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Ibáñez Martín, María María; Formichella, María Marta; Ezequiel Costabel, Lucas
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Social exclusion: exploring the educational dimension in Argentina

Maria María Ibáñez Martín^a,
Maria Marta Formichella^a
and Lucas Ezequiel Costabel^b

^a Economic and Social Research Institute of the South (IIES, CONICET-UNS), Argentina and

^b National University of the South, Argentina.

Email addresses: maria.ibanez@uns.edu.ar; mformichella@iies-conicet.gob.ar and lucas.costabel@hotmail.com, respectively.

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Abstract

Social exclusion is a complex, multidimensional process which points to the persistence of a variety of deprivations in key dimensions of life, education among them. Working within this context, this paper studies determinants of exclusion in the educational dimension, specifically from its original degree (access), and seeks to evaluate whether they vary in relation to the socioeconomic conditions of the target population. To do this, logistic regression models were calculated using data from Argentina's Permanent Household Survey (PHS), in addition to information obtained from our own survey, performed in April of 2016 in three vulnerable communities of Bahía Blanca, Argentina.

Keywords: Argentina; social exclusion; education; logistic models; household surveys.

1. INTRODUCTION

Social exclusion is defined as a complex and multidimensional process that indicates the existence of deprivations in various relevant dimensions of life (Atkinson and Hills, 1998; Burchardt, 1998; Comisión de las Comunidades Europeas, 1992). It also implies the inability of excluded individuals to participate in activities and be part of networks that are usually accessible to members of the society in question (Ibáñez Martín *et al.*, 2017).

Among the areas included in the concept of exclusion, education stands out, given that education is essential to a person's development (Sen, 1999). However, distinct levels of this sort of exclusion are evident. The first level is inaccessibility of education, then segregation is considered, as well as the absence of the conditions necessary to participate successfully in the system, and abandonment and inequality in educational outcomes, among other issues (Formichella, 2010; Krüger, 2013).

In Argentina, the National Congress passed Law No. 26.206 in 2006, known as the "Education Law." Its 3rd article affirms that: "Education is a national priority and is established by State policy to build a just society, reaffirm national sovereignty and identity, deepen the exercise of democratic citizenship, respect human rights and fundamental freedoms, and strengthen the economic-social development of the Nation." It then states that:

- a) The structure of the National Educational System is comprised of four levels (Early Education, Primary Education, Secondary Education and Higher Education) (Law 26.206, art. 17);
- b) The compulsory nature of schooling begins at age five in early education and lasts until the completion of secondary level education (Law 26.206, art. 16);
- c) "The Nation State, the Provinces and the Autonomous City of Buenos Aires have the obligation to universalize educational services for children of four (4) years of age" (Law 26.206, art. 19); and
- d) Each jurisdiction will opt for two types of educational structure: six years of the primary level and six years of the secondary level, or seven and five, respectively (Law 26.206, art. 134).

Access to education in Argentina has shown significant improvements from the 1970s to the 2000s, the aforementioned circumstances being the most relevant during the final two decades of the period in question (Miranda *et al.*, 2007; Krüger, 2013). Although universal schooling was achieved at the primary level, the same is not seen at the secondary level—despite the fact that the degree of unequal access at this level is low (Serio, 2017), this problem persists, particularly in the last years of the educational track.

As of the establishment of Education Law 26.206 (2006), attendance at the intermediate educational level is mandatory; however, according to data from the last National Population, Household and Housing Census (INDEC, 2010), 34% of individuals of the age that should attend school at this level (young people between 12 and 18 years) do not. This represents, in absolute terms, more than one and a half million people who are outside the system. Therefore, individuals of secondary school age are taken as the population under analysis.

This article seeks to answer the following question: Is the behavior of the determining factors of educational exclusion in the vulnerable population similar to that observed in the general population (including all social strata)? To assess what these determinants are, as well as the homogeneity of their statistical significance, three populations are analyzed here: urban Argentina as a whole, the Bahía Blanca-Cerri agglomeration (in the province of Buenos Aires, Argentina), and three vulnerable neighborhoods of said agglomeration. In the first two cases, data obtained from the Permanent Household Survey (PHS) of Argentina's National Institute of Statistics and Censuses [Spanish acronym INDEC] (INDEC, 2016) are used, while in the remaining case, information is taken from a survey carried out within the framework of the Technological and Social Development Project (TSDP): "Design of strategies to improve educational opportunities for the vulnerable population of Bahía Blanca through the Volunteer Network NGO" (in which the authors participated). The time period was selected based on the fact that the survey work in the neighborhoods was carried out on a single occasion (April 2016), and the other two cases were adapted to the same quarter and year to be able to compare the results (thus avoiding short-term economic and institutional changes that could influence the study).

