

Fear of Crime, Violence, and School Performance: an Analysis of the Probability of School Failure in Brazil

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Resumo

Este artigo tem como objetivo compreender detalhadamente o atraso escolar entre estudantes do ensino fundamental e médio no Brasil, adicionando variáveis relacionadas a insegurança e violência àquelas tradicionalmente usadas. Para tanto, utilizamos dados de uma Pesquisa Nacional por Amostra de Domicílios, em 2009, e aplicamos um modelo de *probit* econométrico para obter a probabilidade de atraso escolar. Confirmamos que a educação das mães é um determinante importante do insucesso escolar de um indivíduo. Além disso, fatores como ser homem, negro e ser criança em uma família desestruturada estão mais intimamente associados ao atraso escolar. Os resultados também indicam que ser vítima de crime, como roubo e agressão física, afeta significativa e positivamente as probabilidades de atraso escolar. A insegurança relacionada a violência, no entanto, foi positivamente significativa no nível do bairro apenas para aquela relatada por meninas entre 10 e 14 anos.

Palavras-chave: Insegurança, Violência, Atraso escolar.

JEL: C01, C25, I21

1 Introduction

One of the greatest concerns of the Brazilian educational system is students' inadequate educational progress owing to high levels of grade repetition and student dropout (BRUNS; EVANS; LUQUE, 2011; LEON; MENEZES-FILHO, 2001). Indeed, an evaluation of 65 countries by the Programme for International Students Assessment (PISA, 2015) found that, despite improvements in Brazilian students' grades and enrollment, the country still has problems with school failure (repetition and dropout rates). More than a third of 15-year-old students (36%) repeated at least once between elementary or middle school grades, one of the highest rates among PISA-participating countries. In addition,

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dropout rates are still a concern in Brazil, where the National Institute of Educational Studies and Research (INEP, 2018) highlights that more than 1.5 million individuals aged 5–17 years were prematurely out of school, that is, about 8% of the school population.

However, not only educational problems affect young people in Brazil. They are among the populations most affected by violence in Brazil (MALTA et al., 2010; DELANEY-BLACK et al., 2002). The phenomenon of violence against children and adolescents highlights the problems faced by students in the school environment (NESELLO et al., 2014), where violence has been aggravated due to increases in drug trafficking, gang formation, and possession of firearms (ABRAMOVAY; AVANCINI; OLIVEIRA, 2002).

We note that as a consequence of this violence in and around schools, students show poor school performance, resulting in an increased likelihood of grade repetition, since those who are unsafe may have difficulty concentrating on or even attending school properly (MONTEIRO; ROCHA, 2017). This fact was noted in the National Survey of School Health (PENSE, 2015). Analyzing more than 100,000 elementary-school students in Brazil, it found that nearly 15% of them had missed a day of school in the preceding 30 days because they felt unsafe in that environment. Thus, we note that students who fear crime in schools or who have been victimized are more likely to stay home for reasons other than illness (PEARSON; TOBY, 1991; LAB; WHITEHEAD, 1992).

Therefore, the objective of this study is to analyze the determinants of school failure in Brazil by adding variables related to school performance that are not adequately investigated in the literature, especially in the case of Brazil: violence and fear of crime. To do so, we will use the Brazilian National Domicile Sample Survey of Households (PNAD) in 2009 that provides, in addition to information on geographical, personal, and family characteristics, information about repetition and school dropout, to build our school failure group, and information about victimization and fear of crime to capture personal experiences in violent environments.

The main body of this article is divided into four sections. The first section presents a review of the literature on the effects of violence on school performance. Next, we discuss the econometric method and description of the data employed in the paper, following which the third section provides a descriptive analysis of school failure behavior and violence. Finally, the results and conclusion of the study are presented.

2 Theoretical and Empirical Foundation

According to Grogger (1997), an early analyst of the effects of violence and fear of crime on school performance, the main effects of violence on students are on their concentration in school, affecting student school performance and adversely affecting the acquisition of human capital. Examining violence in schools and neighborhoods in the United States in the years 1984 and 1986, Grogger studied how the local violence

affected high school graduation rates and college attendance and found that, on average, moderate levels of violence reduce the likelihood of high school graduation by 5.10% and the likelihood of attending college by 6.90%.

Bowen and Bowen (1999) state that fears of violence in the neighborhood and at school negatively affect student performance. The authors investigated the effects on the proficiency and attendance of students in the US of their perceptions of violence in schools and their environment in 1996 and 1997 and found that fear both at school and around it negatively affected student proficiency and school attendance in environments where the effect of violence was more perceived.

