

Gender Education Gaps among Indigenous and Nonindigenous Groups in Bolivia

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WORLD BANK GROUP

Social, Urban, Rural and Resilience Global Practice Group

August 2015

Abstract

This paper studies gender education gaps among indigenous and nonindigenous groups in Bolivia. Using the National Census of Population and Housing 2012 and an estimation method analogous to difference-in-differences, the paper finds that the intersection of gender and indigenous identity confers cumulative disadvantage for indigenous women in literacy, years of schooling, and primary and secondary school completion. Although gender education gaps have become narrower across generations, there

remain significant differences among indigenous groups. The Aymara have the largest gender gap in all outcomes, despite having high overall attainment rates and mostly residing in urban centers, with greater physical access to schools. The Quechua have relatively smaller gender gaps, but these are accompanied by lower attainment levels. The paper discusses the possible sources of these differentials and highlights the importance of taking gender dynamics within each indigenous group into greater consideration.

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Keywords: Gender; indigenous; intersectionality; education; Bolivia.

JEL codes: I24, J15, J16.

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1. Introduction

Across Latin America, development outcomes show significant variation across indigenous and nonindigenous groups. It is widely acknowledged, for example, that indigenous peoples are disproportionately represented among the poor, have lower human and physical capital endowments, and face persistent inequalities in labor markets and access to public goods and services (Hall and Patrinos 2006, Chong and Ñopo 2008, Barrón 2008, Ferranti et al. 2004, McEwan 2004, Escobal and Ponce 2007, Psacharopoulos and Patrinos 1994). Several explanations have been offered for these systemic patterns, ranging from historical accounts that highlight the structural inequalities faced by indigenous peoples since their first interaction with the Spanish colonists (Pasquier-Doumer 2002, Mahoney 2003) to more recent, purist attempts at establishing a link between observed outcome gaps and their correlates (Ñopo et al. 2010, Patrinos and Skoufias 2007, Ferreira and Gignoux 2011, Pasquier-Doumer and Brandon 2015). While these analyses are often prone to data and identification challenges (World Bank 2014), increased documentation of indigenous disadvantage in recent years has played an important role in country policies and discourses across Latin America.

What is not as well understood as the extent of indigenous disadvantage, even in Latin American contexts where this line of research is most advanced, is the *heterogeneity of and outcome disparities within* indigenous groups. Census data from the first decade of the 2000s suggest that there are at least 41 million indigenous people across Latin American countries, each with a different level of interaction with state institutions and “mainstream” society (World Bank 2015).¹ In each context, moreover, indigenous identity intersects with other individual or group identities, such as gender and geography, adding an incredible degree of diversity to the standard nomenclature. Intersectionality refers to the notion that individuals and groups are simultaneously situated in multiple social structures, and the intersection of their various identities may result in multiplication of disadvantage (Phoenix and Pattynama 2006, Collins 1999, Crenshaw 1989). Recently, such cumulative disadvantages have been identified at the intersection of gender, ethnicity, race and class, with studies showing substantial gaps in labor market outcomes (Browne and Misra 2003, Torres-Stone et al. 2006), access to health care (Sen, Iyer and Mukherjee 2009, Sen and Iyer 2012, Iyer, Sen and Ostlin 2008), and educational attainment (Bhopal and Preston 2012, Lewis and Lockheed 2007, King and de Walle 2007, Tas, Reimao and Orlando 2014), among others.² Yet, literature on the intersection of indigenous identities with other identities remains sparse, and as a result, little is known about the achievement gaps of different subgroups of indigenous populations who may require special attention.

¹ The estimated size of the indigenous population in Latin America is based on the latest available census of each country in the region, using self-identification and language as identity markers (World Bank 2015). This estimate excludes thirteen Caribbean countries that do not have any statistical information concerning indigenous peoples (Aruba, the Bahamas, Barbados, Cuba, Grenada, Haiti, Cayman Islands, Jamaica, Puerto Rico, Dominican Republic, Saint Kitts and Nevis, Saint Vincent and the Grenadines, and Trinidad and Tobago). In countries with available data sources, it is still possible that the number of indigenous groups are underestimated due to underreporting of indigenous status, political economy of enumeration, and systematic exclusion of remote communities from census.

² See Browne and Misra 2003 for an overview of the empirical literature in sociology. Also, see a special issue of *Feminist Economics* (Vol. 8, Issue. 2, 2002) for a collection of interdisciplinary empirical studies on the intersectionality of gender, race and class.

This paper studies gender education gaps among indigenous and nonindigenous groups in Bolivia, a country that hosts the largest proportion of indigenous population in Latin America. The paper uses the 2012 National Census of Population and Housing and an estimation method analogous to difference-in-differences, originally proposed by Taş, Reimão and Orlando (2014), to compare the size of educational disadvantage faced by men and women across different subgroups of the population. The objective of the paper is to quantify the extent of educational disadvantages faced by men and women from different ethnic backgrounds, so as to account for the heterogeneity of the Bolivian population and for gender dynamics within each subgroup.

The intersectionality of gender and indigenous identity is highly relevant in the Bolivian context, where at least one in two persons identify themselves as indigenous.³ Indigenous groups in Bolivia also show a great deal of heterogeneity in terms of culture, language, location of residence and level of interaction with state institutions. Each indigenous group, moreover, has had a different experience with the Bolivian state's attempts to accommodate this diversity, which ranged from efforts to create a *mestizo* nation in the beginning of the 20th century, to official commitment to multiculturalism and plurinationality in recent years (Crabtree and Chaplin 2013, Stephson 1999, Brienen 2002, Claire 1989). In the realm of education specifically, historical accounts point to a divide between the way Aymaras and other indigenous groups have reacted to the state's push for rural and indigenous education since the 1930s. Because Aymaras have historically faced more land disputes with the post-colonial governments, they have generally viewed Western education and Spanish proficiency as instruments for pushing back against dispossession of their land, for understanding land legislation, and for navigating the legal system (Howard-Malverde and Canessa 1995). Other indigenous groups, including Quechua, have generally experienced a top-down introduction to post-colonial education, resulting in a more ambivalent view of its relevance and compatibility with local culture. These ethnicity-based differences, combined with generally lower levels of education observed among Bolivian women, invite an intersectional analysis of gender education gaps *within* the indigenous population of Bolivia.

That educational disadvantages in Bolivia might accumulate at the intersection of gender and indigenous identity, and that the size of these cumulative disadvantages may vary within the indigenous population, is relevant for policy. Educational gaps not only affect current wellbeing and human capital, but can also carry over to other outcomes and to future generations. Labor market outcomes in Bolivia, for example, show significant variance by gender and between indigenous and nonindigenous groups (Patrinos and Psacharopoulos 1993), with the difference being driven by educational gaps across these categories (Jiménez et al. 2006, Ñopo et al. 2010, Canelas and Salazar 2014). As such, differences in education *within* indigenous groups may translate into further heterogeneity in labor market outcomes. In addition, education has been found to be correlated with health outcomes (Breierova and Duflo 2004), likelihood of living in poverty (Jiménez et al. 2006) and economic growth (Klasen and Lamanna 2009), as well as being transferred across generations, as the children of disadvantaged parents tend to have worse

³ The percentage of indigenous population in Bolivia is based on self-reported ethnicity variable in the 2012 census. Previous censuses in Bolivia estimated the share of indigenous population to be over 60 percent (see Molina and Albó 2006, Jiménez et al. 2006). This is consistent with the literature on self-reports of ethnicity, which shows that race, color and other self-identification indicators tend to vary across time, place, economic status and even according to race or color of the interviewer who asks the question during data collection (Telles and Paschel 2012).

education outcomes, are more likely to perform child labor, and are more likely to become unemployed later in life (Bowles et al. 2005, Becker and Tomes 1986, Jiménez et al. 2006). Thus, identification of systematic gaps within indigenous groups may not only reveal educational disadvantages faced by men and women in each group, but can also help understand other disparities and inter-generational patterns that go well beyond those outcomes.

The analysis presented in this paper contributes to the education literature in Bolivia in three ways. First, the paper documents, using the most recent census data, that there is a cumulative disadvantage associated with being both female and indigenous, which is manifested in measured gaps in literacy, years of schooling, and primary and secondary school completion. Second, the paper shows that gender education gaps have become narrower over time for all ethnic groups, as indicated by smaller gender- and ethnicity-based disparities among younger cohorts. Nevertheless, gaps in school completion are still large, even among the younger cohorts of indigenous groups. Finally, the paper reveals a systematic pattern of gender-based disadvantage *within* the indigenous population, which has largely been neglected by the previous literature. In particular, it shows that Quechuas have the lowest average educational attainment in the country, but this is accompanied by relatively small differences between Quechua men and Quechua women. Aymaras, on the other hand, have a much higher average attainment level (in fact, the second highest in all of Bolivia, after nonindigenous groups), but this is accompanied by the largest gender gap observed within any group in the country, making Aymara women particularly disadvantaged relative to Aymara men.

Overall, these findings suggest that the greatest penalty to Quechua women's educational achievement stems from their indigenous identity, while the penalty faced by Aymara women stems from being *both* indigenous *and* female. The gender- and ethnicity-based differentials captured in this paper warrant further investigation, as they have implications on inter-generational transmission of disadvantage, as well as on the design and implementation of education programs in Bolivia.

2. Indigenous Peoples and Education Reform in Bolivia

Indigenous peoples in Bolivia, a lower middle-income country that hosts the largest share of indigenous population in Latin America, have had a long and complex history with education. Since the early 20th century, when education became a central tenet of nation-building and the official mechanism through which to create a *mestizo* nation, Bolivia has had a contentious, if not paradoxical discourse on indigenous education. The education literature on Bolivia has generally mirrored this discourse and has been influenced by successive reforms and policy shifts that have taken place over a century.

For the post-colonial Bolivian state, schooling was an essential part of its ambition to integrate indigenous peoples into "mainstream society" and to create a common identity around which Bolivia could unite and progress (Salmon 1986, Choque 1992, Claire 1989). The first wave of nationwide education reforms, implemented during the first half of the 20th century, reflected these testaments, with a section dedicated to rural and indigenous education being created under

the Ministry of Education in the 1930s (PROEIB Andes 2000).⁴ However, historical accounts suggest that, aside from equipping indigenous groups with productive skills in order to increase their participation in the economy, the Spanish-based curriculum used in rural schools reflected ambivalence among the urban elite to recognize indigenous identities and cultures. Specifically, studies suggest that rural schools built in this period reproduced racial hierarchy through a uniform, Spanish-based curriculum and Western pedagogical practices, reinforcing the notion that indigenous culture is separate from urban culture (Canessa 2004, Soria 1992, Choque et al. 1992).

The uptake of these early reforms by indigenous populations were similarly influenced by the political discourse on the status of indigenous groups in Bolivian society (Stephson 1999). For Aymaras, for instance, education has been strongly tied to their land rights and its deliberate appropriation as a tool of empowerment. Aymaras have historically inhabited the most fertile regions of the Bolivian highlands, and the mass dispossession of their lands in the mid-19th century by post-colonial governments introduced both an urgency and a utility for Western education among this group. In particular, proficiency in spoken and written Spanish was quickly understood as paramount for navigating the legal system, understanding laws and old land titles, and challenging local landlords on issues of tenure and ownership of ancestral lands (Howard-Malverde and Canessa 1995, Brien 2002). Within this setting, clandestine schools were set up, spreading Western education over a wide area of Aymara regions (Claire 1989). In comparison, the exposure of other indigenous groups to Western education has been more ambivalent and largely led by the liberal urban elite. For these groups, formal schooling offered the prospect of social mobility in a Spanish-speaking, urban-dominated economy, whatever the implications may have been on local culture (Howard 2009).

