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Advancing Women's and Indigenous Groups' Educational Achievement: Changes in Outcomes following the 2017 *Ley de Gratuidad* in Chile

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Abstract: Who benefits when economic costs to the pursuit of higher education are diminished? Can such reforms advance the educational trajectory of historically marginalized groups, including women and indigenous people, or are historic social inequalities replicated in the use of new opportunities? The 2016 *Ley de Gratuidad* in Chile presents a unique opportunity to examine who benefits and how when the state provides a policy guaranteeing free higher education at participating universities. Given the systematic biases and cultural norms faced by women and indigenous people in Chile and the broad design of the state-led policy, the educational reform constitutes an important test of the extent to which lowering costs can facilitate education across an economically and socially diverse population. Leveraging data from two waves of a household survey, this paper finds that educational attainment, measured in the number of years of schooling achieved by respondents, is significantly higher for those who receive such a benefit, consistent with the design and intent of the policy. More surprisingly, these increases in years of education occur for women and indigenous people, even though no programmatic element emphasizes these groups. The results suggest that state financing is significantly associated with promoting higher education in the population and that women, the poor, and indigenous people are significant beneficiaries of this effect despite the social and cultural barriers in the country.

Keywords: education; gender; poverty; gratuity; Chile

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1. Introduction

Who benefits when economic costs to the pursuit of higher education are diminished? Can such reforms advance the educational trajectory of historically marginalized groups, including women and indigenous people, or are historic social inequalities replicated in the use of new opportunities? The 2016 *Ley de Gratuidad* in Chile presents a unique opportunity to examine who benefits and how when the state provides a policy guaranteeing free higher education at participating universities. Given the systematic biases and cultural norms faced by women and indigenous people in Chile and the broad design of the state-led policy, the educational reform constitutes an important test of the extent to which lowering costs can facilitate education across an economically and socially diverse population.

Indeed, Chile stands out for a number of reasons that make it important to examine. As a regional leader in economic growth, it has the resources to provide greater investment in the educational futures of its population. Likewise, over recent decades, its educational sector has grown to have numerous public and private universities and technical schools that can provide the needed education (Delisle and Bernasconi 2018). Nevertheless, Chile is marked by some of the highest and growing levels of economic inequality in the Americas and calls for change and inclusion have grown dramatically since at least 2011 (Hadzi-Vaskov and Ricci 2021). At the same time, Chilean society has been heavily marked by conservative gender norms, with expectations of women as caregivers and homemakers caus-

ing deprioritization in family educational goals, such that women's educational attainment has lagged behind that of men (Eyzaguirre and Vergara 2023; Calderón and Castells 2020; Singh and Mukherjee 2018). Further, indigenous groups have not been seen as key participants in higher education, and as a result, universities have been concentrated in Santiago and other cities, at some distance from traditional indigenous enclaves in the south of the country. Lower incomes in both groups, single women and indigenous people, serve as an additional barrier to education.

The free education policy introduced in Chile in 2016 sought to address just one problematic aspect of the higher education system: the cost of attendance. It legislated that attendance in participating universities, which had to be organized as non-profits and meet accreditation standards and opt into the program, would be free to qualifying students from lower-income strata (Delisle and Bernasconi 2018). The universities would subsequently be paid, according to a formula, for each student receiving such "free" education at their institution. Even though the activists who mobilized to demand that education be made free supported policies to address gender and racial inequalities in society, they did not frame "gratuity" as a key contributor to this effort. Thus, when adopted, the policy did not incorporate any explicit provisions targeting women or indigenous groups, and it remains an open question of how helpful—or not—the policy has been for these groups.

Exploring the gender and racial dynamics of the policy is particularly important. The design of the free education policy narrowly focused on family income as a barrier to university education, and it did not target the many social, cultural, and economic dynamics that have privileged men from dominant racial groups in the educational marketplace. This leaves open the likelihood that men would be the main beneficiaries of the gratuity benefit, taking it up in larger numbers and experiencing greater gains in their educational profiles from it. Women and indigenous groups might take it up more slowly or use it only to achieve similar levels of schooling as they had in the past. Abandonment by these groups might persist, even if doing so might leave them with less debt. Thus, it is essential to probe more deeply the extent to which women and indigenous people participated in the program and the subsequent increase (or lack thereof) in their educational attainment, as this would be the main avenue through which they would see changes in their life trajectories. This paper seeks to provide such an analysis, first examining the relationship of the policy with educational continuance overall, and then exploring the gender and racial associations, setting the stage for both further study and further policy development.

Leveraging data from two waves of a household survey early in the benefit's implementation, this paper finds that educational attainment, measured in the number of years of schooling achieved by respondents, is significantly higher for those who received the free education benefit, consistent with the design and intent of the policy. More surprisingly, these increases in years of education occur for women and indigenous people as well, even though no programmatic element emphasizes these groups. The results suggest that state financing can have a significant impact on promoting higher education in the population and that women, the poor, and indigenous people are significant beneficiaries of this association despite the social and cultural barriers in the country. It also allows us to suggest ways that the policy might be made even more effective for these groups.