Mudege, Zulu, and Izubara (2008) state that children and their parents sometimes find it difficult to attend school because of physical insecurity there. Their study, conducted in disadvantaged urban neighborhoods in Nairobi, Kenya, in 2004, examined the effects of fear of crime on the performance of students and discussed how the perception of safety may affect the school attendance and enrollment of students. The results of their study suggest that fear of crime in these poorer neighborhoods may have negative impact on education.

Milam, Furr-Holden, and Leaf (2010) found that in addition to the factors that have already been shown in the empirical literature to affect the school failure of adolescents and youths, variables related to fear and violence are also relevant. The authors concluded that an increase in violence in the neighborhood was associated with a statistically significant decrease of 4.2% to 8.7% in math and reading scores, while increases in perceived safety were associated with significant increases of 16.7% to 22.8% in the scores of these subjects.

In the case of Brazil, Severnini (2007) used national data of 2003, Teixeira and Kassouf (2011) used 2007 data for the state of São Paulo, and Gama and Scorzafave (2013) used 2007 data for the city of São Paulo to investigate this issue and concluded that there are negative effects of violence on students' performance in these locations. According to Severnini (2007), the proficiency of students attending schools with higher levels of violence is lower even after controlling performance by individual characteristics, as well as teachers and schools. Besides this direct effect, it was also found that violence in these schools is related to high rates of turnover, which would also affect the quality of their education.

Teixeira and Kassouf (2011) concluded that violence in schools decreased by 0.5% the probability of a student in the third year of high school having satisfactory performance in mathematics. Gama and Scorzafave (2013), analyzing violence in the area surrounding the school, found that a 10% increase in the murder rate reduces school proficiency by around 0.1 points in both portuguese language and mathematics.

In Brazil there is clear evidence of the problems of school failure and violence. However, despite the importance of the problem, research on this topic has been limited. Therefore, following Grogger's (1997) finding that research on educational production

functions would do well to focus less on traditional measures such as school quality and class sizes and more on less traditional measures that received little attention in the past, including the fear of crime and violence witnessed by adolescents and youths, this paper addresses variables related to violence.

3 Method

The objective of this article is to verify whether the fear of crime and violence in addition to the traditionally established variables affect the educational development of students. For this purpose, we use the Brazilian National Domicile Sample Survey (PNAD) of 2009. This large national database analyzes self-reported victimization for the second time. Exclusively in 2009, PNAD included survey questions about security at three different levels: domicile, neighborhood, and municipality.¹

Our sample included only young people aged 10–18 years, as questions on security were asked only of individuals aged 10 years and above. Based on Machado (2007), the dependent variable, school failure, is considered a binary variable for individuals who: a) drop out of school (formerly attended school, but no longer attend and have not completed high school); or b) repeated (attend school but do not have the years of study corresponding to their age).²

To accomplish our objectives, we propose applying the probit econometric model. This model is used when the dependent variable y is binary. That is, $y = 1$ for individuals classified as experiencing school failure and 0 otherwise. Therefore, this study tried to find the probability of an individual facing school failure given their observable characteristics described in Table 1. Cameron and Trivedi (2009) and Greene (2012) define the probit model as:

$$Pr(y = 1 \vee x) = \Phi(x\beta) = \int_{-\infty}^{x\beta} \varphi(z)dz, \quad (1)$$

where Φ is the standard normal cumulative distribution function (cdf) expressed as an integral, x is a row vector of the explanatory variables (here defined as geographical, personal and family characteristics, fear of crime, and victimization), and β is the column vector of coefficients. The marginal effect, also utilized in this paper, is presented by Cameron and Trivedi (2005) as follows:

$$MargEffic = \partial p_i / \partial x_{ij} = \varphi(x\beta)\beta_j \quad (2)$$

¹The survey asked such yes/no-questions as: “Do you feel safe in your domicile?”, “Do you feel safe in your neighborhood?”, and “Do you feel safe in your municipality?”

²Someone who is 10 years old, for example, should have at least 4 years of schooling.