Studies focusing on this early period document a significant increase in the number of primary indigenous schools and indigenous students, although the source of this expansion and its overall impact on education outcomes are unclear (Brien 2002).⁵ In 1951, for instance, only one-fifth of school-age children in rural areas were enrolled in school (Contreras 2003). The second major push for the education of indigenous peoples, particularly for those marginalized as rural peasantry, occurred after the revolution of 1952, which succeeded with significant participation from Quechua and Aymaras. In the immediate aftermath of the revolution, the new Bolivian Code of Education (1955) implemented a national school network consisting of central and satellite units across the entire country, resulting in significant improvement in the school infrastructure. The Code was advanced on paper, including in its equal treatment of men and women with respect to access to education. Studies from this period, however, reveal that its implementation was quite limited and achieved mixed results. School enrollment as well as the establishment of schools in rural areas, for example, continued to increase, but not more rapidly than during the decade prior to the reform (Cajias 1998, Contreras 2003). Criticism during that period centered on the fact that urban and rural education systems were managed separately and

⁴ See Martinez (1997) for a detailed discussion of indigenous education in Bolivia during the early 20th century. As noted in Brien (2002) and documented by Choque (1994), the state was not able to expand school coverage prior to the reforms in the 1930s and 1950s, and indigenous communities were in charge of running schools in rural areas.

⁵ For example, Brien (2002) shows that the system of indigenous education expanded from 126 primary indigenous schools serving 8,491 pupils in 1943, to a system of 898 schools with an enrollment of 40,016 students in 1948. However, it is not clear what proportion of these schools were newly built by the state and what proportion were converted from older, indigenous-run schools in rural areas.

with different teacher qualification requirements; education in rural areas was exclusively in Spanish, of poor quality, not practical, and marred by teacher absenteeism (Contreras 2003).

In the 1980s, the education discourse in Bolivia moved toward greater recognition of indigenous languages and cultures. In particular, the increased political participation of indigenous groups and rural teachers during this period drew attention to demands for the recognition of the country's cultural and linguistic diversity more broadly, and the right of indigenous groups to education in their own language and observing their cultural context (PROEIB Andes 2000 and Cajías de la Vega 2013). This movement introduced intercultural and bilingual education into the pedagogical discourse and brought about important education programs for indigenous peoples. The latter included official resources to support literacy and teaching in three indigenous languages, as well as establishment of schools to implement and deliver bilingual and intercultural education to over 10,000 indigenous students (PROEIB Andes 2000, Platt 1987).⁶

While the shift from a Spanish-based curriculum to a bilingual and culturally-considered one took place only in select regions of the country, experiences from these and other independently-run efforts pushed for and informed the Educational Reform of 1994, which is a landmark in the history of education reform in Bolivia. Following the ideals put forth in the constitutional reform of that same year (which centers on the identity of Bolivia as a multiethnic and plurinational country), the new educational standards aimed to “improve the quality, relevance, access, and permanence of an education that is equitable, is intercultural, improves living conditions, promotes human development, strengthens participatory democracy, and increases the productive and competitive capacities of Bolivian men and women” (Ministry of Education of Bolivia 2004).⁷ The reform was designed as a three-phase program, with an emphasis on the decentralization of education, with pre-, primary, and secondary education placed under the responsibility of municipal governments; the concentration of investments on primary education, particularly in the infrastructure of schools (e.g., water, sanitation, and electricity); and an emphasis on bilingual education in rural areas. By 1997, one-quarter of primary schools in rural areas offered bilingual education (Ministry of Education of Bolivia 2004).

In line with this educational paradigm change, the literature on Bolivian education in the 1990s tends to be framed within the context of the implementation of bilingual and multicultural education. For example, some qualitative evidence suggests that bilingual and intercultural programs were not as popular as expected, because they did not offer much prospect of social mobility, as the demands of a Spanish-speaking economy remained unchanged (Howard 2009). Another study, unique in its treatment of Aymaras and Quechuas separately in the analysis, considers school attendance and delays, as bilingual education was heralded as a tool for closing ethnic and urban-rural education gaps particularly in these dimensions. It shows that geographic gaps remained large post-reform, and while gender gaps are generally small, the respective gaps for indigenous women and women in rural areas are much larger. Further, school access among

⁶ The *Servicio Nacional de Alfabetización y Educación Popular “Elizardo Pérez” (SENALEP)*, established in 1983, published resources to support literacy in three indigenous languages and a popular version of Spanish and trained teachers from within target communities to provide basic education in indigenous languages. This was followed by the *Proyecto Experimental de Educación Intercultural Bilingüe (PEIB)*, which, with support from UNICEF-Bolivia, offered bilingual and intercultural education to 10,000 children in 158 primary schools across the country (PROEIB Andes 2000, Platt 1987).

⁷ The education reform of 1994 was codified in the Ley de la Reforma Educativa No. 1565.

Quechuas is lower than that of Aymaras, which the authors argue may be in part due to the fact that Aymaras tend to have higher levels of community participation in education and are more likely to have bilingual programs (Jimenez 2004). Other studies show that enrollment gaps between indigenous and non-indigenous children and low- and high-income children also vary significantly by geographic area, though the decentralization of education brought about by the reform led to relatively more investment in the sector by poorer municipalities (Ochoa and Bonifaz 2002, Faguet and Sanchez 2008).

The next shift in the national educational discourse occurred under the government of Evo Morales, who replaced the Educational Reform of 1994 with a new set of reforms in 2010.⁸ While the details of these reforms are still not defined, they aim to transcend notions of human capital, democratization and citizenship that dominated the public discourse around the previous reforms, and instead, view education as paramount for community participation, wellbeing, and post-colonial liberation and cultural change (Howard 2009). Studies conducted since the early 2000s, nonetheless, still indicate that indigenous people continue to have lower primary and secondary enrollment and completion rates relative to their nonindigenous counterparts, even in urban areas where physical access is presumably similar for all groups (Jimenez and Vera 2010, World Bank 2014). Moreover, these gaps persist regardless of household income quintile, indicating that the barriers at play extend beyond availability and affordability, and may include cultural norms and social inclusion more broadly (Jimenez and Vera 2010, de Andrade Ramos and Cossío 2015).

Overall, the education landscape in Bolivia has had a turbulent past, and perhaps because of this, literature measuring outcome disparities within and across subgroups of the population is thin. Despite the fact that rural and indigenous education has been at the center of education debates for nearly a century, studies show that there remain significant differences across indigenous groups, and as will be shown below, *within* them. The underlying drivers of these differences, however, are not as well understood. While many empirical studies discuss education outcomes descriptively at a disaggregated level (e.g., by rural-urban, gender, wealth), there are, to our knowledge, no studies that use an intersectional approach to analyze cumulative disadvantages in education brought about by gender, group membership, and the intersection of both, in a multivariate setting. This is an important knowledge gap, not the least because education is often pointed as a key determinant of other outcome disparities in Bolivia (e.g., earnings, labor force participation, fertility choice, health; see Patrinos and Psacharopoulos 1993, Jiménez et al. 2006, Canelas and Salazar 2014, Ñopo et al. 2010). The present paper fills this gap by analyzing cumulative disadvantages by gender and ethnicity, as well as documenting their progression over time.

3. Data and Methodology

3.1. Data

⁸ The latest educational reforms were proposed in 2010 under the *Ley de la Educación No. 070, Avelino Siñani - Elizardo Pérez*, but they have not been fully rolled out.

This paper uses data from the 2012 Bolivia National Census of Population and Housing, which was collected in 2012 by the national statistical agency of Bolivia, *Instituto Nacional de Estadística* (INE). As a census, it covers over 10 million individuals in 2.8 million households throughout the country. It is a useful resource for identifying patterns of educational disadvantage faced by different groups, as it enumerates the entire population and reflects actual outcome disparities across Bolivia's population, as opposed to relying on assumptions for a sample drawn from it.⁹ The simplicity of the variables in the census also means that concerns regarding measurement error are not as relevant as they would be in a survey. However, the scope of the analysis is limited by the fact that the census includes only a few socioeconomic variables that can be analyzed as outcome indicators or included as control variables in regression analysis.

For the purposes of this paper, indigenous status is determined by individuals' self-identification of ethnicity in the 2012 census. A common alternative in the literature is to rely on other identity markers, such as language, religion, place of birth or phenotypic characteristics, even in contexts where ethnic self-identification variables are available, as the former are believed to be less malleable than the latter. Among these, language is the most widely used. In the context of Bolivia, the decision to use self-identification over language is motivated by the fact that, from the late 1950s to at least the 1980s, education of indigenous people was not only conducted exclusively in Spanish, but also aimed to spread its use. This might imply that some groups may have adopted Spanish as their primary language (this might especially be the case for Aymaras, for whom Spanish became an important tool for asserting their legal rights). In addition, massive urban migration, a dominant trend in Bolivia since the 1950s, makes it hard to identify groups on the basis of location in a precise way, while previous stigma associated with being indigenous may have led some indigenous groups to adopt Spanish as their primary language (Myers 1973). The recent rise of indigenous people in politics, including the election of an Aymara president in 2005, has arguably decreased the stigma of indigenous self-identification, and an element of efforts to empower indigenous groups has been to recognize their self-identification as members of such groups.¹⁰

This, however, does not mean that the decision to rely on self-reported ethnicity comes without drawbacks. For example, the share of self-reported indigenous people in the Bolivian population has decreased markedly between the last two censuses (2001-2012), consistent with the literature that shows that race, color and other self-identification indicators tend to vary across time, place, economic status, political discourses, among other factors (Telles and Paschel 2012). By using

⁹Carr (2013) argues that household surveys are more prone to underrepresenting traditionally excluded populations (e.g. people who live in fragile or disjointed households, slum populations, those who live in areas posing security risks, among others) compared to censuses. Surveys can also be more prone to issues of measurement error and sampling bias. However, as noted by Buettner and Garland (2008, cited in Carr 2013), it is also possible for censuses to exclude minorities, marginalized groups, non-citizens and specific categories of prisoners or rebels because of political reasons.