The paper proceeds as follows. In the next section, we outline the social panorama of higher education in Chile. We draw on the literature on higher education as a means of social mobility and highlight the nature of Chile's tertiary education sector, as well as the many social, cultural, familial, and economic barriers that marginalized groups—especially women and indigenous peoples—face in pursuing education. We next describe the gratuity policy that emerged from the protests and sought to address the rising cost of university studies, and we detail its early performance in the first years of its implementation. Subsequently, we discuss our methodological approach, including our choice to examine individual-level years of schooling as a measure of the possible effects of the gratuity policy in its first years for those who received it, as well as the other variables we include in our analysis. In the following section, we present our findings through a series of econometric

models; these show that even though the policy did not have specific features to target either women or indigenous groups, those members of these groups who received the free education benefit did indeed experience an increase in their total years of schooling. Finally, we conclude with a discussion of the findings and their implications for future research.

2. The Social Context of the Introduction of the Free Education Policy in Chile

The social panorama in Chile is particularly interesting for this study given its economic, gender, and racial divides. On the one hand, Chile has long been hailed as one of the "success stories" of Latin America, marked by significant economic growth, a rise in incomes, and decreasing poverty over the decades since the 1980s when it undertook substantial market-oriented reforms. Yet, on the other hand, Chile has also been marked by high (and, in some years, increasing) levels of income and wealth inequality during this same period. Social programs introduced by successive governments proved insufficient to fundamentally change this, and by 2011, regular protests saw citizens taking to the street, demanding increased support for low-income Chileans and calling for changes to several aspects of the economic model (Hadzi-Vaskov and Ricci 2021).

One key aspect of the Chilean model has been a heavy reliance on the private sector, and this has affected nearly every segment of the economy, including the higher education sector. The sector has become populated by a mix of public and private institutions, with private education dominating both in terms of the number of schools (44 versus 18) and total enrollment (85 percent of students versus 15) (Delisle and Bernasconi 2018). Tuition tends to be among the highest in the world, with many students relying on loans or grants underwritten by the government to defray their tuition; to be eligible, they must achieve a minimum score on the national college admission exam, called the PSU, and these grants do not cover living expenses (Delisle and Bernasconi 2018). Studies show that this system of loans has left students carrying heavy debt burdens (Espinoza and González 2016; Guzmán 2011).

In 2014, discontent about educational costs and accessibility in the economy spread in a particular way to young people, especially university and secondary school students. Their experience of rising fees in schools and the overall increase in costs of living while pursuing a degree led them to engage in a prolonged series of school strikes. These "pingüinos" (so-called because of the school uniforms worn by the secondary school students) and the university students that were the public spokespeople for the movement called for a transformation of the Chilean educational system in order to lower the required fees and dismantle what they saw as the "privatization" of education in Chile through the growth of private schools (Salinas and Fraser 2012).

At the same time, some of the deeply conservative gender norms that had long predominated in Chile were increasingly called into question (Eyzaguirre and Vergara 2023), both by the "pingüinos" and society more broadly. Familial and social dynamics have long acted as a significant brake on women's job trajectories and education in Chile. For example, women in Chile are disproportionately represented in jobs with lower economic returns (De Paula 2018), and the gender pay gap they experience can be largely attributed to the socially gendered nature of certain occupations (OECD 2015). These social expectations especially affect women in the lower social strata (Calderón and Castells 2020; Singh and Mukherjee 2018). Women are often overrepresented in fields such as health and social work, which tend to have lower salaries. Women also tend to be underrepresented in science, technology, engineering, and mathematics (STEM) careers, which typically have higher salaries (Bordón et al. 2020; Eyzaguirre and Vergara 2023).

Similarly, a growing consciousness of the long-standing biases against indigenous peoples in Chile has led to calls for improved opportunities for members of the Mapuche (i.e., the largest indigenous group in Chile) and other tribes. Economically, the Mapuche enjoy fewer chances of upward social mobility compared to non-indigenous people of the same region (Cantero M. and Williamson C. 2009). Given such disparities, the widespread mobilizations sought better respect for indigenous customs and laws, state transfers to

indigenous regions, and increased educational possibilities to aid in career advancement. Activists and elected leaders observed that such efforts could contribute to a process of "decolonization", dismantling historically sexist and racist privileges and advancing the status and career opportunities of women and indigenous peoples.

It is important to note that indigenous women in Chile and in Latin America as a whole are a highly marginalized group. With their intersectional identity, they suffer a cumulative disadvantage not only from gender gaps and biases but also from the consequences of poverty and discrimination linked to their indigenous identity. Thus, they often have lower schooling indicators than non-indigenous women. For this reason, according to the International Work Group for Indigenous Affairs (IWGIA), indigenous women tend to have higher poverty rates than non-indigenous women in Chile: 18 percent versus 11 percent, respectively (IWGIA n.d.). More widely, across Latin America, the gap is even more pronounced: the poverty rate for non-indigenous women is 25 percent, while for indigenous women, it is 46 percent (CEPAL n.d.). Notably, even when racial prejudices are overcome to participate in the economy, indigenous women often face entrenched gender roles (i.e., "machismo") that steer them into traditional roles that hinder higher education (González et al. 2016, 2022). The struggle of first-generation indigenous women to "stay in" higher education institutions is thus particularly challenging (Webb 2018).

Furthermore, the challenges of indigenous women do not end in "staying in" higher education. The process of higher education entails balancing racial identity, adapting to mainstream culture, and attributing meaning to the resources their communities invest in them (Webb and Sepúlveda 2020). Ávila Reyes et al. (2021) have found that indigenous students perceived themselves as underprepared for college given their high school education. Sepúlveda and Lizama-Loyola (2022) show that unequal starting positions, such as being an indigenous woman, can lead to a sense of unwelcomeness in academic and professional environments, which further limits life outcomes. Rodríguez and Archer (2022) further highlight the role of (Chilean) "whiteness" in reproducing privilege and exclusion of underrepresented groups. Specifically, they document instances of white women, perceived as "more attractive", receiving preferential treatment, such as being asked easier questions during oral examinations.