Table 1 – Expected trends of the independent variables used in the article

Variables	Code	Expected Trends	Literature
Geographic characteristics			
Brazilian regions	North region as reference group	Negative: Residents of northern Brazil are more likely to experience school failure	Machado (2007); Triaca and Tejada (2014)
Urban	1 = living in an urban area, 0 = otherwise	Negative: Residents of urban areas are less likely to experience school failure	Gomes-Neto and Hanushek (1994)
Personal characteristics			
Color	1 = black, 0 = otherwise	Positive: Blacks are more likely to experience school failure	Albernaz et al. (2002)
Sex	1 = male, 0 = female	Positive: Men are more likely to experience school failure	Machado and Gonzaga (2007); Aquino and Pazello (2011)
Work	1 = worked in the reference week and was under 16 years old, 0 = otherwise	Positive: young employment increases the likelihood of school failure	Machado (2007); Psacharopoulos (1997)
Pregnancy	1 = was pregnant and under 18 years old, 0 = otherwise	Positive: Having children at school ages increases the likelihood of school failure	Mudege, Zulu, and Izugbara (2008)
Family characteristics			
Mother's education	quantitative	Negative: Having a mother with high education decreases the likelihood of school failure	Honda (2007); Currie and Moretti (2002); Aquino and Pazello (2011)
Fatherless	1 = living in a single-mother family, 0 = otherwise	Positive: Living in a single-parent family increases the likelihood of school failure	Triaca and Tejada (2014)
Number of Siblings	quantitative	Positive: Bigger families increases the likelihood of school failure	Honda (2007)
Fear of Crime			
Domicile Neighborhood Municipality	1 = if the respondent claimed insecurity in that area, 0 = otherwise	Positive: Fear of crime increases the likelihood of school failure	Grogger (1997); Bowen and Bowen (1999); Mudege, Zulu, and Izugbara (2008)
Victimization			
Robbery /Theft Attempted Theft Robbery Aggression	1 = if the respondent claimed to be victim of that crime in the last year, 0 = otherwise	Positive: Having been the victim of a crime increases the likelihood of school failure	Milam, Furr-Holden and Leaf (2010); Grogger (1997); Abramovay et al. (2002)

Note: Information about the respondents' mothers are not given directly by the PNAD of 2009. Thus, to obtain information about education and number of children, the creation of a key with the following composition variables was necessary: V0102 (control number), V0103 (serial number), and V0301 (order number), given by PNAD.

Source: Own elaboration.

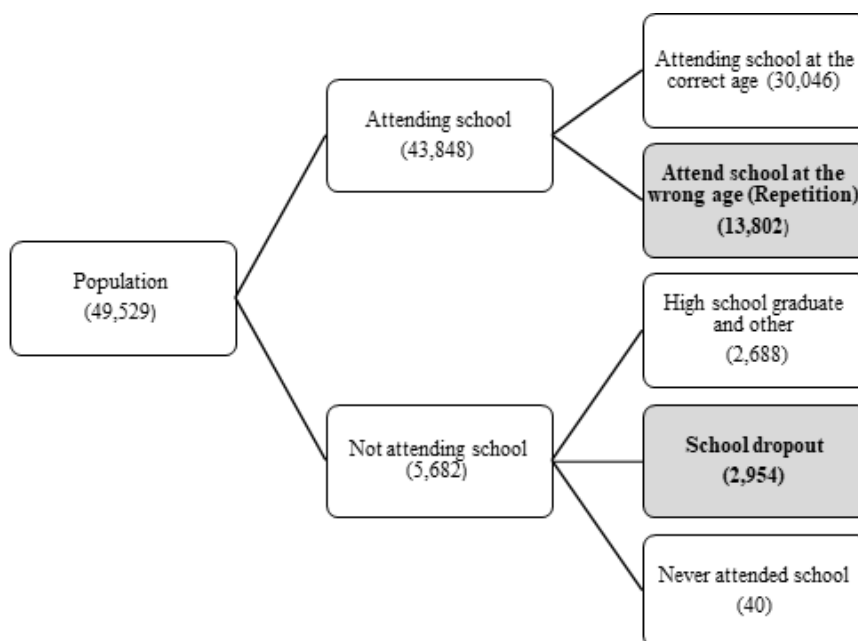


Figure 1 - Adolescents and young population (10–18 years old) and their educational status.
 Note: Those in gray are individuals in school failure.
 Source: PNAD (2009). Own Elaboration.

where $p_i = \Phi(x_i'\beta)$ The value of β_j gives the proportional effect on the probability that $y_i = 1$ as x_{ij} changes.

4 Descriptive Analysis

The objective of this section is to highlight the characteristics of the individuals analyzed in consideration of their educational status. First, Figure 1 shows how we constructed the school failure variable. The adolescent and young Brazilian population (49,529 individuals) can be divided into those who attend school (43,847 individuals) and those out of school (5,682 individuals). However, 2,688 individuals not attending school had completed their studies through the regular system or in some other way. Only 40 individuals in our sample answered that they had never attended school in their lives. Students that completed their studies and those individuals who had never attended school were not considered in our study, as our objective is to verify the effect of violence and insecurity on those of school age who are or should be attending school.

After removing “Never attended school” and “High school graduate and other”, our sample comprised 46,802 people, where the failure group is composed of the “School Dropout” and “Repetition” groups, that is, 16,756 individuals. These people are compared with the students in the group “Attending school at the correct age” that includes 30,046 individuals.