¹⁰As the Bolivian identity as a multi-cultural and pluri-national country has gained favor, individuals who are otherwise not tied to indigenous groups in terms of culture or ethnicity (though they may have some indigenous ancestry, as is the case of most Bolivians), may declare themselves as "indigenous" as a political statement of alignment with Bolivian ideals. This may be a particular trend for leftist urban intellectuals (Canessa 2007). If this is the case, however, our results underestimate the extent of indigenous disadvantage. It is also not clear if these people would declare themselves as "other indigeneous" or choose Aymara or Quechua. Further, our analysis controls for place of birth, which may address some of the bias introduced by this largely urban phenomenon.

self-identification, this paper emphasizes Bolivians’ current perception of self-identity, as reported in the 2012 census, even if doing so underestimates the size of the indigenous population relative to the previous census. This option is also preferred because it can only lead to an underestimation of the extent of disadvantage among indigenous groups.¹¹

3.2. Descriptive Patterns

According to the 2012 census, the Bolivian population is almost evenly divided between those who consider themselves to belong to an indigenous or Afro-Bolivian group (48.13 percent) and those who do not (46.76 percent). Within the indigenous population, two Andean groups, Aymara and Quechua, stand out as encompassing more than half of the indigenous population (Table 1). Both Aymara and Quechua people are concentrated in the Andean highlands, though the center of the Aymaras is El Alto, just outside La Paz, while Quechua populations are more spread out and represent the largest indigenous group in the departments of Cochabamba and Potosí (Figure 1). In addition to these two groups, there are approximately 30 officially recognized lowland indigenous peoples in Bolivia, who are mainly situated in the Amazon region, the East, Chiquitania and Gran Chaco. In Table 1, these groups are categorized into a single, “other indigenous” category, which comprises lowlands indigenous peoples, as well as indigenous groups that live elsewhere in the country, such as the Urus.¹²

Table 1. Distribution of Self-Identification Categories in Bolivia (percentage of total population)

	<i>Non-Indigenous</i>	<i>Aymara</i>	<i>Quechua</i>	<i>Other Indigenous</i>	<i>Afro-Bolivian/Other Ethnicity</i>	<i>Foreign/Not Listed</i>
Male	46.28	15.92	18.15	5.68	8.77	5.20
Female	47.23	15.79	18.30	5.34	8.30	5.03
Total	46.76	15.85	18.23	5.51	8.53	5.12

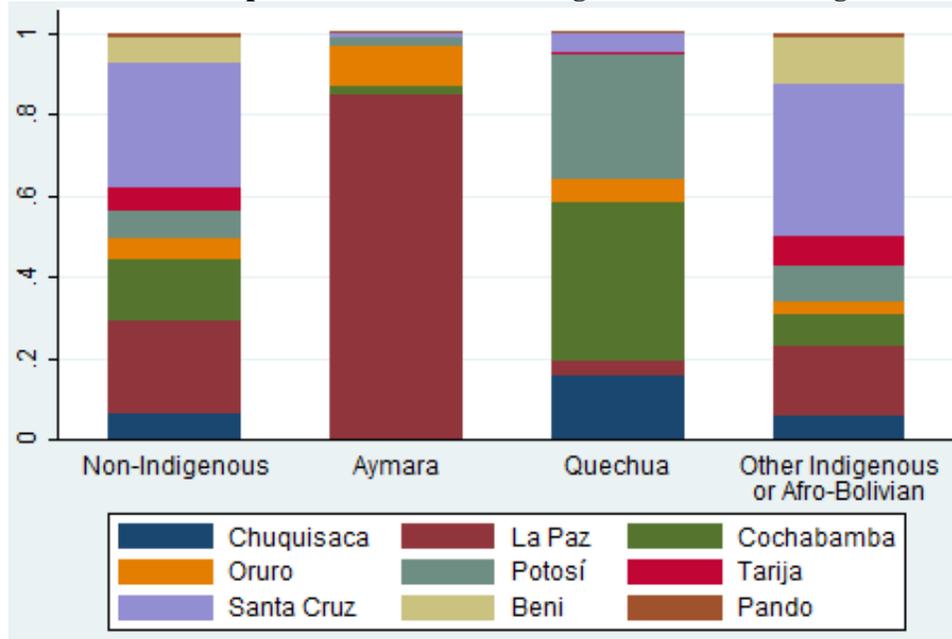
Note: This distribution of self-identification encompasses individuals of all ages, including those for whom another member of the household may have responded (e.g., small children).
Source: Bolivian 2012 census

¹¹ Previous censuses in Bolivia estimated the share of indigenous population to be over 60 percent (see Molina and Albó 2006, Jiménez et al. 2006), while the latest census predicts it to be around 50 percent. The findings of this paper should be interpreted as lower bound estimates, since if the actual population of indigenous groups is larger, the actual gaps between indigenous and nonindigenous people may be larger than recorded here.

¹² The decision to not limit the third group to only lowland indigenous people was due to two principal considerations: first, some indigenous groups are so small that they may not be officially recognized and/or there is not enough information to easily determine whether they are originally highland or lowland people; second, there are over 100 indigenous group identities declared in the census, but excepting Aymaras and Quechuas, no group comprises more than 3 percent of those self-identified as “Indigenous/Afro-Bolivian”. In fact, the next largest group in Bolivia after Aymaras and Quechuas is the Chiquitanos, a lowland people. As such, the results for “other indigenous groups” are unlikely to be driven by an Andean group.

As the outcomes of interest in this paper pertain to education, which is partly influenced by the availability of schools in each region, differences in the geographic concentration of each indigenous group is an important factor to consider. Previous literature also suggests that education outcomes in Bolivia vary by location (see, for example, Jiménez 2004, Ochoa and Bonifaz 2002, Faguet 2008). As seen in Figure 2, the census data confirm this observation, where individuals born in the departments of La Paz, Oruro, and Santa Cruz tend to have better education outcomes than those born elsewhere in Bolivia. This may be due as much to demand-side factors as to supply-side influences, including the availability and accessibility of schools, particularly for secondary education.

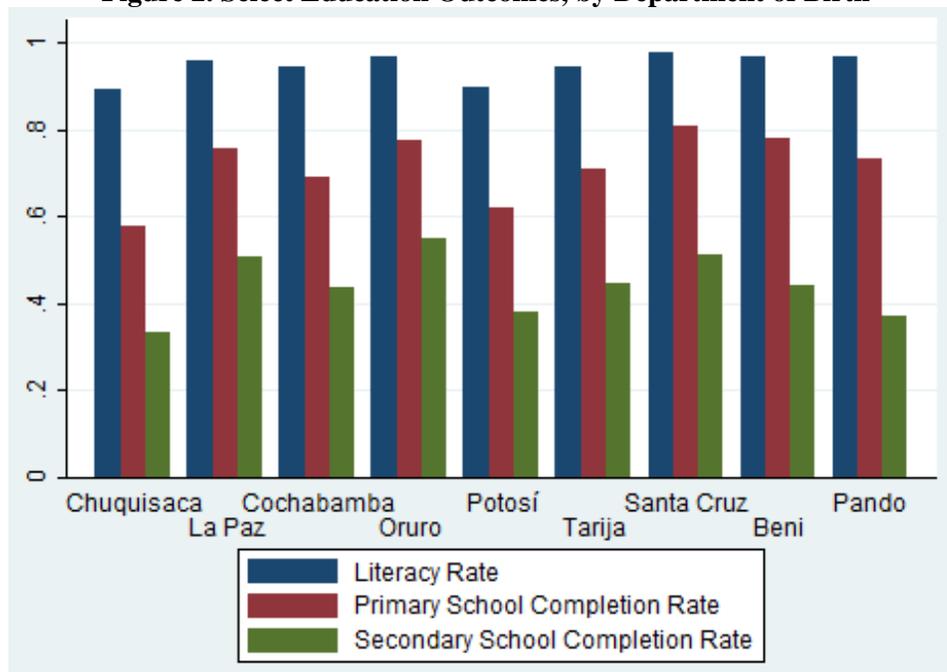
Figure 1. Distribution of Department of Birth for Indigenous and Non-Indigenous Populations



Source: Bolivian 2012 census.

In addition to geographic differences, the census data show that there are important differences in educational outcomes across indigenous and nonindigenous groups, as well as across men and women (Table 2). While over 80 percent of nonindigenous people over the age of 14 completed primary school, the respective share is 66 percent among Aymara and only 54 percent for Quechua. Even more striking is the gap across Aymara men and Aymara women, where the primary completion rate for men is 76 percent vis-à-vis 56 percent for women. Similarly, while almost one in two Aymara men completed secondary school, the same is true for only one in three Aymara women. Keeping in mind that the vast majority of Aymaras were born in the department of La Paz, which has a secondary school completion rate of 51 percent, this puts Aymara men close to the department average and women well below it. Moreover, the presence of gender-based gaps within the same ethnic group, whose male and female members tend to reside in the same geographic area, raises questions about purely supply-side explanations for educational disparities in Bolivia.

Figure 2. Select Education Outcomes, by Department of Birth



Source: Bolivian 2012 census.

Table 2. Outcomes by Gender and Ethnicity

Outcome		Non-Indigenous	Aymara	Quechua	Other Indigenous	Afro-Bolivian/Other Ethnicity	Foreign/Not Listed
Literacy Rate	Male	98.7	97.6	94.1	95.7	97.3	97.1
	Female	97.0	89.6	83.4	90.7	93.4	94.8
Primary School Completion	Male	86.2	75.9	59.9	70.2	75.8	81.2
	Female	81.5	56.4	47.7	62.6	69.0	76.7
Secondary School Completion	Male	61.6	46.1	30.1	36.1	45.8	52.3
	Female	58.1	31.8	25.2	32.0	41.9	48.8
Years of Education	Male	10.8	8.6	6.8	7.9	9.0	10.1
	Female	10.0	6.1	5.1	6.7	7.9	9.4

Note: Literacy rate for ages 12 and above. Primary school completion rate for ages 14 and above. Secondary school completion rates for ages 20 and above. Average years of education for ages 25 and above.

Source: Bolivian 2012 census

As discussed earlier, Bolivia has made significant progress in education over the last several decades, particularly in the expansion of education to rural and indigenous areas. Some of the

fruits of policies aimed at universalizing education are evident in the distribution of education outcomes by age cohorts (see Appendix A). For example, individuals 70 years of age or older completed an average of 4.4 years of schooling, while those between 50 and 59 completed 7.4 years and individuals aged 30 to 39 completed an average of 9.9 years of schooling. Education is a unique outcome in the sense that, for the vast majority of people, formal schooling is accumulated in the first couple of decades of life and remains constant afterwards.¹³ As such, in considering the educational attainment of individuals born in the 1950s, for example, one primarily observes schooling that was likely achieved in the 1950s-1970s, since few people return to school and progress in educational attainment after their 20s and 30s. Such generational differences can be seen particularly across the 70+ age cohort (who likely completed their education prior to the reforms brought about by the 1952 revolution) vis-à-vis those currently in their 30s (who went through the educational system at least partially during the 1980s).

Despite efforts to universalize education, however, the census data indicate that improvements were not uniform across gender and ethnicity, and several gaps remain, particularly in secondary school completion and years of education. Literacy rates have improved dramatically for all cohorts, including female Aymaras and Quechuas, so that while only one-fourth of women 70 years of age or older in those groups are literate, virtually all girls 12-19 years of age, both indigenous and non-indigenous, are literate. As such, the gap between groups in this dimension has closed. Similar progress has been made for primary school completion, as only one-fifth of Aymara and Quechua women aged 60-69 have completed primary school, but as many as nine-tenths of Aymara girls and four-fifths of Quechua girls aged 14-19 completed primary school. These gaps are even smaller among younger cohorts. In contrast, the rate of secondary school completion has unequivocally increased across age cohorts, but the gap between nonindigenous men on the one hand, and Quechua people on the other, remains large. Among those aged 70 or older, 35 percent of nonindigenous men and only 3 percent of Quechua women completed secondary school; the respective rates for those aged 20-29 is 71 percent and 44 percent, respectively, resulting in a gap of similar magnitude for both age cohorts. A parallel pattern occurs for years of education. Although the average has increased for both nonindigenous and indigenous groups, Quechua women in their 30s still have 4.9 fewer years of education than nonindigenous men, and, for those over 70 years of age, the deficit is 6.4 years.