A logistic regression model is used as the methodology for the study of Argentina and the neighborhoods in question. Meanwhile, in the case of the Bahía Blanca-Cerri agglomeration a correlation analysis is used, due to technical issues explained in the corresponding section below. The article is structured as follows: in section 2 the theoretical framework is presented, in section 3 the methodology, variables and data are explained, in section 4 the results are presented, and in conclusion, the final considerations are presented.

2. THEORETICAL FRAMEWORK

Social exclusion: educational exclusion at its first level

Several scholars use the term exclusion to refer to situations of social inequality or poverty. However, poverty, inequality and social exclusion are distinct phenomena, with different causes and different consequences for society (Ibáñez Martín, 2018).

The exclusionary process is considered by some researchers as a dichotomous societal condition, with some individuals included and others excluded (Tezanos, 1999; Lipton *et al.*, 1998), while other scholars argue that there are intermediate situations which imply deprivations in various spheres and at different levels of intensity (Atkinson and Hills, 1998; Golovanevsky, 2003; Kristensen, 1995; BID, 2007).

Exclusion can be considered a multidimensional phenomenon. The spheres of social life involved are diverse and depend on what is "relevant" for an individual as they develop their life in a particular society and at a particular moment in time (Comisión de las Comunidades Europeas, 1992; Atkinson and Hills, 1998; Burchardt, 1998). However, there is disagreement regarding the importance of each sphere in shaping exclusive processes. Thus, some scholars believe that all dimensions play leading roles (Burchardt *et al.*, 1999), while others highlight a single dimension: either economic (Minujin, 1999; Castells, 2001); labor (Comisión de las Comunidades Europeas, 1992, 2000; Kessler, 2014); political (Silver, 1994; Berghman, 1995; Marshall, 1964); or that of citizen participation (Fabre, 2000; Atkinson and Hills, 1998).

The present work chooses to define the phenomenon of exclusion based on what Kessler (2011) refers to as a *pluralistic conception*. This implies multidimensionality and, in turn, the existence of exclusionary nuances. Estivill (2003) points out that the identification of such nuances is relevant because the measures for action that must be taken with any given group are different, and could potentially have adverse effects.

Following Ibáñez Martín (2018), education is considered to be one of the central dimensions in the explanation of social exclusion processes. Some scholars emphasize that education level is determinant of performance in the remaining dimensions (Rama, 1983; Vitello and Mithaug, 1998; Rivero, 1999; Látas, 2002; Brugué *et al.*, 2002; Blanco, 2006; Sarrionandia, 2006; Hopenhayn, 2008; De la Puente, 2009; Kessler, 2011; Sánchez, 2012; Ibáñez Martín, 2015), and the United Nations Educational, Scientific and Cultural Organization (UNESCO) defines educational inclusion as the process of identifying and responding to the diversity of all students' needs. Thus, educational inclusion involves making changes with a common vision that includes all individuals of the corresponding age range, and the conviction that it is the system's responsibility to educate everyone (UNESCO, 2006). According to Narodowski (2008), inclusion implies bringing together the efforts of different sectors of society to provide students with an education that is sensitive to each one's specific needs, compensating for inequalities and facilitating access, continuity and progress to those who most need it.

Thus, educational inclusion is not a dichotomous issue: while the first level of inclusion refers to access, and can be defined in such a way, the rest represent issues of quality, lags and achievements, among other aspects, which are defined according to degrees (Terigi *et al.*, 2010; Morresi *et al.*, 2017).

Educational exclusion at the first level: background in Argentina

Several investigations have studied the determinants of secondary school attendance in Argentina. Sosa and Marchionni (1999) analyze the issue using data from the PHS of 2006 for the Greater Buenos Aires, La Plata and Mendoza agglomerations in 1997. They highlight the fact that parents' income and education level (especially the mother), as well as family structure, significantly affect school attendance.