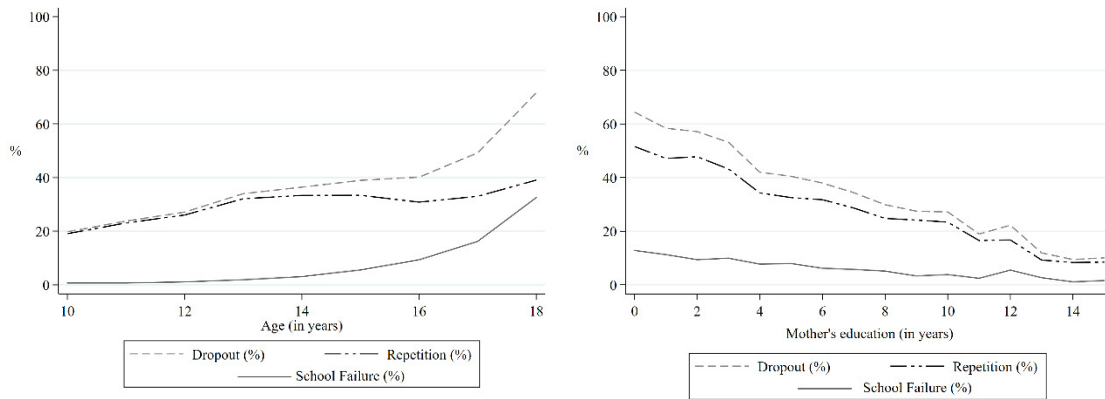


Figure 2 - School failure by category, age, and mother’s education, Brazil
 Source: PNAD (2009). Own Elaboration.

In Figure 2 we present by age and mother’s education these three groups, dropout, repetition, and school failure, in our sample. Initially, for 10-year-olds, school failure basically refers to those who repeated a grade. In this age bracket, 19.76% of our sample showed school failure status. Dropout begins to be a relevant problem when we consider 13-year-olds, for whom school failure affects 1 out of 3 people.

It is also in this age range that repetition rate, primarily responsible for school failure in the lower age groups, stabilizes even in the face of an increasing school failure rate. This behavior is discussed by Cairns, Cairns, and Neckerman (1989), Grissom and Shepard (1989), and Leon and Menezes-Filho (2001), who state that students in “repetition” are more likely to drop out of school, thereby changing their status.

In the last analyzed age range, people of 18 years of age, 71.63% were considered in school failure, wherein 39.00%, although in school, were at levels not compatible with their ages and 32.57% were out of school without graduating from high school. Mothers’ education gives us a notion of economic vulnerability. Thus, after considering this variable, where 1 means one year of education, 2 two years of education, and so on, we observe that the adolescents and young people most affected by school failure belong to families with low mother’s education. If we consider the lowest group, mothers with zero years of education (illiterate mothers), about 65% of this population show school failure, where about 12.82% of them were out of school.

The converse is observed in students with higher mother’s education, of whom only 10% were in school failure and practically all of whom were still attending school. In short, the results suggest that in Brazil almost the entire school-age population has access to school. However, a considerable part of this population, mainly sons of less-educated mothers, do not progress continuously in the school system, either on account of school retention problems at lower ages or school dropout at higher ages. These results cor-

roborate the findings of Gomes-Neto and Hanushek (1994) and Leon and Menezes-Filho (2001).

5 Results and Discussion

Probit regression analysis enables us to understand the explanatory factors that influence the probability of whether a person is in school failure and whether this influence is positive or negative. In Table 2 this technique is applied by dividing the analysis along two different specifications: i) first, we consider the variables commonly used in the literature, namely geographical characteristics, personal characteristics, and family characteristics; ii) second, we also consider variables related to fear of crime and victimization.

However, before conducting these analyses, as pointed out by Honda (2007), we must address the problem of endogeneity due to mother's education, as it involves the unobserved variable of the mother's ability, which influences her education process and level of school failure. Thus, household infrastructure, also strongly associated with wealth, was used as a measure of mother's education. Five variables (possession of movable property, residence condition, locomotion, sewer/trash/water, and raw material of the house) have been considered and are detailed in the note of Table A1 in the appendix section.

That said, in the analysis of geographical characteristics, we note that residents in the Northern region (reference region) are more likely to face failure than other Brazilian regions. The marginal effects indicate that residents in other Brazilian regions have on average about a 5% lower chance of failure than in the North, where children have fewer opportunities for education (MACHADO; GONZAGA, 2007). The results for the urban variable show us that individuals living in this region are more prone to school failure than their counterparts. Although the educational offerings may be better in urban areas, there may be other factors, such as those associated with the attractiveness of the labor market, encouraging leaving school instead of being dedicated to studies.