Finally, considering gender-based differences *within* each indigenous group, the progress of Aymara men stands out from all other groups. Though the secondary completion rate of Aymara men 60+ is close to those of other indigenous groups (and much lower than their nonindigenous counterparts), it is clear that in the latter half of the 20th century Aymara men experienced a faster rate of gains in secondary school completion than other groups. For cohorts in their 20s and 30s, the secondary school completion rate of Aymara men stands closer to that of nonindigenous men and women than to those of any indigenous group. This trend is followed by a more recent one by Aymara women. While Aymara women in their 50s and older have the worst level of secondary school completion of all groups, those in their 20s have a completion

¹³ Education is different from a measurement of, say, access to health, housing or transportation services in that differences in access to any of these services today across cohorts do not necessarily carry information on previous access. An elderly person's current use of medical services, as collected in the census, does not provide information on her use of the same service during her youth, though the latter may have very important implications for the former. In contrast, an elderly person's current education level is likely to have been determined much earlier in life, and is an indicator (albeit with potential error) of her previous use of education services.

rate that is higher than Quechuas and other indigenous people, but still significantly lower than Aymara men as well as nonindigenous men and women.

Together, these patterns suggest that while the actual universalization of education may close gaps in achievement across gender and ethnicity, as shown by the progression of the literacy rate for each cohort, any shortfall in complete coverage is likely to be borne primarily by indigenous people.

3.3. Empirical Model

The empirical model used in this paper seeks to tease out the role of self-identified ethnicity and gender, both separately and jointly, in the observed education outcomes across different indigenous groups and age cohorts. To study this, an extension of the econometric model proposed by Taş, Reimão and Orlando (2014) is adopted. This model uses binary variables and interaction terms to quantify the penalty of being female and a member of an indigenous group, with respect to the reference group, which is nonindigenous men.¹⁴ The reduced form model is given by:

$$EDU_i = f[\alpha + \beta_1 G_i + \beta_2 A_i + \beta_3 Q_i + \beta_4 I_i + \beta_5 (G_i * A_i) + \beta_6 (G_i * Q_i) + \beta_7 (G_i * I_i) + \gamma X_i + \epsilon_i],$$

where EDU_i is the education outcome of interest; G_i is a dummy variable equal to zero if individual i is male and one if female; A_i indicates self-identification as Aymara; Q_i self-identification as Quechua; and I_i self-identification as an indigenous person other than Aymara or Quecha. X_i is a vector of control variables, which includes age and age-squared as well as a set of 115 dummy variables indicating individual i 's province of birth.¹⁵ The control variables include place of birth in order to account for the fact that people born in urban areas or areas with better infrastructure and/or education systems may have better outcomes than those born elsewhere. This is a particularly important control if place of birth not only affects education outcomes, but is also correlated with ethnicity. This has been shown to be the case in Bolivia, since the Aymara population tends to be concentrated in the department of La Paz, where education outcomes are above the country average.¹⁶

¹⁴ Note that this empirical strategy is suitable for studying the role of intersectionality on basic outcomes, such as education, where methods that use a form of matching [e.g. Oaxaca-Blinder (Oaxaca 1973, Blinder 1973) or matching comparisons (Ñopo et al. 2010)] cannot be reliably employed. This is particularly pertinent for census data, which generally does not include variables (e.g., poverty at birth or parental education level at birth) that could serve as a good basis for matching when considering basic outcomes. More specifically, the current paper is particularly interested in education as an outcome, while education tends to be included in the matching characteristics when using these alternative methods. For more details, see Taş et al. (2014).

¹⁵ There are currently 112 provinces in Bolivia; the slightly higher number is explained by a very small number (<.01 percent) of respondents who were born in provinces that no longer exist due to changes in administrative divisions over the last century.

¹⁶ The regressions were also carried out using a dummy variable for rural residence, along the lines employed in Taş et al. (2014). The results are the same in sign and very similar in magnitude to the ones presented below. The specification presented in this paper is preferred, however, as place of birth is exogenous, while *current* urban/rural residence may depend on the education outcome itself, as more educated people may be more likely to migrate from urban to rural areas relative to less educated individuals. Regressions were further carried out using separately the subsample of individuals born in the departmental capital and those born elsewhere; the results are again qualitatively similar to those presented here.

The model presented above is estimated by a probit regression when considering literacy, primary school completion, and secondary school completion as EDU_i , and by a linear regression analogous to difference-in-differences when using years of education as the dependent variable. In the latter case, β_1 measures the difference in average years of education between nonindigenous men and nonindigenous women, while in the former case the marginal effect of G_i indicates the difference in the likelihood that a nonindigenous woman will be literate or have completed primary or secondary education relative to a nonindigenous man. In addition, in the probit models, the signs of a coefficient and of its respective marginal effect are the same, so that, when using any of the four dependent variables, $\beta_1 < 0$ indicates that non-indigenous women have a lower expected education outcome than non-indigenous men, all other things equal. The differentiated impacts of ethnic groups, similarly, are captured by β_2 , β_3 and β_4 (or the associated marginal effects), which measure the role of being Aymara, Quechua or other indigenous group on educational outcomes, respectively.

The cumulative impacts of gender and ethnicity on educational outcomes are captured by the interaction terms, with β_5 (or the associated marginal effect) showing the *additional* effect of being both female and Aymara on education outcomes ($G_i * A_i = 1 \Leftrightarrow G_i = 1 \wedge A_i = 1$). That is, in the linear model, the difference in years of education (controlling for age, age-squared, and place of birth) between Aymara women and nonindigenous men is $\beta_1 + \beta_2 + \beta_5$, while the gap between Quechua women and nonindigenous men is $\beta_1 + \beta_3 + \beta_6$. For women that belong to other indigenous groups, it is $\beta_1 + \beta_4 + \beta_7$. So, if β_5 is statistically significant and has the same sign as $\beta_1 + \beta_2$, then the cost (benefit) of being an Aymara woman is greater than the cost (benefit) of just being a woman, plus the cost (benefit) of being Aymara. In other words, there is a unique experience at the intersection of the two identities. The same holds for β_6 with respect to Quechua women and for β_7 with respect to other indigenous women.

Each of the four models discussed above are estimated separately for different age cohorts, allowing for the fact that penalties for gender, ethnicity, and their intersectionality may change over generations. In addition, separate analyses by cohort allow the province coefficients to vary over age groups, accounting for differences in the pace of change by location. Given the structure of the census data, the errors ϵ_i are clustered at the household level.

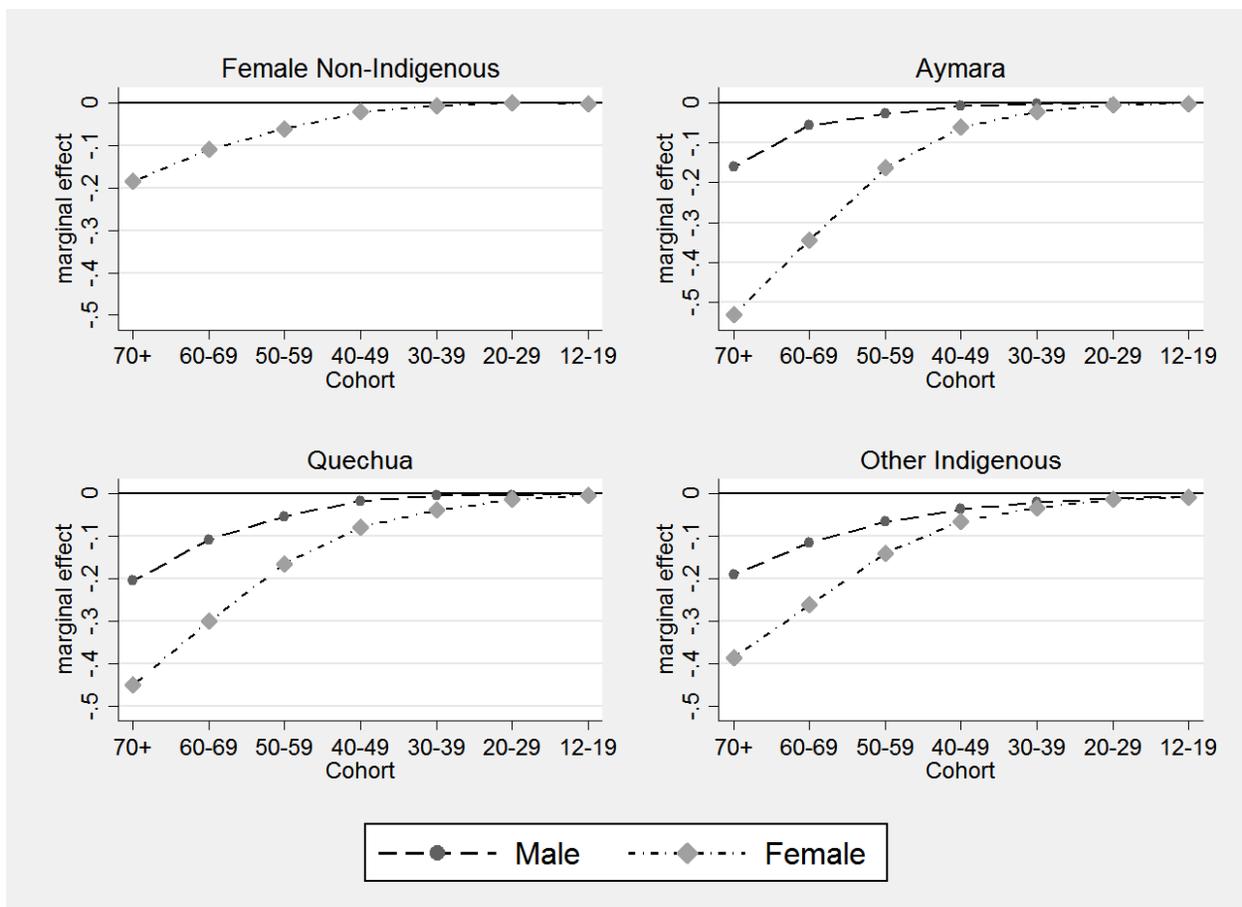
4. Results

The regression results are presented in four figures, as they are easier to visualize, showing not only the relative magnitude of each coefficient, but also trends over different age cohorts across different subgroups. The full regression results, including a summary table showing the comparable sizes of cumulative educational disadvantages of females from different ethnic groups and age cohorts (relative to nonindigenous men), are presented in Appendix B. Across models, almost all of the estimated coefficients are statistically significant at the 99 percent confidence level. It is important to recall that the coefficient estimates and associated marginal effects are based on the full census data, and as such, they are not prone to questions of external validity.

In Figures 3-6, the estimated marginal effects (for literacy and primary and secondary school completion) or estimated coefficients (for years of education) are plotted separately for each ethnic group. They are benchmarked against the horizontal line at zero, which represents the reference group, nonindigenous men. For indigenous women, the plots incorporate the *sum* of all three effects—the marginal effect of being female; the marginal effect of being Aymara, Quechua or other indigenous; and the marginal effect of being female *and* Aymara, Quechua or other indigenous. Hence, for indigenous women, the distance between the horizontal line at the top and the plotted line reflects *cumulative* educational disadvantage relative to nonindigenous men. On the other hand, distances between the plotted lines for men and women represent the intra-ethnic gender gaps for a given indigenous group, as measured against nonindigenous men.