Meanwhile, Bertranou's research (2001)—which is based on the Social Development Survey—finds that the probability of attendance increases with income, parents' education level (more so that of the mother) and the female gender. This result is also presented by Miranda (2010), who analyzes the relationship between gender and high school attendance, based on data from the National Population and Housing Census 2001 and the PHS for 2006. Likewise, Bertranou (2001) stresses that the probability of school attendance is reduced with the number of siblings, the fact that the head of household

is female and the incorporation of young people into the labor market; Sosa and Marchionni (1999) and De Vos (2001), moreover, find that the probability of attending school is higher for those who live in homes with both parents and who are married.

Gasparini (2001) analyzes the injustice generated by the inequality of outcomes linked to unacceptable factors, such as gender and income. To do this, said work focuses on the case of middle school attendance in Greater Buenos Aires and other cities in Argentina, and uses data from the PHS of 2006.

Cerrutti and Binstok (2004) study school dropout rates for young people between 15 and 19 years of age, based on data from the 1997 Social Development Survey. They conclude that the main determinants are: educational climate in the home (negative effect), family structure (negative effect if both parents are present), number of siblings (positive effect), the presence of young children (positive effect) and existence of Unsatisfied Basic Needs (UBN) (positive effect).

Additionally, Groisman and Calero (2010) and Groisman (2011) analyze the determinants of schooling and labor participation in Argentina for young people between 15 and 18 years old. The authors find that the probability of school attendance at the secondary level is lower for boys; for those who do not reside with their parents; for those who are closer to adulthood; and for those who live in poor, single-parent households or in households with more members (more so if they are young children). These studies also highlight that the probability of staying in school is higher for young people living in homes with a formally employed household member. Paz and Cid (2012) also find that attendance is positively related to being female, as well as the educational climate of the home. Meanwhile, it is negatively related to age, with the fact that the head of household is unemployed or has an informal job, with the number of household members and with the average number of deprivations.

Recently, Formichella and Krüger (2019) and Alderete *et al.* (2017) have studied access to schooling and the educational conditions of adolescents living in vulnerable neighborhoods of the city of Bahía Blanca. The former scholars propose a study of clusters, and find that households with the presence of both parents or with a female head of household are favorable to adolescents' education. They also find that the type of activities that are carried out by the family are relevant: staying in school is most often linked to sports, reading or cultural activities, and is negatively associated with more frequent internet use, playing video games or watching television. The latter researchers find that being female, using the internet and having a better educational climate at home increase the chances of access to education, while living in a home with UBN or being older decreases them. The results found for populations in vulnerable neighborhoods do not differ from what is reported in other research which has analyzed the issue of school attendance in the urban population as a whole (both vulnerable and non-vulnerable).

The present research seeks to contrast with the conclusions of the latter works mentioned above—for example, that the variables which affect school attendance in contexts with multidimensional deprivations coincide with those affecting attendance in global contexts. However, two novel elements are incorporated here: on one hand, an identical model is proposed for the sample of the total national urban population and for that corresponding to the vulnerable neighborhoods being analyzed, making the conclusions more robust; on the other, the analysis is incorporated at the level of an urban agglomeration, specifically one in which the neighborhoods in question are inserted. This second element allows for a consideration of the determinants of school attendance in two populations that share general conditions related to their geographical area, while avoiding the biases that may exist when working with a population at the national level but not controlling for local characteristics.

3. METHODOLOGY, VARIABLES AND DATA

Calculation methodology: logistic regression model

The real situations or problems characterized by categorical variables, which breach the condition of continuity, can be analyzed and calculated using logistic regression models (Williams, 2006). The central problem addressed in this article meets this requirement, since the focus of analysis is the first level of educational exclusion (access).

The primary objective of logistic models is to calculate the probability of an event happening, based on certain explanatory variables (Liao, 1994). They make possible an understanding of the relationship between the variables and the event to be explained, if one exists (Velasco, 1996).