In sum, this review of the social context in Chile prior to the educational reform highlights that the issues raised by the protesters, especially the "pingüinos" and their university student comrades, were far deeper than simply the cost of higher education. They point to a host of prevailing social norms, familial and cultural expectations, and entrenched processes that systematically limited the opportunities of women and indigenous people—both in their careers and in their educational pursuits. Given how deep these ideas and practices run, the ability of an educational reform focused on cost to measurably improve the educational attainment and well-being of women is very much an open question.

3. The Introduction of the Chilean Free Education Policy

In an unprecedented move in 2014, the government engaged in negotiations with the protesters, and significant reforms were undertaken over the subsequent years on a number of fronts, most especially to address both the cost of enrollment and the dynamics of private education more broadly. Among the most significant reforms was the free education law which, although it focused narrowly on the cost of education, was presented as having the potential to address other long-standing social deficits in Chilean society.

The "gratuity" (as the Chileans refer to it) policy was introduced during the second government of Michele Bachelet (2014–2018). In 2016, the policy was extended to students from the lowest five deciles of family incomes, and by 2018, this was raised to the lowest six deciles; both new students and current students were eligible from the time of enactment (Delisle and Bernasconi 2018). Public universities were required to follow the guidelines of the policy, such that they had to waive the tuition for students receiving the benefit and wait to be reimbursed directly by the government, while private institutions had the option to follow the policy if they were organized as a non-profit and met accreditation

standards. Each school is paid on a per-student basis by the government according to a formula. Most private institutes and technical training centers were excluded from the policy initially, as many did not meet the accreditation requirements or were organized as for-profit enterprises (Delisle and Bernasconi 2018). Likewise, in the early years, at least three of the private universities chose not to participate, perhaps because they typically enroll more affluent students and have higher tuitions that would not be fully compensated by the government subsidy. In its first year of implementation, 2017, the gratuity policy financed over 260,000 students attending state and private universities, with about half of all schools participating (Brunner and Labraña 2018; Ministerio de Educación 2017). Overall, the number of individuals represented 22% of the total enrollment in 2017 (CNED n.d.)

Thus, while "gratuity" did not make Chilean higher education fully free or universal as proponents had hoped, it did add a critical alternative to loans granted by private banks and backed by the state, which had been central to the previous Chilean educational finance system. Recent studies have begun to probe the impact of the gratuity policy, with promising early findings. Early beneficiaries of the gratuity policy seem to have overwhelmingly come from segments of the continuing student body that had previously relied on loans to finance their educations (Delisle and Bernasconi 2018). In addition, using administrative data from college enrollment, Espinoza et al. (2022) found that the enrollment rate of first-generation students was marginally higher than in the past.

Yet, given the wide gap between gendered educational attainment and income, and the racial inequality embedded in Chilean social relations, further inquiry is needed to understand the extent to which marginalized groups may have benefited from the free education policy. Though the policy did not explicitly name or target such groups, proponents were hopeful that women and indigenous groups would see particular gains. Indeed, the gratuity helps eliminate or diminish some of the most significant barriers to continuing education for both women and indigenous groups. Given the economic pressures these groups face and their concentration in the lower income deciles, they may have seen particular gains when they receive the gratuity. Alternatively, social and cultural challenges might prevail, complicating the ability of women or indigenous peoples to take advantage of free educational opportunities, or they may do so in ways that only replicate previous achievements, dropping out (albeit with lower debt) at the same time and pace as in the past.

To summarize, the hypothesis our paper tests is whether or not the reception of the free education benefit is associated with increased educational attainment, measured in the number of years of schooling completed, for those who received it. We take as the null hypothesis no change in educational attainment. Policymakers and proponents expected the policy to have a positive association. Less certain was whether or not traditionally marginalized groups would also experience this positive association, so we also test hypotheses for a positive relationship for women and for indigenous people (and indigenous women). The next section of the paper thus looks to individual-level experiences of education to gauge the policy's effectiveness.

4. Materials and Methods

This paper employs individual-level survey evidence to examine the relationship between the reception (or not) of the gratuity policy on individuals with diverse demographic characteristics, with a particular interest in the policy's possible effects on the educational attainment of women from low-income backgrounds. Examining such individual-level data is particularly appropriate to the question at hand: whether or not those who received the benefit saw increases in their overall number of years of schooling. It permits comparisons with similar individuals—in terms of sex, age, and indigenous status—who did not receive the benefit, as well as across these groups. In the following paragraphs, we describe the survey data used, the variables employed, and our choice of modeling strategy.