The second group of variables analyzed, personal characteristics, included attributes such as race/ethnicity, sex, and school-age work. First, we note that male students and those self-declared as black are generally more likely to face school failure than their counterparts, 6.6% and 13.6%, respectively. School-age work is another statistically significant factor affecting the likelihood of school failure, where individuals in this group present a 10.1% higher chance of being in school failure in Brazil.

Family characteristics, the third group of variables analyzed, addresses variables related to mother's education, single-parent families (fatherless), and number of siblings. Regarding mother's education, we note that each year of maternal education reduces the likelihood of failure by about 2.5%. Following Currie and Moretti (2003), one channel whereby mother's education can affect child quality is by differences in household budget constraints, as highly educated mothers are better able to facilitate school attendance and

the performance of their children in school.

Single parents and number of siblings were also significant variables affecting the chances of school failure. Children in single-parent families, living only with their mothers, have a 7.2% higher chance of experiencing failure. Furthermore, the addition of each child in a family increases the likelihood of academic failure by 3.3%. Haveman and Wolfe (1995) emphasize that growing up in a single-parent family has negative effects on students' educational performance. However, Krein and Beller (1988) point out that due to the reduction of family resources for children that occurs in single-parent families and large families, their school performance is more likely to be impaired.

Although it was expected that the fear of crime in the three levels would positively affect the likelihood of school failure, for our general sample none of the variables showed statistically significant effects on the probability of school failure in Brazil. Different results, however, were observed for the victimization variables, where direct crimes and those considered more serious positively affected the probability of school failure. Physical assault was the crime that had the highest marginal effect on school failure: Students in this group are 7.1% more likely to be in school failure. This result was expected since this crime is one that involves physical contact and has relatively greater severity (SKOGAN; MAXFIELD, 1981).

To further investigate the differences observed in school failure by sex and age groups, in Table 3 we analyze three different specifications for boys and girls: i) individuals in the 10–18-year group (general sample); ii) those in the 10–14-year group; and iii) those in the 15–18-year group. For the first group of variables, geographical characteristics, Northern and urban residents still have higher probabilities of school failure in Brazil regardless of age or sex. North Brazil has serious structural problems compared to other regions that seem to affect all ages and genders.

Personal characteristics, however, present different results for sex and age. Skin color attribute, in our case people self-declaring as black, has no impact on school failure for girls in the 15–18 age group. Nonetheless, among boys and younger girls it is still clear that being black increases the likelihood of school failure. Different results were observed for the variable “school-age work” for men and women. In the case of men, reporting school-age work increases the chances of school failure, which does not hold in our data for women. The reason is the different characteristics of jobs for women and men at younger ages. Teenage and young women, for example, can devote themselves more intensely to domestic jobs, such as taking care of younger siblings (MACHADO; GONZAGA, 2007).

Table 2 – IV probit estimates of the effects of variables on school failure, Brazil

Independent variables	(1)			(2)		
	Coef.	Robust SE	Marg Eff.	Coef.	Robust SE	Marg Eff.
Constant	0.505***	(0.031)	-	0.510***	(0.032)	-
Geographical characteristics						
Northeast	-0.128***	(0.019)	-0.007	-0.129***	(0.019)	-0.007
South	-0.233***	(0.020)	-0.031	-0.230***	(0.020)	-0.030
Southeast	-0.347***	(0.023)	-0.067	-0.345***	(0.023)	-0.066
Midwest	-0.223***	(0.025)	-0.048	-0.221***	(0.025)	-0.048
Urban	0.124***	(0.018)	0.014	0.121***	(0.018)	0.013
Personal characteristics						
Black	0.156***	(0.025)	0.066	0.153***	(0.025)	0.065
Man	0.358***	(0.013)	0.136	0.355***	(0.013)	0.135
Work	0.175***	(0.018)	0.102	0.171***	(0.018)	0.101
Family characteristics						
Mother's education [^]	-0.170***	(0.003)	-0.025	-0.171***	(0.003)	-0.025
Fatherless	0.214***	(0.016)	0.073	0.212***	(0.016)	0.072
Number of Siblings	0.038***	(0.005)	0.033	0.038***	(0.005)	0.033
Fear of Crime						
Domicile	-	-	-	-0.015	(0.021)	0.004
Neighborhood	-	-	-	0.004	(0.021)	0.004
Municipality	-	-	-	0.003	(0.017)	-0.009
Victimization						
Attempted Robbery/Theft	-	-	-	-0.013	(0.042)	-0.009
Theft	-	-	-	0.026	(0.046)	-0.007
Robbery	-	-	-	0.116***	(0.040)	0.037
Physical assault	-	-	-	0.169***	(0.045)	0.071
Estimated population		46,802			46,802	
Wald X^2		9,965.9			10,038.96	
Prob $>X^2$		0.000			0.000	
Correctly classified		69.32%			69.30%	

Notes: Robust standard errors are in parentheses where p-value < 0.10: (*), p < 0.05: (**), and p < 0.01: (***). Five instruments were used for the variable of mother's education: Possession of movable property, residence condition, locomotion, sewer/trash/water, and raw material of the house.