Logistic models assume that the probability ratio logarithm is linearly related to the regressor variables, which is the main difference between them and linear probability models¹ (Gujarati and Porter, 2009). The model can be expressed based on the following functional form:

$$\log it(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_{1,i} + \beta_2 X_{2,i} + \dots + \beta_k X_{k,i}$$

Where the parameters accompanying the explanatory variables are calculated using maximum likelihood and p_i is the probability that the event of interest will occur.

It is appropriate to apply logit models here as a way to calculate the effect of family and individual characteristics on exclusion from the educational system. Thus, the dependent variable denoted *Attendance* is dichotomous, and takes a value of 1 if the student attends an educational institution, and 0 otherwise.

The interpretation of logistic regression models is difficult because the estimators indicate the variation of the probability ratio in light of a change in the explanatory variables (Gujarati and Porter, 2009). As Pindyck and Rubinfeld (1998) point out, the effect of each individual variable depends on its initial

value and the value taken by the other explanatory variables incorporated into the model.

In line with the aim of this work, the regressors of highest interest here are those related to household socioeconomic level, such as: income level, occupational status and educational climate. However, since there may be other factors that affect the dependent variable simultaneously, it would not be correct, from a statistical point of view, to omit other variables that the prior evidence and theory show to be determinants. If such an omission were made, the effect of such variables could be included (erroneously) as part of outcomes which are associated with the study's central variables. As such, these variables are incorporated primarily as a way to control statistical biases (Wooldridge, 2010).

Logistic models are calculated for the PHS restricted sample² for all of Argentina's agglomerations, and for the sample corresponding to the three vulnerable neighborhoods in the city of Bahía Blanca that were analyzed using the aforementioned TSDP. In the case of the PHS subsample corresponding to the Bahía Blanca-Cerri agglomeration, it is not feasible to calculate logistic models, due to the limited number of observations obtained by restricting the sample by age group, and the low variability of that subset's variables.

As an alternative strategy, a tobit model is used, because the distribution of the dependent variable is highly concentrated on the left end of the distribution and its goodness-of-fit can be seen in such contexts and with small sample sizes (Jiménez Zambrano, 2005). However, the model does not converge due to a lack of observations. Subsequently—for descriptive purposes—a correlation test is applied between the dependent variable and the explanatory variables which are worked through using the logistic models calculated for the other two populations, in order to be able to compare the three populations under examination here.

Again, the number of observations delimits which tests may possibly be applied. In this case, the correlation is analyzed based on Kendall's tau-b coefficient, being an alternative option to Spearman's correlation. This coefficient behaves better than *Chi* 2 for small sample sizes.

Variables

For the proposed analyses, variables related to the individual characteristics of students and the households that they live in are used. These are described below. Table 1 presents the descriptive statistics.

Individual variables

- Gender: a dichotomous variable that takes a value of 1 if the student is male, and a value of 0 in the case of a female student.
- Age: a continuous variable that indicates the student's age.
- Active adolescent: a dichotomous variable that takes a value of 1 if the adolescent is occupied or unoccupied, and 0 otherwise.
- Health coverage: a variable that takes a value of 1 if the individual has health coverage of some kind, and 0 otherwise.
- Domestic work: a dichotomous variable that takes a value of 1 if the adolescent declares themselves primarily responsible for performing housework, and 0 otherwise. The former case was considered to be fulfilled when the individual reported devoting over two hours per day on such tasks.
- Adolescent spouse: a variable that takes a value of 1 if the adolescent is identified as having the role of spouse in the household, and 0 otherwise.

Family variables

- Single parent household: a dichotomous variable that takes a value of 1 if the head of household does not have a spouse, and 0 otherwise.
- Household educational climate: a continuous variable that represents the average number of years of education reached by those in the household over 18 years of age (SITEAL, 2015).
- Head of household's occupational status: a variable which reports the employment status of the head of household according to the following categories: formal worker; informal worker; unemployed worker; and inactive worker. The latter is the base category for calculations performed by logistic models. The INDEC defines any individual older than 10 years of age who did not work during the week of reference—but was available and actively sought work—as unemployed; those who did not work or look for work are defined to as inactive. Informal workers include unregistered paid workers and self-employed workers, and employers whose per capita family income pertains to the first five deciles of distribution (Formichella, 2011). In the sample corresponding to the TSDP, depending on the available information, the “unstable worker head of household” dichotomous variable is used, taking a value of 1 if the head of household has a job that is not secure in terms of temporal continuity, and 0 if they have a formal job, are unemployed or are inactive.
- Overcrowding: a dichotomous variable that takes a value of 1 if there are more than three people per room in the home (INDEC, 2014), and 0 in the opposite case.