5. Procedures

Our main data source is the Social Characteristics Survey (CASEN for its initials in Spanish) household survey, which has been conducted by the Chilean Ministry of Social Development since 1985 to learn about the situation of households and to implement appropriate public policies. This cross-sectional survey provides representative estimates of Chilean's social reality given its sampling design: probabilistic, multistage, and stratified, considering the geographical area, population size, and urban–rural areas. Since its creation in 1985, the survey has been carried out every two or three years, and waves have varied somewhat in the questions asked based on the issues raised by the design team. We employ the survey waves from 2015 and 2017, merging them into a single database, following the procedure described by Lumley (2010, p. 98) to adjust the merged weight. Unfortunately, the subsequent wave of the CASEN survey (i.e., CASEN 2020) did not include the variable of interest for this study (due to significant changes to the survey in response to the COVID-19 pandemic), so no later data are available for comparison. Our merged dataset includes 483,407 sampled persons in households to represent the Chilean population. Table 1 provides descriptive demographic characteristics of the respondents. As can be seen, the sample shows similar values for women and men, allowing for meaningful comparisons between these groups later in our analysis.

Table 1. Demographic characteristics of CASEN respondents, 2015 and 2017 combined.

	Men	**Women**
	Respondents' demographic information	
N	230,914	252,493
Poverty	26,389 (11%)	31,131 (12%)
Indigenous	27,262 (12%)	30,393 (12%)
Gratuity [a]	1382 (5.7%)	1458 (5.9%)
	Respondents' descriptive statistics	
Age	36 (23)	38 (23)
Years of education	10.7 (4.2)	10.6 (4.3)

Note: N represents the total number of respondents of the 2015 and 2017 CASEN surveys. The rows corresponding to "Poverty", "Indigenous", and "Gratuity" show the number of respondents with the corresponding percentage in parentheses. The central tendency statistics for "Age" and "Years of Education" are reported as mean and standard deviation. [a] The number of respondents shown in the "Gratuity" row only includes individuals between the ages of 17 and 25 who receive the gratuity benefit.

6. Model and Analytical Strategy

Table 2 (below) shows the descriptive statistics of the variables employed in the models of the study. Our principal dependent variable of interest is Years of Education (range 0–22), a continuous variable that reports the number of years of education completed by the respondent at the time of the survey. We choose this variable—rather than the highest level of education attained—because it is fine-grained enough to detect changes even in the first years following the introduction of the gratuity policy. Further, both globally and in Latin America, the economic returns to every additional year of schooling have been shown to be significant (Manacorda et al. 2010; Psacharopoulos and Patrinos 2018). We construct models to understand which characteristics are associated with increases or decreases in years of education, such as sex, income level, indigenous status, parental education, and—most importantly—reception of the gratuity.

To carry out this analysis, among our explanatory variables, we employ a variable for Women, which is a dichotomous variable based on the reported gender of each respondent, taking on a value of 1 for women and 0 otherwise. Given the long trend of lower educational attainment for women due to the social and economic forces detailed above, our expectation is that this variable will have a statistically significant, negative sign. Yet, educational enrollments have greatly increased in recent years (CNED n.d.), so a non-significant or even positive association may be detected.

Table 2. Summary statistics.

Variable	Mean	SE	Min	Max
Continuous				
Years of Education	11.081	0.027	0	22
Age	36.609	0.084	0	117
Dichotomous				
Father Higher Ed	0.111	0.002	0	1
Mother Higher Ed	0.078	0.002	0	1
Indigenous	0.093	0.001	0	1
Poverty	0.101	0.001	0	1
Gratuity	0.015	0.000	0	1

Next, since the gratuity policy was particularly targeted at the lower deciles of the income distribution, we seek to understand the relationship of income to educational attainment. We employ the variable Poverty, a dichotomous variable based on the CASEN survey that classifies people living in poverty and extreme poverty based on their reported income. In our case, the variable takes the value of 1 if the respondent is living in poverty or extreme poverty. The poverty threshold is defined as the monetary value that prevents an individual from meeting essential food and non-food requirements, and extreme poverty is defined as living with less than two-thirds of the poverty line (CEPAL 2015, 2017). Our expectation is that poverty is associated with lower educational attainment in the absence of receiving the gratuity benefit.

In order to understand the effect of being a member of an indigenous group, we introduce a dichotomous variable, Indigenous, that takes the value of 1 if the respondent self-identifies as a member of one of Chile's indigenous communities. Given the long association of lower educational attainment with indigenous identities, due to the social and cultural factors discussed earlier, we expect the coefficient for this variable to have a negative sign in the absence of reception of the gratuity benefit.

Empirical evidence has shown that having parents with higher education is associated with the greater educational attainment of their children (Chesters 2015; Mullen et al. 2003). To test for this effect, we introduce two dichotomous variables, Father Higher Ed and Mother Higher Ed, which take the value of 1 if the respondent has a father or mother with a tertiary degree (i.e., higher technical degree, undergraduate or graduate degree). Our expectation is that this variable will be positively associated with educational attainment, measured by total years of schooling.

Our main independent variable of interest is the reception of the benefits of the gratuity policy. Gratuity is a dichotomous variable that takes the value of 1 if the respondent received the benefits of the gratuity educational policy. Gratuity takes the value 0 if the respondent did not receive the benefits of the gratuity educational policy; this could be because they paid the cost of tuition themselves or because they received a scholarship or loan outside the state gratuity policy, they attended a school that chose not to participate in the gratuity policy, or they did not pursue education during the period under study due to age or other circumstances. Moreover, since the gratuity policy took place in 2016, none of the respondents of wave 2015 received this benefit.

Given that years of education may increase at the individual level simply as respondents become older, we have incorporated a categorical variable, Age, into our models. This allows us to isolate the effect of age on the accumulation of education and mitigates the confounding effects of age-related increases in education. Effectively, we treat each one-year increment in age as a fixed-effect variable.