The estimated marginal effects for literacy are presented in Figure 3. The figure indicates that the effect of being both female and Aymara has a more-than-additive effect on literacy rates for older generations, while gender- and ethnicity-based gaps are smaller among younger generations. For example, among individuals 70 years or older, nonindigenous women are 18 percentage points less likely to be literate than nonindigenous men (panel 1), controlling for age, age-squared, and place of birth, whereas Aymara men are 16 percentage points less likely to be literate (panel 2). Aymara women, however, experience an *additional* 19 percentage point penalty in addition to the impacts of gender and ethnicity alone, which translates into a cumulative disadvantage of 53 percentage points ($18+16+19=53$; panel 2). At the other end of the spectrum, the corresponding gap is less than one percentage point for the youngest cohort, 12-19 years old, not just for Aymara but also for Quechua and other indigenous groups, as younger generations have reached almost complete literacy across the board.

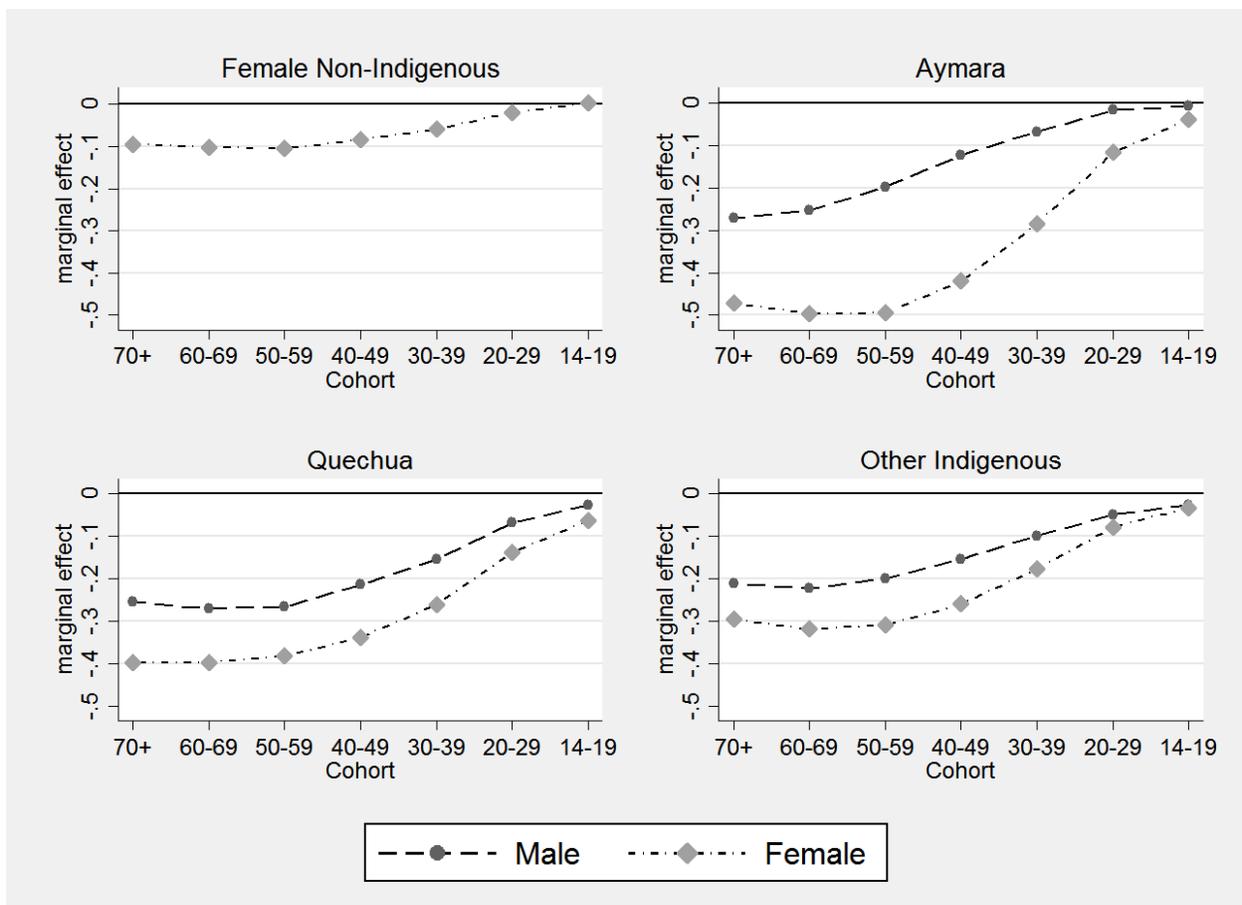
Figure 3. Marginal effects on literacy, by age cohort, using nonindigenous men as reference group



Note: Regressions for these results included individuals age 12 and above.

The two extreme cohorts present similar patterns for primary school completion. On one hand, Aymara women over 70 years of age are 9.5 percentage points less likely to have completed primary school than nonindigenous men because they are female, 27.2 percentage points less likely because they are Aymara, and an additional 10.6 percentage points less likely because they are both female and Aymara. This implies a cumulative disadvantage of 47.3 percentage points relative to nonindigenous men. On the other hand, for the youngest cohort, nonindigenous women are 0.4 percentage points *more* likely to have completed primary school, while Aymara men are 0.9 percentage points less likely to have completed primary school than nonindigenous men. The additional cost at the intersection of female and Aymara is 3.4 percentage points, resulting in a cumulative disadvantage of 3.9 percentage points ($-0.4+0.9+3.4$). Comparing the disadvantages of Aymara men and Aymara women over time, it is seen that even though Aymara men closed their gap with nonindigenous men across generations, the gap between Aymara men and Aymara women actually widened for cohorts in their 50s and 60s. For Quechua and other indigenous groups, both men and women have gradually closed the primary school completion gap with respect to nonindigenous men, although at a somewhat smaller pace than Aymara.

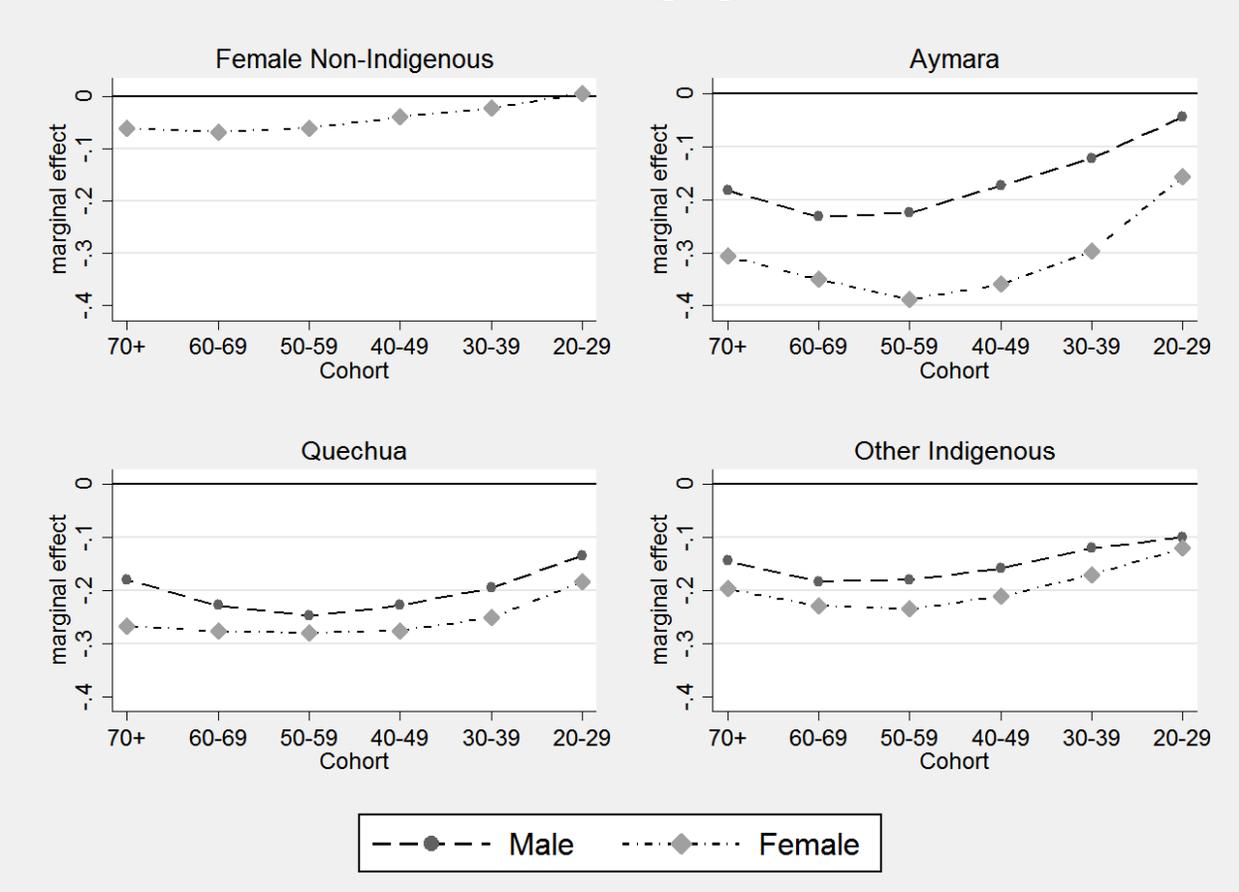
Figure 4. Marginal effects on primary school completion, by age cohort, using nonindigenous men as reference group



Note: Regressions for these results included individuals age 14 and above. All marginal effects are statistically significant at the 99% level.

There is less evidence, however, of intra-ethnic gender gaps closing in across age cohorts for secondary school completion. As shown in Figure 5, although every age cohort is more likely to have completed secondary school than the group before it, there is little change in the magnitude of the gaps between nonindigenous men and most other groups. A notable exception is Aymaras, especially when Aymara men are compared against Aymara women. Although the penalties for Aymara men and Quechua men are similar for those over 60 (around 20 percentage points), Aymara men in younger generations have dramatically closed the gap with respect to nonindigenous men in secondary school completion. In particular, Aymara men in their 20s are only 4 percentage points less likely to complete secondary school than their nonindigenous counterparts; in contrast, the penalty for Quechua men in the same age cohort is 13 percentage points. The same, however, cannot be said about Aymara women. The gap between Aymara women and nonindigenous men has decreased to some extent among younger cohorts, but still, in every age cohort, the gender gap in secondary school completion is still the largest among Aymaras as compared to all other groups. For example, not only do female Aymaras 50 years or older have the worst secondary school completion rate of all groups (Appendix A), but the gap between their achievement and that of their male counterparts has remained the largest among all groups.