Table 1. Descriptive statistics of explanatory variables for the probability of attending an educational institution. Second quarter of 2016

	<i>Argentinian urban population (PHS)</i>	<i>Blanca-Cerri bay (PHS)</i>	<i>TSDP neighborhoods</i>
	<i>n = 6997</i>	<i>n = 127</i>	<i>n = 201</i>
Family variables			
Single parent household	30.62%	32.28%	20.90%
Household educational climate	10.82	10.77	8.57
Overcrowding	7.79%	3.94%	19.90%
Employment status			
Formal	49.18%	48.82%	-
Informal	34.76%	51.18%	-
Unemployed	3.47%	4.72%	-
Inactive	19.12%	11.02%	-
Unstable	-	-	38.31%
Individual variables			
Gender	50.78%	51.97%	57.51%
Age	15.07	14.73	14.62
Adolescent spouse	10.13%	13.39%	2.00%
Active adolescent	5.66%	4.72%	9.09%
Domestic work	2.02%	3.94%	65.45%
Health coverage	63.81%	58.27%	34.50%

Source: prepared by the authors based on the PHS (INDEC, 2016) and TSDP project survey. Stata 13.1.

Data

The data utilized here come from two sources: in the case of Argentina and the Bahía Blanca-Cerri agglomeration, the PHS is used, and in the case of the vulnerable population, data are taken from the aforementioned survey.

The PHS is a national program in Argentina dedicated to systematically and continuously producing socio-economic and demographic indicators. It is carried out by the INDEC, currently covering 31 urban agglomerations and only one urban-rural one; thus, its representativeness is linked exclusively to the urban sector (INDEC, 2003). Although it would be interesting to be able to include the rural sector, there are no annual micro-databases available in Argentina to allow for such an analysis.

Highly rigorous statistical techniques are applied in the development of the household sample that is surveyed by the PHS, thus making it possible to obtain precise data. This sample, which is surveyed by the PHS, includes 25,000 households per quarter, meaning 100,000 households per year, since the sample is representative at the level of each agglomeration as well as at the national level (INDEC, 2003).

The project in which the PHS survey is framed aims to develop a strategic plan for the NGO "Volunteer Network for Better Childhood," which develops intervention work in order to promote children and adolescents' rights. Thus, the TSDP is oriented to make contributions which can improve interventions taken by the NGO in terms of education in three of the peripheral neighborhoods in which it works.

The survey consisted of conducting household surveys in the "Stella Maris," "Nueve de Noviembre" and "Cabré More" neighborhoods. Since these neighborhoods belong to the locality of Bahía Blanca, it was interesting to compare their situation with that of the city that houses them and with the country as whole. So that the comparison was not affected by biases related to the reference period considered or the section of the calendar year analyzed, data were taken from the second quarter of 2016 (which includes April 2016, which was when the TSDP survey was carried out).

The household survey conducted through the TSDP was undertaken using two forms: one referring to the household and housing, and another individual, which applied to all household members between 3 and 18 years old and focused on addressing issues related to their educations. The sample was formulated through a two-stage process, using a probabilistic sampling of neighborhood blocks and households; from this, 381 households were taken, encompassing a total of 1,459 people. Thus, the sample was representative of the entire population of the three peripheral neighborhoods.

4. RESULTS

The results obtained using the methodologies proposed above are presented below.

Results for Argentina

Based on the sample used, the PHS of the second quarter of 2016, it was found that 93% of the target population (individuals between 12 and 18 years old) participate in the formal education system. Table 2 shows the results from the econometric regression utilized.