Finally, given the continuous nature of our dependent variable (Years of Education), we employed ordinary least-squares multivariate regression models to understand the effect of our independent variables of interest. To account for the complex survey design of the CASEN survey, we used the R package *survey*, employing the survey package function *svyglm* to perform the multivariate regression.

7. Results

Table 3 (below) presents results for the entire population sampled by the CASEN survey. Model 1 presents a simple model, including the dependent variable (years of education), and three baseline variables: women, poverty, and indigenous identity. This model displays, as expected, negative and significant effects for these three factors, all of which are factors that prior research has shown to be associated with lower years of educational attainment, both in Chile and in settings around the globe. In addition, this model and all subsequent models include variables indicating whether or not the respondent's mother and/or father has a higher education degree and age as a fixed effect. The positive, significant signs on the variables indicating parents' higher education are associated with a greater number of years of schooling; this is consistent with earlier findings that show how more highly educated parents promote the continuation of education among their children.

Table 3. Determinants of years of education.

	Model 1	**Model 2**	**Model 3**	**Model 4**
Intercept	8.981 (0.356) ***	8.956 (0.356) ***	8.959 (0.356) ***	8.976 (0.347) ***
Poverty	−2.387 (0.049) ***	−2.334 (0.058) ***	−2.344 (0.058) ***	−2.587 (0.096) ***
Women	−0.345 (0.028) ***	−0.358 (0.029) ***	−0.359 (0.029) ***	−0.392 (0.031) ***
Indigenous	−1.350 (0.056) ***	−1.297 (0.071) ***	−1.297 (0.071) ***	−1.295 (0.071) ***
Gratuity		2.679 (0.340) ***	2.172 (0.394) ***	1.943 (0.524) ***
Father Higher Ed	2.921 (0.063) ***	2.854 (0.075) ***	2.856 (0.075) ***	2.856 (0.075) ***
Mother Higher Ed	1.549 (0.067) ***	1.652 (0.075) ***	1.649 (0.075) ***	1.651 (0.075) ***
Gratuity × Poverty			2.100 (0.505) ***	1.516 (0.626) *
Gratuity × Women				0.447 (0.768)
Poverty × Women				0.372 (0.104) ***
Poverty × Women × Gratuity				0.506 (0.970)
Num.Obs.	143,381	99,904	99,904	99,904
R^2	0.307	0.311	0.311	0.311

Note: OLS regressions. Fixed effects for *Age*, although not reported, are included in all models. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Model 2 adds our key independent variable of interest: reception of the gratuity benefit. As can be seen, this variable displays a positive, significant relationship, indicating that the reception of the benefit is associated with an increase in the years of schooling reported by respondents who received it. These results align with the overall goal of the gratuity policy, and in this respect, we imagine that the polic's proponents would judge this a sign of success.

Do people living in poverty see gains in their education when they receive the gratuity? This was certainly the hope of the advocates of the policy. To assess this, Model 3 uses the same variables as Model 2 but includes the interaction between Poverty and Gratuity, highlighting the possible effect of the gratuity policy on people living in poverty. As can be seen, the coefficient is positive and significant, and the previous variables all retain their signs and significance, indicating that the reception of the benefit is associated with an increase in the years of schooling among low-income (i.e., in poverty) respondents. This may be the result of their decision to continue university education already begun, or to return to school from the labor market, upon receiving the gratuity benefit. It might also reflect family choices to continue a young adult's education rather than have them enter the labor force or work in the home.

Model 4 adds a series of further interaction terms to trace out some of the intersectional effects of the policy. The results show that our previous variables retain their sign and significance, as well as show a significant positive increase in education for women in poverty who do not receive gratuity. This result is somewhat surprising but may reflect scholarships or other support received by women in poverty who attend universities that do not offer the gratuity benefit; further research into this outcome is needed to understand it fully. Finally, in Model 4, the triple interaction does not display statistically significant

results, and indeed this may be because the key association of each variable is already modeled through the earlier terms. Our analyses below, which subset the sample by sex, aim to tease out these effects more clearly.

In Table 4 (below), we narrow our focus to look specifically at the effects of the gratuity policy on women. The analyses presented examine a subset of the population, women between 17 and 25 years of age. Given the recent introduction of the gratuity policy, this is the age group most likely to have benefitted from it, and it eliminates the many confounding factors that could have affected older or younger populations not of normal age for university studies. We recognize that the selection of this age group still overrepresents non-recipients of the gratuity policy, in that it includes many women who may have already opted out of education independent of the policy introduction due to age, but we believe it creates a more relevant comparison group to those who did receive the free education benefit in that everyone in this age group could theoretically have received the policy.

Table 4. Determinants of years of education among women, aged 17–25 years.

	Model 1	**Model 2**	**Model 3**
Intercept	10.192 (0.247) ***	10.178 (0.248) ***	10.188 (0.248) ***
Poverty	0.709 (0.145) ***	−0.689 (0.142) ***	−0.730 (0.146) ***
Indigenous	−0.566 (0.182) **	−0.641 (0.198) **	−0.637 (0.198) **
Gratuity		2.370 (0.299) ***	1.782 (0.353) ***
Father Higher Ed	1.369 (0.181) ***	1.434 (0.186) ***	1.444 (0.187) ***
Mother Higher Ed	1.203 (0.202) ***	1.319 (0.196) ***	1.300 (0.195) ***
Poverty × Gratuity			1.350 (0.612) *
Num.Obs.	5191	4745	4745
R^2	0.207	0.240	0.241

Note: Fixed effects for *Age*, although not reported, are included in all models. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

As can be seen, the results are consistent with our prior findings. In the absence of reception of the gratuity policy, women in poverty have lower educational attainment, as shown by the significant, negative coefficient, while gratuity is associated with higher educational attainment. The combination of these factors, which had been obscured in the triple interaction in Table 3, now shows up as positive and significant at the 5% level for women in poverty. In other words, Model 3 of Table 4 shows that poor women who receive free education seem to have an increase in their overall educational attainment as measured by years of schooling.