Source: PNAD (2009). Own Elaboration.

Table 3 – IV probit estimates of the effects of variables on school failure by sex and age, Brazil

Independent variables	10-18 years				10-14 years				15-18 years			
	Men		Woman		Men		Woman		Men		Woman	
	Coef.	Robust SE	Coef.	Robust SE	Coef.	Robust SE	Coef.	Robust SE	Coef.	Robust SE	Coef.	Robust SE
Constant	0.865***	(0.041)	0.472***	(0.047)	0.754***	(0.056)	0.429***	(0.063)	1.332***	(0.060)	0.766***	(0.067)
Geographic characteristics												
Northeast	-0.095***	(0.027)	-0.154***	(0.029)	-0.086**	(0.034)	-0.206***	(0.036)	-0.138***	(0.042)	-0.126***	(0.046)
South	-0.230***	(0.028)	-0.212***	(0.030)	-0.203***	(0.037)	-0.199***	(0.039)	-0.275***	(0.044)	-0.256***	(0.048)
Southeast	-0.338***	(0.032)	-0.334***	(0.035)	-0.439***	(0.043)	-0.471***	(0.047)	-0.250***	(0.049)	-0.212***	(0.053)
Midwest	-0.215***	(0.034)	-0.224***	(0.038)	-0.208***	(0.045)	-0.266***	(0.050)	-0.213***	(0.053)	-0.195***	(0.059)
Urban	0.104***	(0.024)	0.151***	(0.027)	0.056*	(0.032)	0.168***	(0.034)	0.145***	(0.039)	0.160***	(0.042)
Personal characteristics												
Black	0.154***	(0.035)	0.162***	(0.038)	0.130***	(0.046)	0.216***	(0.049)	0.164***	(0.054)	0.076	(0.058)
Work	0.254***	(0.023)	-0.018	(0.030)	0.036	(0.038)	-0.106*	(0.054)	0.041	(0.030)	-0.178***	(0.037)
Pregnancy	-	-	1.143***	(0.083)	-	-	0.955**	(0.386)	-	-	0.883***	(0.087)
Family characteristics												
Mother's education [^]	-0.172***	(0.004)	-0.169***	(0.004)	-0.176***	(0.005)	-0.178***	(0.006)	-0.192***	(0.005)	-0.177***	(0.006)
Fatherless	0.209***	(0.022)	0.162***	(0.023)	0.172***	(0.029)	0.119***	(0.031)	0.196***	(0.033)	0.168***	(0.034)
Family size	0.035***	(0.007)	0.045***	(0.007)	0.040***	(0.009)	0.036***	(0.010)	0.028**	(0.011)	0.052***	(0.011)
Fear of crime												
Domicile	0.005	(0.029)	-0.039	(0.030)	0.001	(0.038)	-0.110***	(0.040)	0.007	(0.044)	0.048	(0.046)
Neighborhood	0.004	(0.029)	0.011	(0.031)	0.028	(0.039)	0.080**	(0.041)	-0.025	(0.043)	-0.076	(0.047)
Municipality	-0.007	(0.023)	0.010	(0.025)	-0.006	(0.031)	-0.001	(0.034)	0.006	(0.036)	0.017	(0.038)
Victimization												
Robbery/Theft Attempted	0.017	(0.054)	-0.045	(0.065)	-0.041	(0.088)	0.024	(0.114)	0.010	(0.068)	-0.115	(0.078)
Theft	0.021	(0.060)	0.020	(0.075)	0.013	(0.093)	-0.036	(0.121)	-0.028	(0.078)	-0.004	(0.097)
Robbery	0.112**	(0.052)	0.135**	(0.065)	0.052	(0.090)	0.086	(0.131)	-0.009	(0.063)	0.023	(0.075)
Physical assault	0.114**	(0.056)	0.260***	(0.074)	0.032	(0.076)	0.154	(0.108)	0.218***	(0.083)	0.319***	(0.106)
Sample	24,411		22,391		14,523		13,731		9,888		8,66	
Wald X^2	5,645.8		3,914.95		3,156.27		2,163.87		2,998.02		2,145.01	
Prob $>X^2$	0.000		0.000		0.000		0.000		0.000		0.000	

Notes: Robust standard errors in parentheses where p-value < 0.10: (*), p < 0.05: (**), and p < 0.010: (***). Five instruments were used for the variable mother's education: Possession of movable property, residence condition, locomotion, sewer/trash/water, and raw material of the house. For the women's regression we added the variable of pregnancy.

Source: PNAD (2009). Own Elaboration.