Table 2. Determinants of the probability of school attendance at the secondary level. Argentina - Urban Population. Second quarter of 2016

<i>Explanatory variables</i>	<i>Coefficients</i>
Age	-0.4297* (0.0556)
Gender	-0.3250* (0.1587)
Educational climate	0.2034* (0.3980)
Single parent household	-0.4717* (0.2001)
Active adolescent	-1.4613* (0.1878)
Overcrowding	-0.8770* (0.1914)
Health coverage	0.5710* (0.2440)
Domestic work	-0.6864** (0.3518)
Informally employed head of household	0.1039 (0.2085)
Formally employed head of household	0.3842*** (0.2173)
Unemployed head of household	0.3857 (0.3572)
Adolescent spouse	0.3606 (0.2965)
Constant	7.3997* (0.8140)

Notes: *, **, ***: statistically significant variables to 1, 5 and 10% respectively. Standard deviations in parenthesis.

Source: prepared by the authors based on the PHS (INDEC, 2016), second trimester, 2016.

Certain variables which explain the probability of school attendance are statistically significant, while others are not. Among the former, the majority have a negative impact on the probability of attendance, coinciding with what is expected according to the theory discussed and prior evidence.

It can be observed that with higher age, the probability of school attendance is lower. This is to be expected due to the higher opportunity cost of school attendance—to the detriment of entering the labor market—for adolescents close to turning 18, in relation to younger adolescents. While the pressure for youth to contribute to the household economy may exist at different ages, as they grow up, their chances of generating income increase, and accordingly, the opportunity cost of spending time on studying is higher. Although in some cases the compatibility of the two activities (studying and working) may be observed, the effect of this variable demonstrates that in the majority of cases this will not be so. Rather, it causes a negative effect on the dependent variable, an outcome which corroborates clearly what is found by Paz and Cid (2012) and by Alderete *et al.* (2017).

Similarly, women are more likely to attend school than men. Men tend to be more easily inserted in the labor market and to earn better wages, which increases the opportunity cost of them studying. This is consistent with what is found by Paz and Cid (2012), who state that between 2003 and 2009, men attended school less than women due to their working status. Likewise, Bertranou (2001), Mirandada (2010), Groisman and Calero (2010), Groisman (2011) and Alderete *et al.* (2017) also find the same outcome in terms of gender and school attendance.

Regarding family structure, Sosa and Marchioni (1999), De Vos (2001) and Formichella *et al.* (2017) find that belonging to single parent households has a negative impact. This can also be due to the higher opportunity cost of attending school: on one hand, Cerrutti and Binstock (2004) argue that the absence of a potential income-earning adult can pressure an adolescent into having to generate income; on the other, it may be that the absence of said adult limits their financial potential to face expenses associated with a young person's education; or, both situations may be present. Another interpretation would be that the presence of an irruption in the family could affect the attention given to education, although a deeper treatment of this idea is outside the scope of the present work.

The young person's activity status also negatively affects attendance. As mentioned previously, work and education compete for individuals' time, becoming mutually exclusive options in the most extreme cases. Groisman (2012) asserts that insertion in the labor market is a determinant of school dropout and delays.

The same effect can be seen for those adolescents who are responsible for performing household tasks, such as home care. Those in charge of social reproduction (all those caregiving activities that guarantee human existence) are also more likely not to attend school. This is consistent given that social reproduction requires individuals to devote an equivalent or even greater amount of time than that required for work done outside the home. This coincides with that is found by Miranda (2010), who points out that in Argentina it is common for people who perform household tasks on a regular basis to have lower attendance in secondary education. This is also more common in the case of low-income families and for women.

Another negative determinant of school attendance is living in a home with overcrowding. Herrero (2005) explains that overcrowding reflects poor housing conditions, affecting health and reducing the chances that an individual can study; this is consistent with what is also found by Groisman and Calero (2010), Groisman (2011), Paz y Cid (2012) and Alderete *et al.* (2017).

Similarly, having health coverage and a head of household immersed in the formal labor market positively affect attendance. While the two variables are related, they do not strictly coincide. Insofar as employment status, a positive effect can be explained by the stability of a steady income which allows for planning the education of minors in the family, and limits the need for adolescents to become part of the PEA. Groisman and Calero (2010), Groisman (2011) and Paz and Cid (2012) come to this same conclusion.