To summarize thus far, our results indicate that the gratuity policy is associated with higher educational attainment, and we have observed this in both the general population surveyed and, particularly, among women. Women who received the gratuity benefit have higher educational attainment than women who did not, and this is true for women in poverty as well. In spite of the policy's lack of design mechanisms to reach women, the results indicate that women's educational attainment has improved for those who received it.

Finally, we explore the impact of the gratuity policy on indigenous women in Table 5 (below). This intersectional group represents one of the most marginalized populations, and the interaction terms we introduce allow us to see how the triple status as indigenous, woman, and poor may benefit from the free education policy. Again, we focus on the population of potential beneficiaries of the gratuity policy, those aged between 17 and 25 years old, and we include age coefficients (not reported). As can be seen in Table 5, our results are consistent with our previous analyses though the associations become weaker. In Model 2, the positive coefficient for the reception of the benefit is only significant at the $p < 0.05$ level, and in Model 3, this coefficient loses significance as the effect seems to be concentrated on the population that is both in poverty and has received the benefit (the interaction term). Thus, as in the general population, indigenous women in poverty who receive the gratuity are associated with higher educational attainment than indigenous

women living in poverty who did not receive the benefit, but the effects seem to be weaker and more tenuous. This may represent some of the additional challenges faced by indigenous women in terms of social and familial norms, location, and previous preparation for higher education.

Table 5. Determinants of years of education among indigenous women, aged 17–25 years.

	Model 1	Model 2	Model 3
Intercept	10.122 (0.389) ***	10.115 (0.385) ***	10.117 (0.386) ***
Poverty	−1.330 (0.353) ***	−1.193 (0.400) **	−1.227 (0.401) **
Gratuity		2.013 (0.991) *	1.379 (1.025)
Father Higher Ed	1.753 (0.432) ***	1.511 (0.486) **	1.569 (0.486) **
Mother Higher Ed	1.081 (0.532) *	1.221 (0.539) *	1.145 (0.544) *
Poverty × Gratuity			3.324 (1.329) *
Num.Obs.	715	648	648
R^2	0.153	0.146	0.148

Note: OLS regressions. Fixed effects for *Age*, although not reported, are included in all models., * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

8. Discussion

Taken together, our results provide significant evidence that the gratuity policy is associated with greater educational attainment among those who receive it. In the absence of the policy, the CASEN survey data makes clear that people in poverty tend to have lower years of schooling than the rest of the population. Likewise, women, overall, display lower educational attainment than men. Moreover, indigenous women also attain lower years of schooling than non-indigenous women. For many of the reasons described above, these populations face particular challenges in continuing their education, and the gratuity policy has the potential to improve their ability to stay in school. That the reception of the free education benefit is consistently associated with increased years of schooling for these groups is a remarkable sign of early policy success.

One question that we have not yet analyzed concerns the selection into the benefit pool, both in terms of the size of the pool and the characteristics of the beneficiaries. Do some groups have greater access or make greater use of the policy? Although the policy was designed with reference only to the income level of the student's family, we might expect that patterns of inequality and bias would be replicated in the uptake of the policy, with women and indigenous people less likely to become beneficiaries. We examine this in two ways. First, using administrative data from the National Council of Education (CNED for its initials in Spanish), we explore first-year enrollment in Figure 1 over the years 2013 to 2022. This encompasses the years before the introduction of the gratuity policy to the years after its implementation.

As can be seen in Figure 1, overall enrollment (i.e., men and women enrollment) in the first year of higher education exhibited a slight increase. Looking at the enrollment by sex, we can see that this is driven by an increase in women's first-year enrollments, and this increase is significant and sustained through 2018; men actually see a drop-off in new enrollments over this period. Consistent with our earlier analysis, these enrollment trends indicate that the policy did indeed reach at least some women that might not have otherwise entered into university education, despite the many challenges that women face in continuing their education. Additionally, it also may indicate that universities may face infrastructure limitations that, in the short run, restricted the opening of spaces for new entrants, such that increasing access comes at the cost of spaces for others. Further, it may also reflect a larger trend of decreasing educational continuation among men, but further research on this is needed before conclusions can be drawn. Finally, the data show a large drop-off in new enrollments in 2020, reflecting the effects of the 2019 social protests and the COVID-19 pandemic.