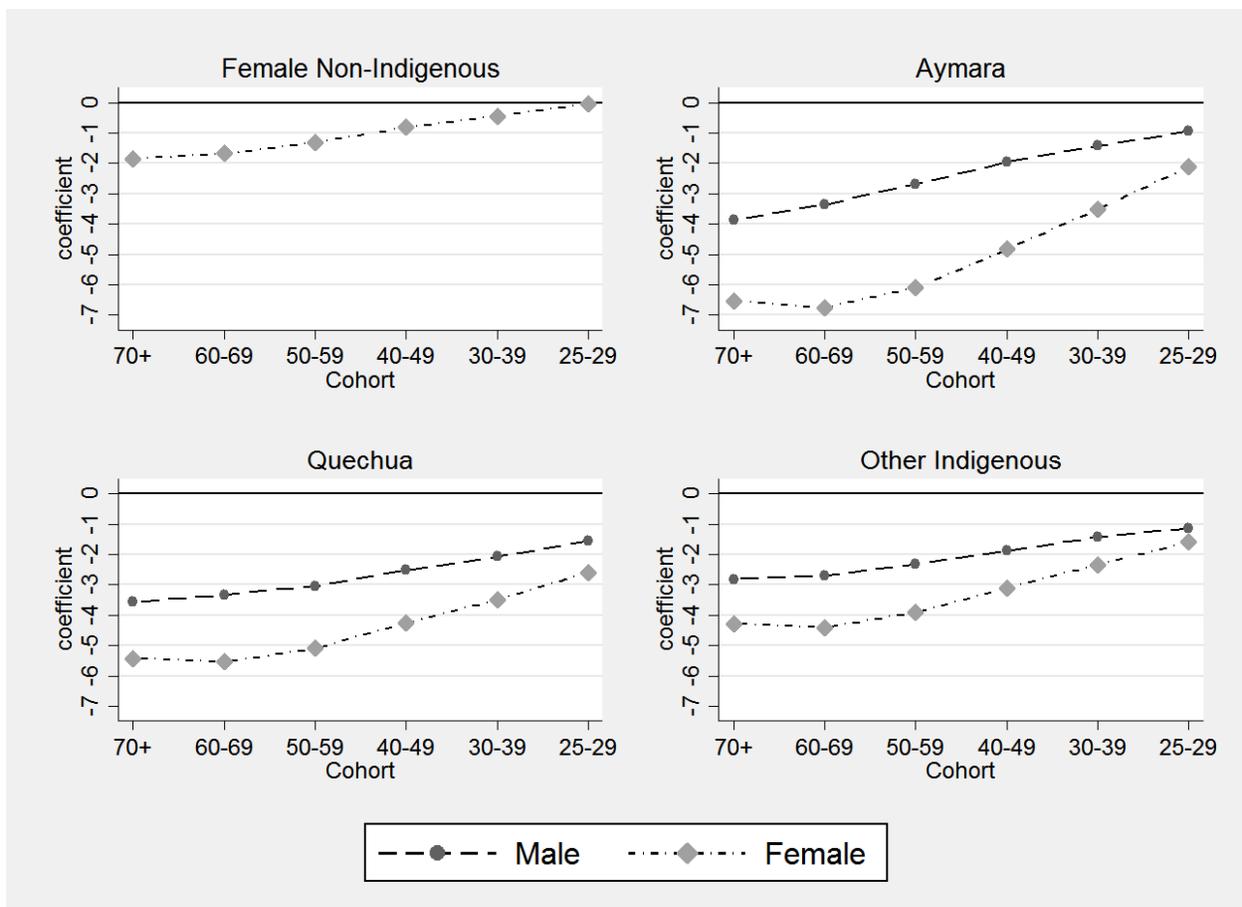
Figure 5. Marginal effects on secondary school completion, by age cohort, using nonindigenous men as reference group



Note: Regressions for these results included individuals age 20 and above. All marginal effects are statistically significant at the 99% level.

The final figure on years of education, Figure 6, carries patterns from both the primary school and secondary school completion results. It shows that, on one hand, all groups, including Aymara women, experienced relative improvements in years of education, which has narrowed the gap between them and nonindigenous men across generations. On the other hand, Aymara men continue to have completion rates that are closest to nonindigenous men, with a penalty of only 0.94 years among the youngest cohort. Meanwhile, Aymara women experience not only a small penalty of 0.05 years for being female, but also, an additional 1.1 years for being both Aymara and female, which results in a cumulative disadvantage of 2.1 years. Again, in all age cohorts, the gender gap is the largest among Aymaras.

Figure 6. Marginal effects on years of education, by age cohort, using nonindigenous men as reference group



Note: Regressions for these results included individuals age 25 and above.

These findings reveal several interesting trends pertaining to the evolution of gender gaps within and across indigenous groups in Bolivia. First, a comparison of Figure 3 and 4 implies that, while they have both decreased, the penalties experienced by each indigenous group and women have closed more slowly for primary school completion than for literacy rates. For instance, the gap in literacy for individuals in their 40s is relatively small, but differences in primary school completion are quite large for the same age cohort, and in fact, not so different from those in their 70s or older. Second, comparing these two figures with Figure 5 suggests that there has been some catch up in secondary school completion, but this has benefited only certain groups. Both nonindigenous men and women, as well as Aymara men, improved their outcomes more rapidly than women who belong to Quechua, Aymara and other indigenous groups. In fact, the deep bow shape in the plot of marginal effects for Aymara women in Figure 5 (and to a lesser extent, for the other indigenous group category as well) suggests that education policies of the 1950s-1970s (when individuals currently in their 50s and 60s were likely of school age) overlapped with an *increase* in the gap between nonindigenous groups and Aymara women. Finally, looking at the last figure on years of education, it appears that schooling has improved across the board for all groups, but Quechua women continue to be the most disadvantaged relative to nonindigenous men, whereas Aymara have the largest intra-ethnic gender gap.

Another finding that is worth highlighting concerns the relative contributions of gender and ethnicity to the cumulative educational disadvantages faced by indigenous women. Both Figure 4 and Figure 5 on primary and secondary school completion rates, and to some extent Figure 6 on years of education, suggest that in contrast to Aymara women, the vast majority of the educational burden faced by Quechua women comes from being Quechua rather than being female or being both Quechua and female. For example, in the 70 years or older cohort, Quechua women are 39.8 percentage points less likely to have completed primary school than nonindigenous men. Yet, only 9.5 percentage points of this cumulative disadvantage stems from being female and 4.9 percentage points stems from being both Quechua and female; the rest of it, 25.6 percentage points, is due to being Quechua. Similarly, in the youngest cohort, the penalty on primary school completion from being Quechua alone is 2.7 percentage points, compared to 0.8 percentage points for being Aymara alone. More generally, Figures 4-6 clearly indicate that of Quechua and other indigenous groups generally have lower attainment levels, but these levels are quite similar for men and women. For Aymara, however, the gender gap is considerably larger and largely accounted by the fact that the gap between Aymara men and nonindigenous men is much smaller than the gap between Quechua or other indigenous men and nonindigenous men.

5. Conclusion

The findings of this paper show that educational outcomes differ through the intersection of gender and ethnicity, resulting in cumulative disadvantages for indigenous women. They highlight the limitations of treating indigenous peoples in Bolivia as a single group, or even in only distinguishing between highland and lowland groups, as well as neglecting the role of ethnicity while examining gender-based disparities.

Education gaps have been historically large for Aymara women, who face a larger disadvantage relative to Aymara men, as compared with the corresponding gap between Quechua men and Quechua women. This is especially disconcerting when one considers the implication that while Aymara women and men are presumably equally likely to have been born in urban or any other educationally advanced areas, Aymara men have benefitted from these circumstances and reached education levels similar to those of nonindigenous men, even after controlling for age and place of birth. Aymara women, on the other hand, have not been able to emulate the same progress. While the educational disadvantage of Quechua men and Quechua women seems to stem from their indigenous identity, there seem to be unique gender dynamics within the Aymara population that result in a large cumulative disadvantage among Aymara women vis-à-vis Aymara men.

Although these findings document rather than provide explanations for gender- and ethnicity-based gaps observed at the national level, they do indicate potential paths for future exploration. Poverty likely poses significant limitations to indigenous education, resulting in intergenerational persistence of disadvantage. Similarly, gender gaps may arise if, in a situation with already more limited resources, families prioritize some children over others across gender lines. This decision may be the result of cultural traditions or it may be due to structural factors that reward lower returns to education for women or greater gains to Spanish fluency for men vis-à-vis women. As for the differences between the educational disadvantages of Aymara versus Quechua, perhaps the differences in these two groups' historical experience with education may explain some of

these observed patterns. For instance, the understanding of Spanish and, perhaps consequently, the Western education that comes with it, as a tool for defending their legal rights and navigating the Hispanic systems may have been a driving force for Aymara men in closing their education gap with nonindigenous men. This is corroborated by the steepness in literacy and primary school completion among Aymara men in older cohorts, as proficiency in written and spoken Spanish can be acquired at early levels of schooling. If men had traditionally represented Aymara against the government and local landlords, there may have been less incentive to increase female education.

Among younger cohorts, various other circumstances may be constraining the education outcomes of Aymara and Quechua women vis-à-vis all other groups. For example, previous literature suggests that school dropout rates especially for girls correlate with a range of factors, including distance, quality of education, early marriage and pregnancy, lack of separate sanitary facilities, son preference and division of labor within households, among others (Hunt 2008). Some of these factors become more binding as girls get older, resulting in wider gender gaps starting at the secondary level. Studies focused on Bolivia also highlight cultural differences across ethnic groups as an important source of the observed gender education gaps (Zapata 2011).

A recent survey conducted among Bolivian women in 2013 offers some additional possible explanations.¹⁷ For example, the survey found that women ended their education, even though they may have wanted to study more, primarily for financial reasons. Around 50 percent of women, both indigenous and nonindigenous, cited the lack of financial resources as the main reason their education stopped, which, combined with the fact that indigenous girls are more likely to be poor than nonindigenous girls, might partly explain why the education of indigenous girls is curtailed to a greater extent (or earlier in education) by financial constraints. Further, Aymara women in the sample were the most likely among all groups to say that their education ended because their family valued the education of boys more, while Aymara and Quechua were both more likely than nonindigenous women to say their education stopped because their families did not allow them to keep studying. Importantly, only 5 percent of women across all groups cited the lack of education services in their area as the main reason for the end of their education (World Bank, forthcoming).

These results may have repercussions for education and labor market outcomes, as well as for agency and wellbeing, as limitations in education carry through to individuals' opportunities and empowerment. As noted before, education tends to be accumulated early in life, so that gaps in education reflect not only current disadvantages but also penalties paid throughout one's life and by groups as a whole. Thus, the fact that Aymara women have been particularly disadvantaged relative to their male counterparts and given their place of birth, for instance, also signals the potential disadvantages they face in opportunities as they progress through life. Even as Aymara women have experienced some relative gains in recent years, similar concerns arise for younger

¹⁷ Though the survey, which covered over 2500 women, is not nationally representative, it provides results that can shed some light on the mechanisms behind the findings presented in this paper. The Perception Survey on Women's Exclusion and Discrimination explores the perception of indigenous and nonindigenous women's situation in Bolivia in the areas of education, health and economic opportunities, focusing on discrimination and exclusion. The survey was implemented between December 2013 and February 2014 by the Bolivian nongovernmental organization, *La Coordinadora de la Mujer*.

Quechua women. While there is some evidence to suggest that the education gaps have narrowed across younger generations, especially in terms of literacy, the existing gaps in primary and secondary schooling raise questions about the effectiveness of universal education and indigenous education programs in Bolivia that were implemented over several decades, particularly in how they have served Aymara women and other indigenous subgroups.

