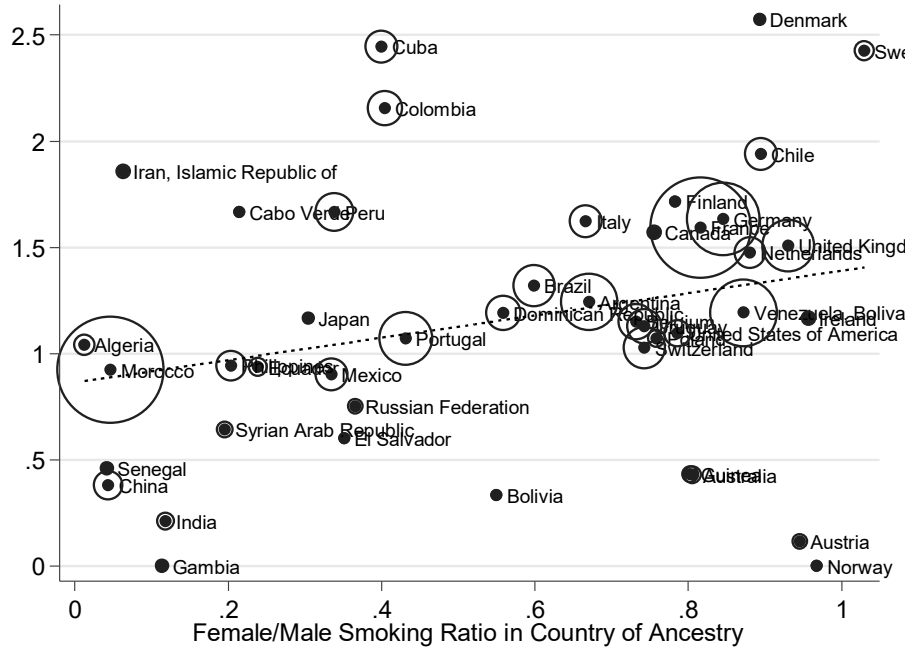
Notes: Statistics based on the benchmark sample of 6,110 second-generation immigrants used in most of our estimations. Source: ESTUDES 2006, 2008, 2010 and 2012.

Table A.2. Smoking Prevalence by Gender and Immigrant Status

	All	Natives	2nd. Gen. Imm.	2nd. Gen. Imm. (final sample)
Girls	0.297	0.305	0.270	0.271
Boys	0.247	0.250	0.216	0.215
Gap	**0.049**	**0.055**	**0.054**	**0.055**
P-value	(0.000)	(0.000)	(0.000)	(0.000)
N	114,381	96,209	6,903	6,110

Notes: Source: ESTUDES 2006, 2008, 2010 and 2012.

Figure A.1. Raw Female-to-Male Smoking Ratios of Second Generation Immigrants and Female-to-Male Smoking Ratios in Countries of Ancestry



Notes: Appendix Figure A.1 displays the correlation between the raw female-to-male smoking ratio among second-generation immigrants and the female-to-male smoking ratio in the country of ancestry. The regression line has a slope of 0.647 with a standard error of 0.168. The adjusted R^2 is 0.24. The bubbles represent the number of individuals in our sample.

Table A.3. Logit Average Partial Effects. The Effect of Gender Social Norms on the Youth Smoking Gender Gap, Using Alternative Measures of Gender Equality in the Country-of-Ancestry.

Dependent Variable: Youth Smoking Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female-to-male smoking ratio*Female	0.044***						
	(0.011)						
GGI*Female		0.037***					
		(0.007)					
GGI Ec. Opp.*Female			0.033***				-0.005
			(0.009)				(0.019)
GGI Educ.*Female				0.050***			0.044**
				(0.015)			(0.020)
GGI Pol. Emp.*Female					0.019**		0.004
					(0.009)		(0.011)
GGI Health and Survival*Female						0.035**	0.022**
						(0.012)	(0.011)
Pseudo-R^2	0.087	0.086	0.086	0.088	0.085	0.087	0.089
Countries of ancestry	46	45	45	45	45	45	45
Observations	6,136	6,110	6,110	6,110	6,110	6,110	6,110

Notes: Logit average partial effects and their associated standard errors clustered by country of ancestry in parentheses. All the regressions include the following controls: a female dummy, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy, as well as year and province fixed effects. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table A.4. Probit Average Partial Effects. The Effect of Gender Social Norms on Youth Smoking Gender Gap, Using Alternative Measures of Gender Equality in the Country-of-Ancestry Estimates

Dependent Variable: Youth Smoking Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Female-to-male smoking ratio*Female	0.045***						
	(0.011)						
GGI*Female		0.039***					
		(0.007)					
GGI Ec. Opp.*Female			0.036***				-0.004
			(0.009)				(0.019)
GGI Educ.*Female				0.050***			0.043**
				(0.013)			(0.019)
GGI Pol. Emp.*Female					0.021**		0.004
					(0.010)		(0.011)
GGI Health and Survival*Female						0.036***	0.023**
						(0.011)	(0.011)
Pseudo-R^2	0.087	0.086	0.086	0.088	0.085	0.087	0.090
Countries of ancestry	46	45	45	45	45	45	45
Observations	6,136	6,110	6,110	6,110	6,110	6,110	6,110

Notes: Probit average partial effects and their associated standard errors clustered by country of ancestry in parentheses. All the regressions include the following controls: a female dummy, age, age squared, parental labor market status dummies, parental education dummies, and their interactions with the female dummy as well as year and province fixed effects. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.