With respect to the educational climate of the home, it is observed that the better a climate is, the higher the probability of school attendance. The importance given to investment in education has a positive relationship with the educational level of parents (Ibáñez Martín, 2015), and therefore it is likely that parents with more education make a more concerted effort for their children to attend school. It is also reasonable to think that higher educated adults have more and better tools to help with the educational process of minors. This positive effect coincides with what is found by Sosa and Marchionni (1999), Bertranou (2001), Cerrutti and Binstok (2004), Paz and Cid (2012) and Alderete *et al.* (2017).

In summary, at the national level, the probability of attending school for youth between 12 and 18 years of age is positively linked to the educational climate of the home, having health coverage and the head of household being inserted in the formal labor market. On the other hand, being older, being male, living in a single-parent or overcrowded household, or the adolescent being active in the labor market or responsible for housework, affect the aforementioned probability negatively. These results concur with previous research on this topic in Argentina.

Results for Blanca-Cerri Bay

As mentioned in the methodological section, due to the number of observations and the variability of the sample it was not possible to estimate logistic regression models for the Bahía Blanca-Cerri agglomeration, so a variable correlation analysis based on Kendall's tau-b coefficient was performed instead (see table 3). This allows us to draw a preliminary conclusion about the factors that could explain probabilities of school attendance.

Table 3. Correlation between school attendance and explanatory variables.
Bahía Blanca-Cerri agglomeration, urban population. Kendall's tau-b coefficient

<i>Attendance</i>	<i>Kendall's tau-b coefficient</i>
Age	-0.2143**
Gender	-0.0812***
Educational climate	0.1558**
Single parent household	-0.2031***
Active adolescent	-0.6617***
Overcrowding	-0.0559*
Health coverage	0.1396***
Domestic work	-0.2597
Informally employed head of household	-0.0856***
Formally employed head of household	-0.0372***
Unemployed head of household	-0.0615*
Adolescent spouse	0.0184**

Notes: *, **, ***: statistically significant variables to 1, 5 and 10% respectively.

Source: prepared by the authors based on the PHS (INDEC, 2016), second trimester, 2016, and based on calculations performed in STATA 13.1.

In this case, the percentage of adolescents attending secondary school is 92%. The results show that the variables' significance at the level of the agglomeration is mostly consistent with what was observed for Argentina. Being older, being a man, being active at work and belonging to a single parent household have a negative impact on the probability that adolescents in Bahía Blanca attend school. In turn, if the adolescent has health coverage, this possibility increases. However, unlike at the urban national level, it was found that being a spouse is a statistically significant variable which also increases the probability of school attendance.

Regarding the head of household's activity status: if the head of household is unemployed or informally or formally employed, the chances of school attendance decrease. It should be noted that in this case the base category is a *home with an inactive head of household* (otherwise the sign of the formal condition seems to be counter-intuitive). If the coefficients are analyzed using a *home with an informally employed head of household* as the base category, the same results are obtained as are seen for Argentina, where the head of household being formally employed increases the probability of school attendance. Likewise, the negative effect of belonging to a home with overcrowding is also verified and the same applies to the positive impact of the educational climate of the home.

The analysis of the situation in Bahía Blanca is limited by the small number of observations. Progress in the study of the determinants of secondary education access for this population could be made by utilizing the survey that is part of the Institute of Economic and Social Research of the South's Implementation Unit project: "Sustainable social inclusion: Innovations and public policies in a regional perspective"³ (work in progress).

Results for vulnerable communities of analysis

Lastly, a logistic model is calculated for the neighborhoods surveyed under the TSDP. In this case, the sample is composed of 201 observations in which 87% of individuals declare that they attend an educational institution (see table 4).

Table 4. Determinants of probability of school attendance at the secondary level. Bahía Blanca neighborhoods. April 2016

<i>Explanatory variables</i>	<i>Coefficients</i>
Age	-0.2534*** (0.1528)
Gender	-0.8774 (0.0745)
Educational climate	0.4554* (0.1567)
Single parent household	-0.0706 (0.8284)
Active adolescent	-5.2681* (0.9210)
Overcrowding	-1.3332 (0.8674)
Health coverage	1.0004 (0.6672)
Domestic work	-0.5658 (0.6568)
Head of household with unstable work	-0.4585 (0.7229)
Adolescent spouse	-2.7458* (1.063)
Constant	4.6719 (3.0453)

Notes: *, **, ***: statistically significant variables to 1, 5 and 10% respectively. Standard deviations in parenthesis.