An important issue discussed in the literature is early pregnancy and its impact on girls' school performance (MUDEGE; ZULU; IZUBARA, 2008). For that reason, we considered this variable in the specifications of the women's regression. We found significantly high coefficients for girls who were pregnant, especially for younger girls, indicating that pregnant adolescents have a high probability of facing school failure. Rumberger (1983) points out pregnancy as one important reason explaining why women leave school.

Variables related to family characteristics, such as mother's education, families without father's presence, and number of siblings, present the same pattern for all age groups analyzed, as well as for men and women: Living in families with lower mother's education, single parents, and large numbers of siblings increases the chances of school failure.

Fear of crime variables now showed significance, but only for girls in the 10–14 age group. We found that girls who answered that they were insecure at the domicile level were less likely to experience school failure. An inverse result was observed for neighborhood insecurity, in which girls in this same age group who were concerned for their safety at the neighborhood level showed a greater probability of failure. A possible explanation for this result can be found in Grogger (1997), where the author points out that neighborhood fear can indicate fear in schools, which thereby inhibits adolescents or the young (especially those who are or feel more vulnerable to insecurity) from going to school or even having good academic performance. Likewise, girls unsafe at the domicile level may see another environment (school, for example) as a "refuge" from the insecurity felt in their own home, thus reducing their chances of missing classes, repeating a grade, and eventually dropping out of school.

Regarding victimization, a difference between sexes was not observed. Both men and women who claim to have been victims of crimes such as robbery or physical assault in the 12 months prior to the survey had a higher chance of school failure. Thus, our last analysis, presented in Table 4, sought to verify possible differences between the impacts on repetition and school dropout (the components of our main dependent variable, school failure). This analysis seems important because, as seen in Figure 2, repetition and school dropout have different patterns for different age groups.

First, we noticed that the problem of repetition among residents of the North remained, where other regions have a lower chance of this event occurring. In school dropout, however, residents of other regions, such as Southeast and Midwest, show higher chances of school dropout. Another point addressed in the personal characteristics indicates that a significant difference between different races/ethnicities lies in the issue of repetition, whereby people self-declared as blacks have a higher chance of repetition. Men, however, have greater chances of both repetition and school dropout in Brazil. Another important fact observed when we analyzed repetition and school dropout separately is that school-age work increases the chances of school dropout but not repetition.

Family characteristics in general maintained the same trends for both repetition and school dropout variables, whereby mother's education reduced the chances of repetition

by 1.8% and school dropout by 0.5% for each year of study. Single-parent sons, where the father is absent, have a higher probability of school dropout, 3.2%, than of repetition, 2.8%. This result was expected because without the father's presence, the young may feel compelled to leave school to work and contribute to their families' income.

We observe that the variables related to fear of crime and victimization are more related to school dropout. Insecurity reported at the domicile level and direct violence, such as robbery and physical assault, increase the likelihood of school dropout. Nevertheless, students who report insecurity at the home level are less likely to repeat a grade. Again, these students may find in the school environment a way to avoid insecurity observed at home, thus prioritizing activities in the school environment and reducing their chances of repetition.

In view of the constant reports of insecurity and victimization in Brazil, this study, focusing on school-age individuals, examined whether these reports accurately reflect the probability of school failure (school dropout and repetition of a grade). As pointed out by Grogger (1997), the violence experienced by young people seems to affect variables related to education. Our results showed that these variables, those for physical assault in particular (SKOGAN; MAXFIELD, 1981), are associated with school failure and especially with school dropout.

These results show that it is possible to provide information for public policies focused on violence in school environments and their surroundings. Young people spend most of their time in these places, where insecurity and/or victimization can lead students to avoid them (GROGGER, 1997), possibly leading to repetition and school dropout.

6 Conclusions

The objective of this study was to analyze the variables impacting the probability of school failure in Brazil among people in the 10–18 years group, adding variables related to fear of crime and violence to the traditional analysis. More specifically, we considered fear of crime at the domicile, neighborhood, and municipality levels and attempted robbery/theft, theft, robbery, and physical assault as victimization variables. For this analysis we used data from a Brazilian National Domicile Sample Survey in 2009 and the probit model. We also analyzed the different impacts of these factors on repetition and school dropout (the variables composing school failure).

The results indicate that residents in the North and urban residents in general show higher chances of school failure. We also identified that certain personal characteristics, such as race/ethnicity (black people), sex (males), and work status (working or had already worked), impaired the likelihood of adequate progress in educational systems. The effect of school-age work, however, was positively significant only for men. For women, the variable of pregnancy during school age was a strong predictor of school failure.