Table A.5. Sensitivity Analysis to Individual Controls Using Country-of-Ancestry Female-to-Male Smoking Prevalence Ratio instead of the GGI

Dependent variable: Youth Smoking Dummy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female	0.058***	0.058***	0.062***	-0.450	-0.954	-0.928	-0.726	-0.368
	(0.019)	(0.011)	(0.011)	(1.438)	(1.411)	(1.307)	(1.316)	(1.237)
Female-to-male smoking		-0.007	-0.004	-0.005	-0.002	-0.011	-0.012	-0.010
ratio		(0.008)	(0.007)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)
Female-to-male smoking		**0.043*** **	**0.044*** **	**0.046*** **	**0.042*** **	**0.041*** **	**0.041*** **	**0.030** **
ratio*Female		**(0.010)**	**(0.009)**	**(0.012)**	**(0.012)**	**(0.013)**	**(0.013)**	**(0.011)**
Age			0.232*	0.198*	0.188	0.132	0.142	0.066
			(0.118)	(0.115)	(0.122)	(0.119)	(0.122)	(0.109)
Age squared			-0.005	-0.004	-0.005	-0.003	-0.003	-0.002
			(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Mother works			0.037***	0.045***	0.043***	0.037***	0.038***	0.034***
			(0.013)	(0.014)	(0.013)	(0.012)	(0.012)	(0.012)
Father works			-0.039***	-0.044**	-0.032*	-0.012	-0.008	0.005
			(0.014)	(0.016)	(0.017)	(0.017)	(0.018)	(0.018)
Mother Educ. High			0.011	0.027	0.050**	0.054***	0.054***	0.043**
			(0.016)	(0.022)	(0.020)	(0.019)	(0.019)	(0.019)
Mother Educ. Medium			0.014	0.006	0.016	0.009	0.011	0.004
			(0.015)	(0.021)	(0.019)	(0.019)	(0.019)	(0.018)
Father Educ. High			-0.016	-0.020	-0.012	-0.004	-0.005	-0.009
			(0.015)	(0.022)	(0.022)	(0.020)	(0.019)	(0.021)
Father Educ. Medium			-0.005	0.002	0.002	-0.000	-0.000	0.002
			(0.011)	(0.014)	(0.013)	(0.013)	(0.012)	(0.012)
Age*Female				0.073	0.138	0.134	0.107	0.055
				(0.185)	(0.180)	(0.167)	(0.168)	(0.159)
Age squared*Female				-0.003	-0.005	-0.004	-0.004	-0.002
				(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
Mother works*Female				-0.015	-0.013	-0.013	-0.014	-0.020
				(0.021)	(0.020)	(0.021)	(0.021)	(0.021)
Father works*Female				0.008	0.013	0.005	0.002	-0.014
				(0.022)	(0.021)	(0.026)	(0.027)	(0.026)
Mother Educ. High*Female				-0.030	-0.038	-0.033	-0.035	-0.040
				(0.039)	(0.034)	(0.033)	(0.034)	(0.030)
Mother Educ.				0.018	0.015	0.017	0.014	0.019
Medium*Female				(0.032)	(0.029)	(0.030)	(0.031)	(0.027)
Father Educ. High*Female				0.012	0.017	0.021	0.022	0.031
				(0.034)	(0.032)	(0.029)	(0.030)	(0.026)
Father Educ.				-0.013	-0.005	-0.002	-0.002	0.003
Medium*Female				(0.023)	(0.021)	(0.020)	(0.021)	(0.020)

Works					0.107***	0.104***	0.097***	0.078***
					(0.031)	(0.028)	(0.029)	(0.024)
Works*Female					0.004	-0.003	-0.007	-0.017
					(0.028)	(0.027)	(0.030)	(0.028)
Grade Retention					0.130***	0.112***	0.107***	0.104***
					(0.018)	(0.019)	(0.019)	(0.018)
Grade Retention*Female					0.013	0.019	0.015	0.001
					(0.037)	(0.038)	(0.038)	(0.035)
Lives with Mother and Father						-0.083***	-0.079***	-0.063***
						(0.022)	(0.024)	(0.021)
Lives with Mother and Father*Female						0.021	0.022	0.031
						(0.033)	(0.034)	(0.030)
Cohabiting Mother Smokes						0.118***	0.107***	0.085***
						(0.023)	(0.022)	(0.022)
Cohabiting Mother Smokes*Female						0.007	0.006	0.002
						(0.029)	(0.028)	(0.028)
Cohabiting Father Smokes						0.075***	0.063***	0.048**
						(0.021)	(0.021)	(0.019)
Cohabiting Father Smokes*Female						-0.015	-0.021	-0.019
						(0.023)	(0.024)	(0.025)
Cohabiting Siblings Smoke							0.164***	0.127***
							(0.038)	(0.037)
Cohabiting Siblings Smoke*Female							0.021	0.014
							(0.039)	(0.047)
Students Smoke in School							0.034**	0.014
							(0.015)	(0.016)
Students Smoke in School*Female							0.014	-0.005
							(0.020)	(0.019)
All/most/some Friends Smoke								0.259***
								(0.016)
All/most/some Friends Smoke*Female								0.078***
								(0.024)
R^2	0.047	0.050	0.088	0.088	0.112	0.136	0.148	0.253
Observations	6,136	6,136	6,136	6,136	6,136	6,136	6,136	6,136

Notes: OLS coefficient estimates and their associated standard errors clustered by country of ancestry in parentheses. All the regressions include year and province fixed effects. *** indicates significance at least the 1% level, ** at least the 5% level, * at least the 10% level.