Source: prepared by the authors based on the PHS (INDEC, 2016), second trimester, 2016, and based on calculations performed in STATA 13.1.

The age variable is statistically significant and shows the expected (negative) sign, being consistent with what was found at the national and agglomeration levels. The status of being economically active negatively affects school attendance. As mentioned previously, this may be due to the amount of responsibility that being immersed in the labor market or looking for work imply, both situations taking time away from the possibility of attending school. In this case, being a spouse is a statistically significant variable with a negative effect, which is a more intuitive finding than those previously relayed, given the time required to take care of household with cohabitation.

Additionally, households with a higher educational background increase the probability that their adolescent members attend school. In this case, the overcrowding variable has not proved to be statistically significant (although this may be due to its low variability in the sample).

Regarding the variables related to the head of household's employment status, only "head of household with unstable work" is incorporated because it was not possible to include the variables for formally employed, informally employed and unemployed head of household, given the number of observations and the variability of these variables in the sample.⁴ In this case, the condition of a head of household with unstable work seems not to be relevant in explaining the probability of adolescents attending school in the neighborhoods in question.

Based on the results presented here, it is clear that there is a certain homogeneity in the significance of the explanatory variables that have been incorporated. For Argentina and the Bahía Blanca-Cerri agglomeration, it is proven that the probability of an adolescent attending an educational institution is negatively affected by older age, the fact of being male, belonging to a home with overcrowding or a single parent household, having to perform household chores or being actively employed. On the other hand, the possibilities of attendance increase in the case of having health coverage, belonging to a home with a head of household inserted in the formal labor market or with a better educational climate. In the case of the

neighborhoods surveyed for the TSDP project, the significance and meaning of the age, educational climate and active adolescent variables are maintained.

5. FINAL CONSIDERATIONS

Throughout this work exclusion in its educational dimension was analyzed, with attention to its first stage, which involves restrictions on access to education. Individuals of the age to attend the level of secondary education (from 12 to 18 years old) in three different populations were considered, in order to determine whether common elements emerge in the determinants of the exclusionary process.

Two primary conclusions were reached: on the one hand, the variables that turned out to be relevant in relation to adolescents' possibility of attending school coincide with previous studies in the field, while on the other, certain variables maintain their statistical significance in the three case studies under consideration.

Based on the results, it is observed that non-attendance of school increases with age; adolescents manage to enter the educational system, but cannot sustain their attendance. Negative factors related to the need to assume adult responsibilities at an early age are detected, such as being head of household, being in charge of housework or being active in the labor force. Time is limited, and all of these contextual elements compete with the time that can be dedicated to study. Likewise, it appears in the findings that there are elements that "push" adolescents to face these types of responsibilities — among them, living in a home with some type of material deprivation, with a head of household who cannot ensure a continuous and secure source of income or a household with only one adult in charge. Additionally, it is observed that male individuals are more vulnerable to situations of this sort.

On the other hand, the role of parental education and the educational climate of the home is highlighted. The higher the educational level of adults in the home, there is a greater likelihood of adolescents attending school. The correlation between these variables could reflect the importance attached to the education of minors within a household, under the premise that adults with higher education tend to value education more, as well as having more and better tools to aid adolescents during educational processes.

Regarding the population living in vulnerable neighborhoods, the roles of age, of being economically active and of living in a household with a low educational climate are highlighted. These variables turned out to be significant from a statistical point of view, and coincide with those that resulted to be significant in the other two populations. Other of the elements mentioned above may not have stood out in this context due to a lack of variability.

In conclusion, this work contributes to the analysis of educational exclusion at its first level (access) and in various contexts. The door is open to advance the study of other forms of educational exclusion, such as the search for common elements that can emerge in different scenarios.

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¹ The linear probability model has numerous critics for models with dichotomous dependent variables, which go beyond the goals of this research. For more details, see Gujarati and Porter (2009).

² Given that the target population are those who attend school at the secondary level, the sample is restricted to the population of the age group from 12 to 18 years old.

³ Financed by the National Scientific and Technological Research Council, Argentina.

⁴ This implies that when incorporating all dichotomous variables in the calculations, the model does not converge and they are omitted by the program.