Table 4 – IV probit estimates of the effect on Repetition and Dropout, Brazil

Independent variables	Repetition			Dropout		
	Coef.	Robust SE	Marg Eff.	Coef.	Robust SE	Marg Eff.
Constant	0.360***	(0.033)	-	-1.321***	(0.058)	-
Geographical characteristics						
Northeast	-0.114***	(0.019)	-0.004	-0.095***	(0.031)	-0.003
South	-0.249***	(0.021)	-0.038	0.003	(0.033)	0.010
Southeast	-0.417***	(0.024)	-0.086	0.114***	(0.036)	0.024
Midwest	-0.261***	(0.026)	-0.058	0.075*	(0.039)	0.014
Urban	0.061***	(0.018)	-0.007	0.242***	(0.028)	0.016
Personal characteristics						
Black	0.166***	(0.026)	0.064	-0.007	(0.039)	0.000
Man	0.298***	(0.013)	0.102	0.223***	(0.020)	0.021
Work	-0.163***	(0.018)	-0.032	0.640***	(0.023)	0.100
Family characteristics						
Mother's education [^]	-0.150***	(0.003)	-0.018	-0.116***	(0.006)	-0.005
Fatherless	0.108***	(0.016)	0.028	0.303***	(0.023)	0.032
Number of Siblings	0.034***	(0.005)	0.027	-0.010	(0.007)	0.002
Fear of Crime						
Domicile	-0.042**	(0.021)	-0.007	0.081**	(0.033)	0.010
Neighborhood	-0.001	(0.021)	0.002	0.005	(0.034)	0.001
Municipality	0.02	(0.017)	-0.001	-0.038	(0.028)	-0.005
Victimization						
Attempted Robbery/Theft	-0.038	(0.043)	-0.017	0.064	(0.063)	0.006
Theft	0.021	(0.048)	-0.006	0.042	(0.070)	0.002
Robbery	0.056	(0.042)	0.012	0.209***	(0.060)	0.022
Physical assault	0.041	(0.047)	0.017	0.299***	(0.059)	0.037
Estimated population		46,802			46,802	
Wald X^2		6,953.83			2,501.96	
Prob > X^2		0.000			0.000	
Correctly classified		72.18%			93.75%	

Notes: Robust standard errors in parentheses where p-value < 0.10: (*), p < 0.05: (**), and p < 0.01: (***). Five instruments were used for the variable mother's education: Possession of movable property, residence condition, locomotion, sewer/trash/water, and raw material of the house.

Source: PNAD (2009). Own Elaboration.

Family structure variables were robust in all the analyzed specifications, such that children having mothers with low education, living in single-parent families, and living in a larger family are more likely to be associated with school failure in Brazil. These children may be less likely to find the support and encouragement needed to remain in school.

Estimates of their fear of crime allowed us to infer that the fear in the neighborhood positively affects the probability of school failure only for younger girls. Fear at this level can stand in for fear in the school environment since individuals generally study in schools located in their neighborhoods, with the latter affecting the performance of adolescents and youths in the school environment.

It was found that the probability of failure in school is influenced by violence, mostly by robbery and physical assault. This result corroborates the literature that says that, because it involves physical contact and a certain severity, violent crime has major consequences on the individual. Other types of crimes covered by this article, such as attempted robbery/theft and theft, did not show significant effects on the likelihood of failure in school.

Lastly, we analyzed repetition and dropout separately and concluded that variables related to family characteristics affect both. However, other characteristics have different impacts on the likelihood of repetition and school dropout. For example, the impact of victimization is only observed for dropout.

Our results contribute to the literature on school backwardness in Brazil by adding variables related to fear of crime and victimization. Despite some limitations observed in our data, in which the information on violence refers only to the 12 months prior to the survey, such that it is not possible, for example, to accurately determine whether insecurity or victimization happened before school failure, the results give us clues about the association between victimization and school failure. Public policies aimed at reducing violence in the school setting and environment would contribute to reducing these adverse influences, causing decreases in absences, repetition, and finally school dropout.

Fear of Crime, Violence, and School Performance: an Analysis of the Probability of School Failure in Brazil

Abstract

This paper aims to understand in detail school failure among elementary and high school students in Brazil by adding variables related to the fear of crime and violence to those traditionally used. To this end, we use data from a Brazilian National Domicile Sample Survey, in 2009, and apply an econometric probit model to obtain the probability of school failure. We confirm that mothers' education is an important determinant of an individual's school failure. Furthermore, factors such as being male, black, and a child in an unstructured family are more closely associated with

school failure. The results also indicate that being a victim of crime, such as robbery and physical assault, significantly and positively affects school failure probabilities. Fear of crime, however, was positively significant at the neighborhood level only for the insecurity reported by girls aged 10–14.

Keywords: Fear of crime, Victimization, School failure.

JEL: C01, C25, I21

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