Finally, this paper highlights the importance of using an intersectionality lens in education interventions in Bolivia, since slow progress in overall education outcomes as well as inter-generational transmission of poverty within the Aymara and Quechua populations may stem from the fact that the heterogeneity of the indigenous groups is not receiving sufficient redress. In particular, these groups may be facing persistent barriers that are not being addressed by greater coverage or supply of schools, as evidenced by the educational disadvantage faced by Aymara women who mostly live in relatively urbanized areas. Educational attainment and the associated gender gaps may depend on historical experiences, cultural and social norms, discrimination, and observed returns to schooling, among others, and, as such, can differ within the indigenous population. From a policy perspective, interventions in education ought to take into account these differences between groups, as well as target their specific needs. A policy that aims to close gender gaps, for example, may focus on Aymara girls, while one that prioritizes closing deficits for indigenous groups may design a curriculum and approach that is more inclusive of Quechua people. Future interventions need to tailor the changes required for addressing these gaps based on a better understanding of diverse mechanisms that may be constraining Quechua and Aymara men and women's educational outcomes.

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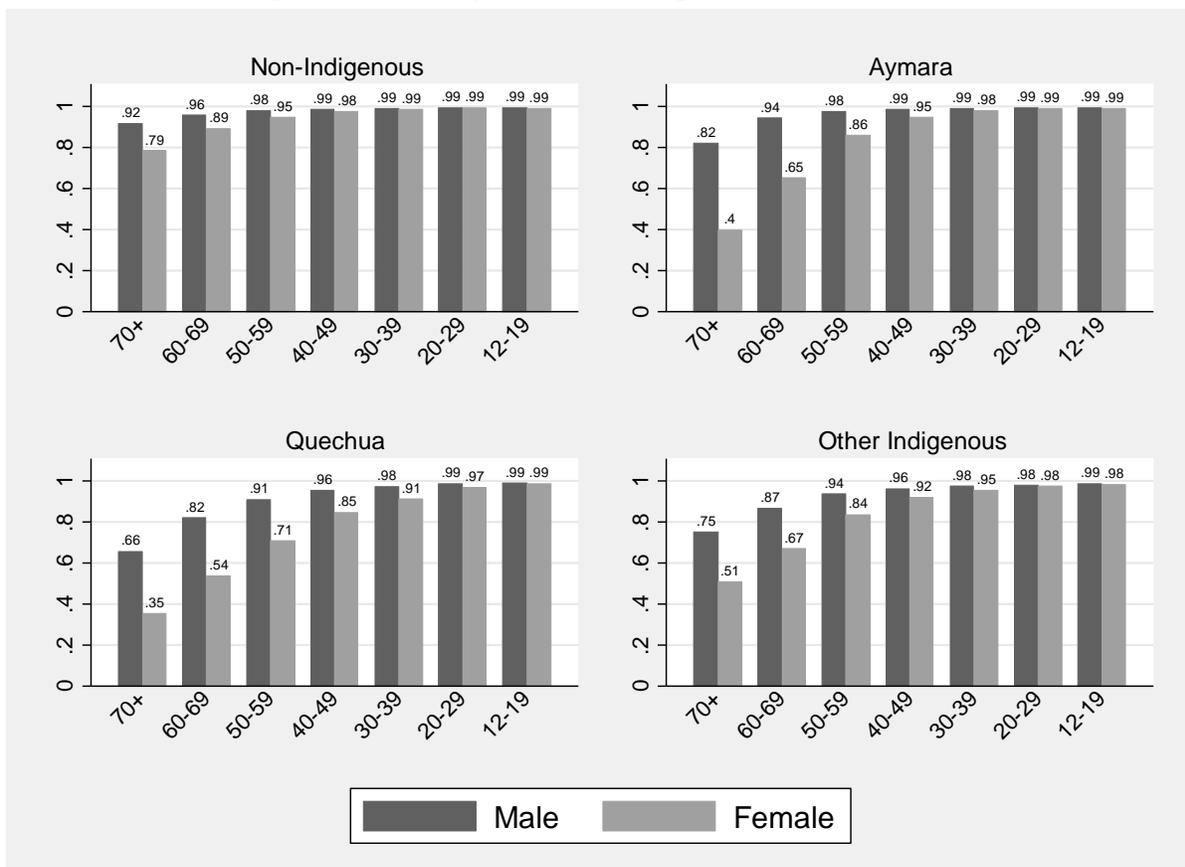
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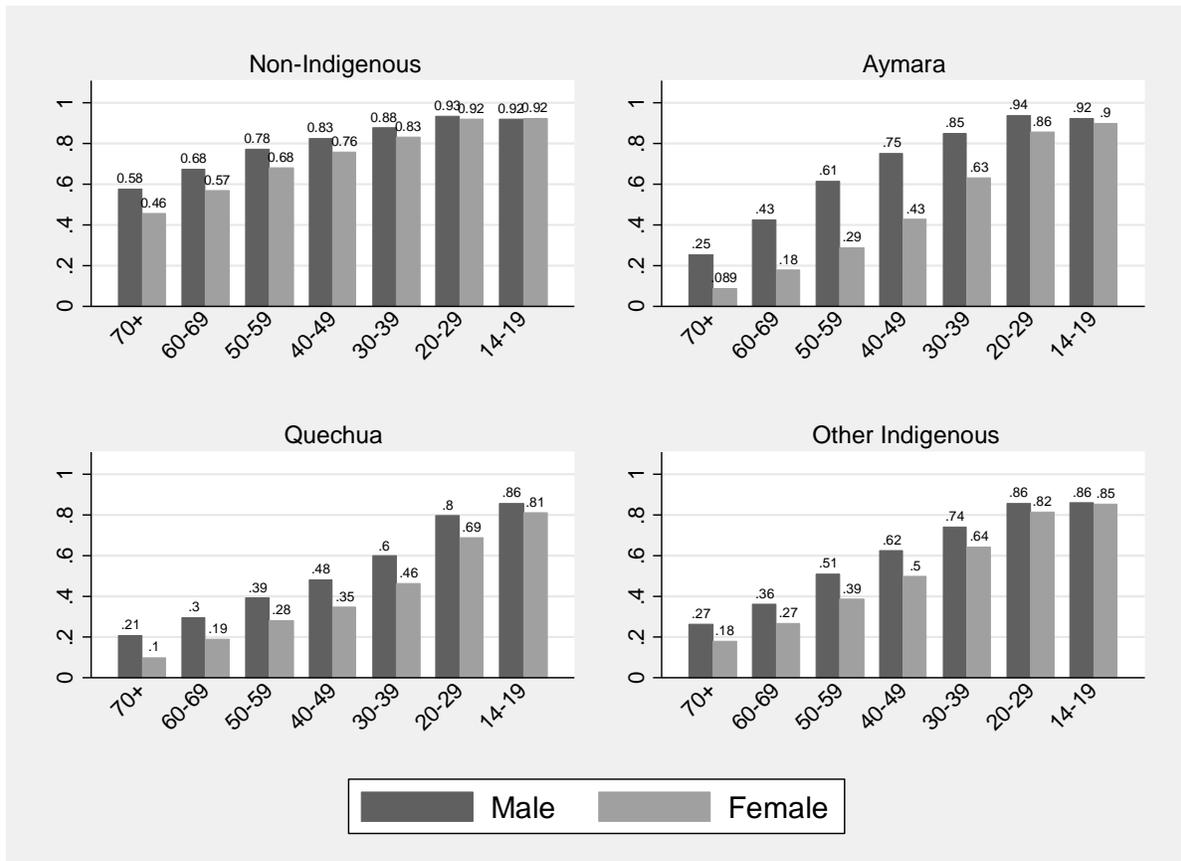
Appendix A: Educational attainment rates in Bolivia, by gender, ethnicity and age cohort

Figure A1. Literacy Rates by Group, Gender, and Cohort



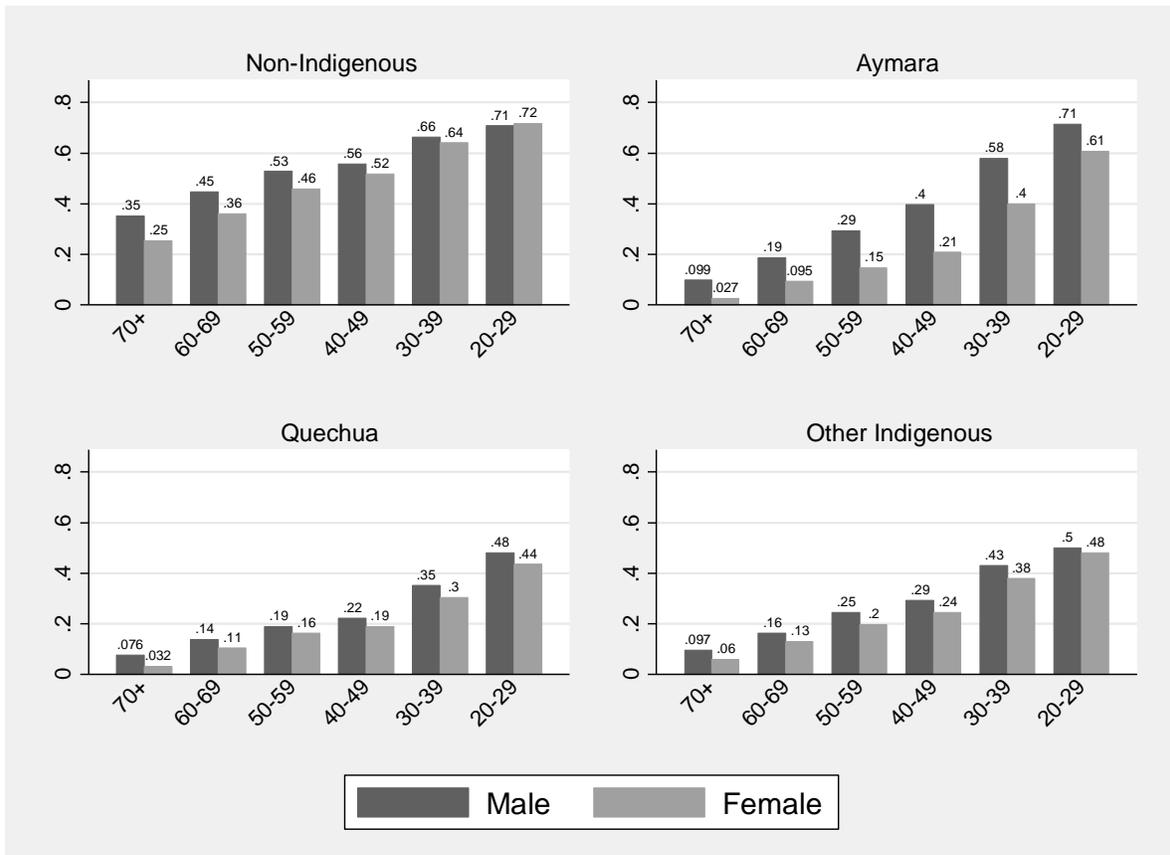
Source: Bolivian 2012 census.