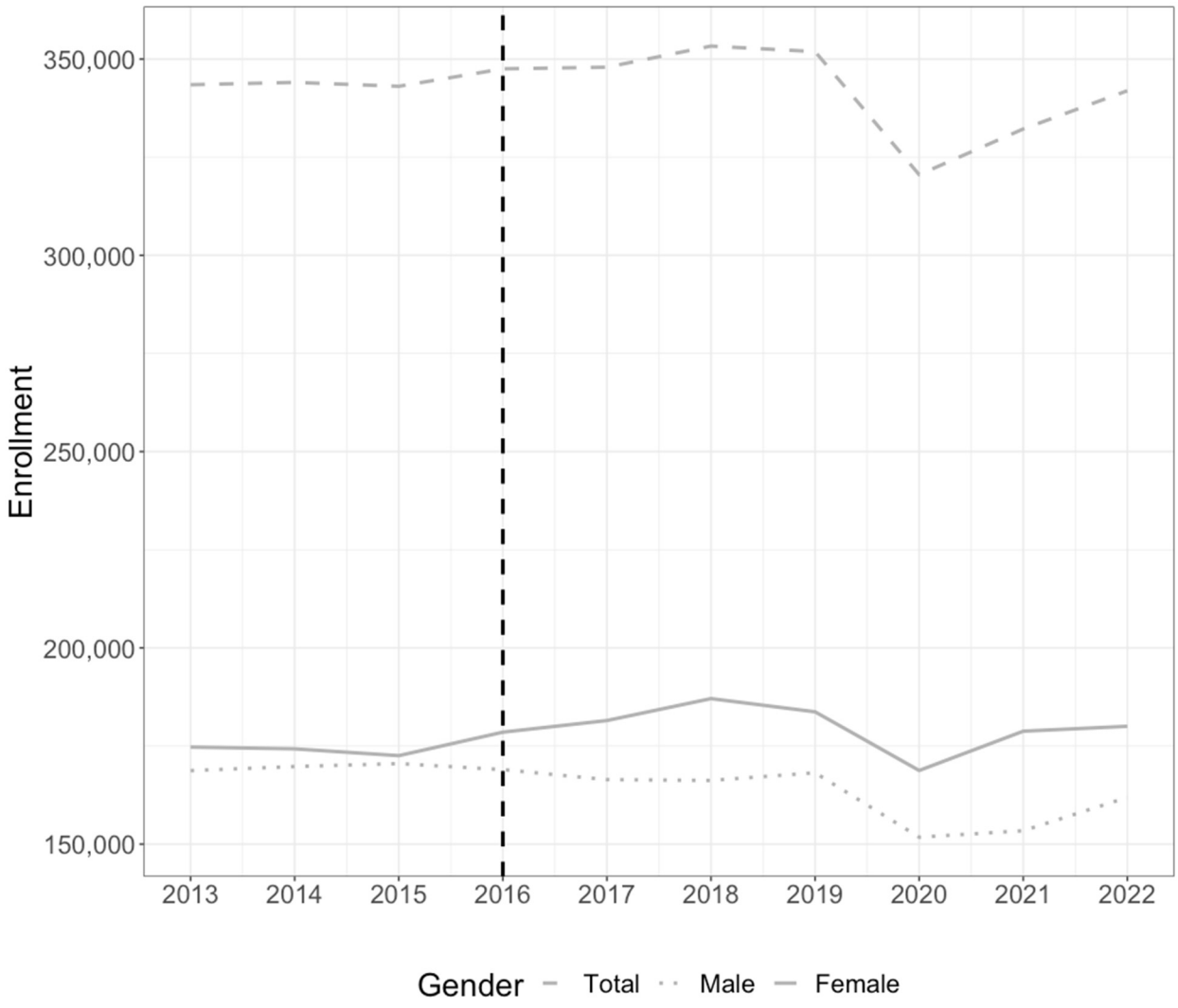

Figure 1. First-year enrollment trend by sex, 2013–2022.

Next, to investigate the determinants of reception of the gratuity—in other words, who receives it—we conducted a logistic regression with the reception of the gratuity as the dependent variable, and with poverty, gender, indigenous status, and educational attainment of the participants' fathers and mothers used as predictors. In Table 6, below, as expected given the policy design, poverty is a significant predictor of the reception of the benefit. In contrast, the variables for gender, indigenous, and the father's higher education are not significant predictors of receiving free education; only the mother's higher education has a significant, positive relationship. This seems to indicate a lack of gender bias in the beneficiaries of the policy (including both first-time entrants to higher education and continuing students).

Returning to our main results based on the CASEN data, the early individual-level evidence indicates that the Chilean free education policy is associated with a higher number of years of schooling for the recipient population as a whole, particularly for women, women in poverty, and indigenous women. This suggests that the policy is having its intended effect and that some of the effects are among the populations who need it most. While this is, of course, a preliminary result, given that our data can only reflect outcomes in the first years of the implementation of the policy, they are strong and consistent across model specifications and subpopulations.

Table 6. Determinants of receiving the gratuity benefit.

	Model 1
Poverty	1.217 (0.301) ***
Women	−0.067 (0.285)
Father Higher Ed	−0.569 (0.637)
Mother Higher Ed	1.575 (0.599) **
Indigenous	0.188 (0.383)
Num.Obs.	100,060
R^2	0.029

Note: Logistic regression. Odd ratio coefficients are shown in the table. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Anecdotal and qualitative evidence also offers support for the effectiveness and limits of the gratuity policy for women. Journalistic stories describe how the gratuity policy helped women who worked hard to enter higher education. For example, Alonso and Sánchez (2018) present the case of Marcela, who took the college entrance exam three times. She could have enrolled in private universities the first two times but decided not to enroll to avoid the high debts associated with it. Once the policy was introduced, however, she chose to enroll and complete her education. In addition, news reports in 2017 showed that many college students could have not enrolled without the gratuity policy because of the lack of family resources (CNN Chile 2017). Thus, the gratuity education policy provided many people, including women, the opportunity to enroll without fearing future indebtedness or decreasing resources to their families. Yet scholars such as Espinoza et al. (2022) suggest that the effect of the gratuity policy is more moderate, and may be overshadowed by factors such as parental education (which we have observed as significant in our analysis) and the selection process for university admission.