Figure A2. Primary School Completion Rates by Group, Gender, and Cohort



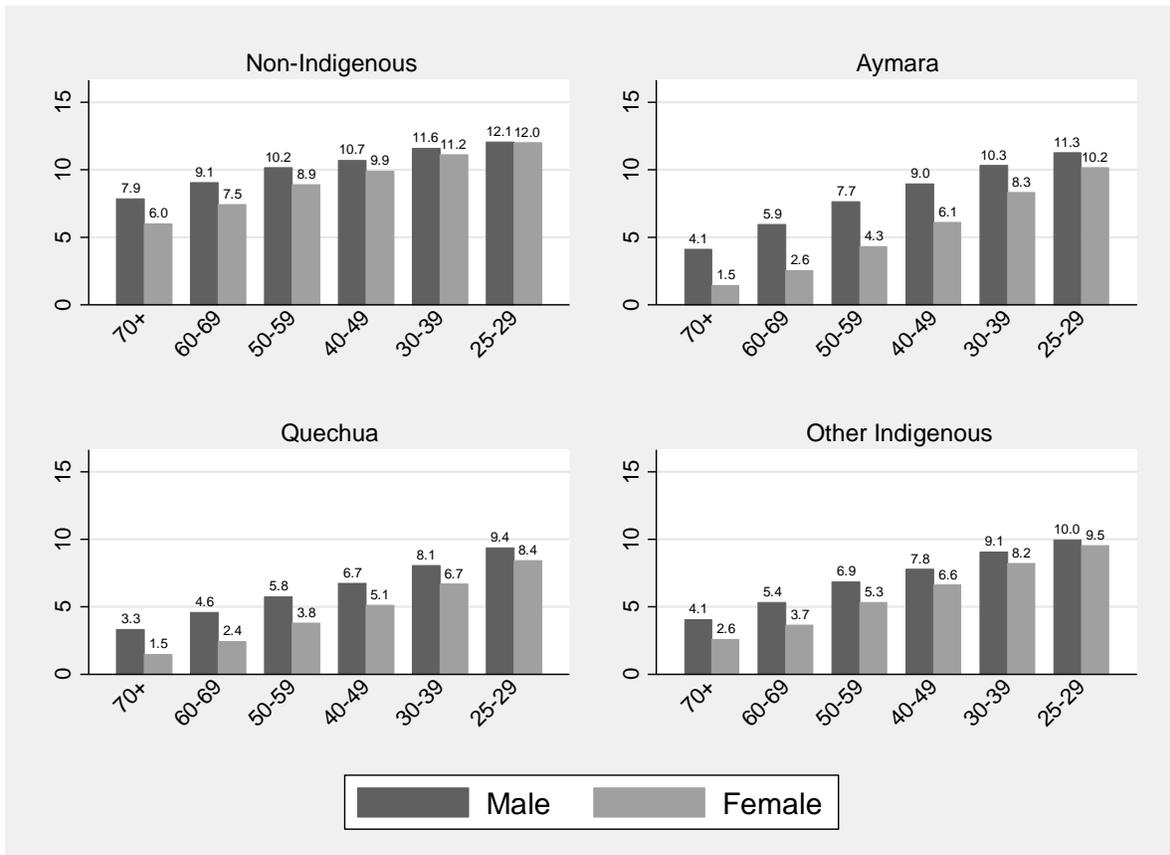
Source: Bolivian 2012 census.

Figure A3. Secondary School Completion Rates by Group, Gender, and Cohort



Source: Bolivian 2012 census.

Figure A4. Average Years of Education by Group, Gender, and Cohort



Source: Bolivian 2012 census.

Appendix B: Full regression results for literacy, primary and secondary school completion, and years of education

Table B1. Literacy, by Age Cohort

Marginal effects, using Non-Indigenous Men as reference group

	12-19	20-29	30-39	40-49	50-59	60-69	70+
Female	-.002 ***	-.001 ***	-.008 ***	-.022 ***	-.061 ***	-.110 ***	-.184 ***
Aymara	.000	-.001	-.003 ***	-.008 ***	-.028 ***	-.057 ***	-.161 ***
Quechua	-.002 ***	-.003 ***	-.005 ***	-.017 ***	-.053 ***	-.108 ***	-.205 ***
Other indigenous	-.007 ***	-.011 ***	-.020 ***	-.037 ***	-.066 ***	-.115 ***	-.190 ***
Female*Aymara	-.001 **	-.004 ***	-.011 ***	-.032 ***	-.075 ***	-.177 ***	-.187 ***
Female*Quechua	-.001 ***	-.010 ***	-.026 ***	-.040 ***	-.051 ***	-.083 ***	-.061 ***
Female*Other indigenous	-.000	-.002 ***	-.005 ***	-.006 ***	-.013 ***	-.037 ***	-.013 **
Obs.	1,431,126	1,531,898	1,170,985	853,078	622,001	419,181	350,089

Note: Regressions were carried out separately for each age cohort, and also included controls for age, age-squared, and province of birth. All cases in which the gender gap is greatest among Aymaras are highlighted in grey. ***p<0.01 **p<0.05 *p<0.10

Table B2. Primary School Completion, by Age Cohort

Marginal effects, using Non-Indigenous Men as reference group

	14-19	20-29	30-39	40-49	50-59	60-69	70+
Female	.004 ***	-.019 ***	-.059 ***	-.084 ***	-.105 ***	-.101 ***	-.095 ***
Aymara	-.008 ***	-.017 ***	-.068 ***	-.123 ***	-.198 ***	-.254 ***	-.271 ***
Quechua	-.027 ***	-.068 ***	-.155 ***	-.214 ***	-.266 ***	-.271 ***	-.255 ***
Other indigenous	-.026 ***	-.049 ***	-.099 ***	-.154 ***	-.199 ***	-.223 ***	-.211 ***
Female*Aymara	-.035 ***	-.081 ***	-.158 ***	-.213 ***	-.192 ***	-.142 ***	-.105 ***
Female*Quechua	-.040 ***	-.051 ***	-.047 ***	-.041 ***	-.011 ***	-.025 ***	-.048 ***
Female*Other indigenous	-.011 ***	-.011 ***	-.019 ***	-.022 ***	-.005 ***	.005	.010 *
Obs.	1,045,863	1,523,423	1,170,985	849,742	622,004	419,185	350,090

Note: Primary school completion is defined as the completion of the first six years of schooling, following the current school system (“primaria”). Regressions were carried out separately for each age cohort, and also included controls for age, age-squared, and province of birth. All cases in which the gender gap is greatest among Aymaras are highlighted in grey. ***p<0.01 **p<0.05 *p<0.10

Table B3. Secondary School Completion, by Age Cohort*Marginal effects, using Non-Indigenous Men as reference group*

	20-29	30-39	40-49	50-59	60-69	70+
Female	.006 ***	-.023 ***	-.039 ***	-.061 ***	-.068 ***	-.061 ***
Aymara	-.044 ***	-.122 ***	-.173 ***	-.225 ***	-.232 ***	-.183 ***
Quechua	-.134 ***	-.195 ***	-.228 ***	-.248 ***	-.228 ***	-.179 ***
Other indigenous	-.100 ***	-.120 ***	-.158 ***	-.180 ***	-.183 ***	-.144 ***
Female*Aymara	-.119 ***	-.152 ***	-.148 ***	-.102 ***	-.050 ***	-.063 ***
Female*Quechua	-.056 ***	-.033 ***	-.009 ***	.029 ***	.019 ***	-.027 ***
Female*Other indigenous	-.026 ***	-.027 ***	-.014 ***	.006	.022 ***	.008
Obs.	1,523,423	1,170,987	849,742	622,004	419,185	350,090

Note: Secondary school completion is defined as the completion of the first twelve years of schooling, following the current school system (“secundaria”). Regressions were carried out separately for each age cohort, and also included controls for age, age-squared, and province of birth. All cases in which the gender gap is greatest among Aymaras are highlighted in grey. ***p<0.01 **p<0.05 *p<0.10

Table B4. Years of Education, by Age Cohort*Coefficients, using Non-Indigenous Men as reference group*

	25-29	30-39	40-49	50-59	60-69	70+
Female	-.051 ***	-.441 ***	-.812 ***	-1.31 ***	-1.67 ***	-1.85 ***
Aymara	-.932 ***	-1.42 ***	-1.95 ***	-2.69 ***	-3.35 ***	-3.86 ***
Quechua	-1.55 ***	-2.08 ***	-2.52 ***	-3.04 ***	-3.33 ***	-3.57 ***
Other indigenous	-1.13 ***	-1.43 ***	-1.88 ***	-2.32 ***	-2.70 ***	-2.82 ***
Female*Aymara	-1.12 ***	-1.65 ***	-2.07 ***	-2.10 ***	-1.73 ***	-.832 ***
Female*Quechua	-.991 ***	-.983 ***	-.916 ***	-.755 ***	-.538 ***	-.007
Female*Other indigenous	-.419 ***	-.470 ***	-.414 ***	-.270 ***	-.046	.379 ***
Obs.	692,710	1,160,202	837,292	605,543	407,652	349,441

Note: Years of education defined by last year of schooling completed, including post-secondary education. Range from 0 to 17 (five years of university or other post-secondary education). Regressions were carried out separately for each age cohort, and also included controls for age, age-squared, and province of birth. All cases in which the gender gap is greatest among Aymaras are highlighted in grey. ***p<0.01 **p<0.05 *p<0.10

Table B5. Cumulative education disadvantage of females in Bolivia, by age and ethnicity*Using non-indigenous men in each age cohort as reference group*

	12-19	20-29	30-39	40-49	50-59	60-69	70+
Literacy							
Nonindigenous	-0.002	-0.001	-0.008	-0.022	-0.061	-0.110	-0.184
Aymara	-0.003	-0.006	-0.022	-0.062	-0.164	-0.344	-0.532
Quechua	-0.005	-0.014	-0.039	-0.079	-0.165	-0.301	-0.450
Other indigenous	-0.009	-0.014	-0.033	-0.065	-0.14	-0.262	-0.387
	14-19	20-29	30-39	40-49	50-59	60-69	70+
Primary School Completion							
Nonindigenous	0.004	-0.019	-0.059	-0.084	-0.105	-0.101	-0.095
Aymara	-0.039	-0.117	-0.285	-0.420	-0.495	-0.497	-0.471
Quechua	-0.063	-0.138	-0.261	-0.339	-0.382	-0.397	-0.398
Other indigenous	-0.033	-0.079	-0.177	-0.260	-0.309	-0.319	-0.296
		20-29	30-39	40-49	50-59	60-69	70+
Secondary School Completion							
Nonindigenous		0.006	-0.023	-0.039	-0.061	-0.068	-0.061
Aymara		-0.157	-0.297	-0.360	-0.388	-0.350	-0.307
Quechua		-0.184	-0.251	-0.276	-0.28	-0.277	-0.267
Other		-0.120	-0.170	-0.211	-0.235	-0.229	-0.197
		25-29	30-39	40-49	50-59	60-69	70+
Years of education							
Nonindigenous		-0.051	-0.441	-0.812	-1.310	-1.670	-1.850
Aymara		-2.103	-3.511	-4.832	-6.100	-6.750	-6.542
Quechua		-2.592	-3.504	-4.248	-5.105	-5.538	-5.427
Other indigenous		-1.600	-2.341	-3.106	-3.900	-4.416	-4.291

Note: Regressions were carried out separately for each age cohort, and also included controls for age, age-squared, and province of birth. Values show coefficients for years of education and marginal effects for literacy, primary school completion and secondary school completion. Primary school completion is defined as the completion of the first six years of schooling (“primaria”); secondary school completion is defined as the completion of the first twelve years of schooling (“secundaria”); years of education defined by last year of schooling completed, including post-secondary education, with range from 0 to 17 (five years of university or other post-secondary education). The second column shows coefficients for 25-29 age cohort for years of education only.