An open question for future research concerns the work opportunities and career paths that may or may not follow from these increased years of education. Indeed, a recent study by Sepúlveda and Lizama-Loyola (2022) demonstrates that unequal conditions can shape experiences in higher education, creating different life trajectories for marginalized groups. Thus, even though we have shown that the gratuity policy was effective in reaching marginalized women and indigenous women and increasing their years of education in the earliest years of the policy, further policy changes may be needed to mitigate the consequences of inequality across their subsequent economic lives. Moreover, as the introductory section of this article suggested, women face particular labor market barriers stemming from cultural norms of family caregiving, as well as gendered expectations that steer women into lower-paying jobs. Future scholars should explore the job choices, earnings, and careers of recipients of the gratuity, particularly women, and policymakers should pursue reforms that can support greater freedom and opportunity.

In addition, our research cannot comment on the educational paths, prior to university work, that may limit or enhance women's ability to benefit from the gratuity policy. The CASEN surveys did not track these characteristics, but we know that, traditionally, women have been more likely to assume roles in the home or outside employment prior to finishing secondary schooling, so this may limit their likelihood of pursuing tertiary education. However, Chile has also introduced gratuity into its secondary school network, and this may be fostering a new generation of young women prepared for higher education. Scholars and policymakers should track this process closely.

Finally, increased access to higher education, especially among traditionally underrepresented social groups, presents important challenges and opportunities for the universities they attend. Some universities were quick to enroll in the gratuity program, pledging to admit students regardless of need and facilitate their success, while others have been more cautious and even reluctant to do so. Given that higher education in Chile historically drew students from higher economic backgrounds, universities did not need to provide facilities—such as housing, meeting spaces, and supportive services for students with children or special needs—that a more diverse population requires. Enrolling these students thus

requires infrastructure changes and other costs that may discourage or shape the choice of private universities to participate in the free tuition program. In some cases, faculty and their academic specialization may also require change or adaptation. Future researchers should look at how the nature of higher education is being transformed in its structures, pedagogy, and disciplines, by the inclusion of students through the gratuity policy.

9. Conclusions

Education is often hailed as among the most significant levers for achieving economic growth, individual career advancement, and social change, and higher education enjoys an especially important role in this process. Yet, in many societies, significant barriers to entering or continuing tertiary education affect large segments of the population. Where private institutes or financing occupy an important portion of the educational market, and where tuition and living costs are high, many potential students may be prevented from gaining the education they would like to pursue. Social and familial norms can limit educational continuance even further for particular groups: women, who are often steered toward caregiving or lower-paying occupations, and indigenous people, who may have less opportunity for secondary education and suffer significant cultural biases against their advancement.

In this paper, we have observed the effect of the Chilean free education "gratuity" policy, introduced in 2016, in its early years of operation. We have sought to understand the extent to which the policy has had success in increasing the number of years students study, and our results suggest a promising beginning. While this cannot tell us about changes to lifetime occupational trajectories or income, it is an important indicator of changed behaviors in the population consistent with the goals of the policy.

Our analysis has given special focus, too, to the effects of the free education policy on educational attainment for women and indigenous people, recognizing the particular challenges these groups face. While proponents had hoped these groups would benefit from the reform, the weight of marginalization and systemic biases and inequalities leaves considerable doubt regarding whether inequalities would only be further perpetuated. Here again, the evidence is promising, with women and indigenous people seeing gains in their overall number of years of schooling. In other words, lowering the direct cost of education seems to encourage a continuation of education for women and indigenous people, as well as for the intersectional group of indigenous women.

Based on these findings, policymakers seeking to transform outcomes for women and indigenous groups would do well to start with reforms that lower the cost of education, especially by making it free or no cost. However, this should not be interpreted to mean that other policy measures are not also needed. In addition to the direct cost of matriculation, the cost of school supplies, living expenses, and foregone income from work can be significant barriers for many. Women, in particular, may face pressure from their family to provide care and stability in the home, and they may see men in the family prioritized in the pursuit of education. As a result, creative policymakers should consider enacting policies that target these challenges. For example, in addition to removing the cost of higher education, direct transfers to supplement or replace income should be considered, and offering higher benefits for women than men might help correct the male bias embedded in many societies. Likewise, given that indigenous people may live in areas with weaker secondary school systems and may need to travel to central cities where universities are located, policies should focus on improving local schools, developing universities in rural areas, and offering direct transfers to underwrite travel and living expenses for students that travel to the city. Finally, traditional universities, whose infrastructure has been designed predominantly for men, who are relatively privileged students, would do well to add facilities for students that may be living far from home or may be seeking appropriate affinity or cultural connections. Codes of conduct and norms may also need to be revised to better serve increasingly diverse populations.

The Chilean "gratuity" higher education reform thus offers important insights for addressing educational inequalities. Further research is needed to better explore its many impacts and implications, especially as additional years of experience and data become available. However, the possibility of using such reforms as a foundation for advancing opportunities for women and indigenous peoples opens important new vistas for policymakers in Latin America and beyond.

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