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Universidad Nacional de Colombia
Carrera 30 No. 45-03, Edificio 310, primer piso
Correo electrónico: revcuaeco_bog@unal.edu.co
Página web: www.ceconomia.unal.edu.co
Teléfono: (571)3165000 ext. 12308, AA. 055051, Bogotá D. C., Colombia

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ARTÍCULO

MICROECONOMETRIC ANALYSIS OF BOOK READING IN UNEQUAL URBAN CONTEXTS. THE CASE OF CARTAGENA DE INDIAS (COLOMBIA)

Aaron Espinosa Espinosa, Luis Palma Martos, Paula Barrios Bueno

Espinosa Espinosa, A., Palma Martos, L., & Barrios Bueno, P. (2025). Microeconometric analysis of book reading in unequal urban contexts. The case of Cartagena de Indias (Colombia). ***Cuadernos de Economía, 44*****(96), 1093-1123.**

Among the major Colombian cities, Cartagena de Indias exhibits the lowest book reading habit. This paper empirically analyses the factors associated with book reading as a form of cultural participation between 2011 and 2019. We evaluate the role of traditional and local variables in individual decisions to read, using microdata from the Cartagena Como Vamos (CCV) program to estimate a pseudo panel

A. Espinosa Espinosa
Universidad Tecnológica de Bolívar, Instituto de Estudios en Desarrollo, Economía y Sostenibilidad (IDEEAS). Cartagena (Colombia). Email: aespinosa@utb.edu.co

L. Palma Martos
Universidad de Sevilla, Departamento de Economía e Historia Económica. Sevilla (España). Email: lpalma@us.es

P. Barrios Bueno
Universidad Tecnológica de Bolívar, Instituto de Estudios en Desarrollo, Economía y Sostenibilidad (IDEEAS). Cartagena (Colombia). Email: barriosp@utb.edu.co

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that models reading habit persistence. Book reading behaves atypically in relation to age and income. In addition to the effects of local variables, such as stratification, poverty, and social capital, time availability notoriously restricts the possibilities of enjoying reading.

Keywords: Reading books; cultural participation; probit models; pseudo-panel models; Cartagena de Indias.
JEL: C25, D12, R22, Z10, Z11.

Espinosa Espinosa, A., Palma Martos, L., & Barrios Bueno, P. (2025). Lectura de libros en contextos urbanos desiguales: un análisis microeconométrico de Cartagena de Indias. *Cuadernos de Economía, 44*(96), 1093-1123.

Entre las principales ciudades colombianas, Cartagena de Indias presenta el hábito de lectura de libros más bajo. Este artículo analiza, de manera empírica, los factores asociados a la lectura de libros como forma de participación cultural en esta ciudad caribeña colombiana entre 2011 y 2019. Se evalúa el papel de variables tradicionales y locales en la decisión individual de leer, y se utilizan microdatos del programa Cartagena Cómo Vamos para estimar un pseudopanel que modela la persistencia del hábito de lectura. La lectura de libros se comporta de manera atípica en relación con la edad y los ingresos; además de los efectos de variables locales como la estratificación, la pobreza y el capital social, es el tiempo disponible, sujeto al rol de los individuos, la variable que más restringe las posibilidades de disfrutar de la lectura.

Palabras clave: lectura de libros; participación cultural; modelos probit; modelos de pseudopanel, Cartagena de Indias.

JEL: C25, D12, R22, Z10, Z11.

INTRODUCTION

Books plays a fundamental role in cultural reflection. As Borges (1952, p. 27) noted, a book is not only "a verbal structure" but also "an infinite dialogue" between author and reader, shaped by interpretation. From an economic perspective, Throsby (2020, pp. 168-169) defines books as cultural goods that "embody, store, or yield cultural value" alongside their economic value, based on attributes such as aesthetic quality, symbolic meaning, and historical significance. Within the capability framework, reading constitutes a functioning —a state of well-being— that enables the fundamental freedom of literacy, which in turn contributes to improved outcomes in productivity, reproductive health, nutrition, political participation, and social interaction (Sen, 2005).

In the field of cultural economics, book reading is a key cultural activity, not only because of its educational and symbolic value but also from a cultural economics perspective. In addition to fostering human and cultural capital, it generates positive externalities, functions as an experience good, and contributes significantly to the development of cultural industries and broader cultural participation (Ateca-Amestoy, 2010; Cameron & Trivedi, 2005; Throsby, 2001).

This study examines Cartagena de Indias, a city with the highest levels of monetary poverty and social exclusion among Colombia's major urban centres (Ayala & Meisel, 2016). These challenges are compounded by pronounced ethnic and spatial segregation, limiting access to public and merit goods (Espinosa et al., 2018). According to the Cartagena Cómo Vamos (CCV) program, approximately 33 % of residents reported reading books in recent years—second only to newspapers (34 %)—although participation has sharply declined. By 2022, post-pandemic data showed that only 15 % reported reading a book in the past year, half the rate in Bogotá (31 %).

Several factors highlight the relevance of studying Cartagena. The decline in reading coincides with a sustained deterioration in education quality, as reflected in standardized test results (Meisel & Granger, 2022). Reading practices are also spatially and socially stratified, mirroring broader urban inequalities. Moreover, existing empirical studies (Gamboa & Reina, 2006; López, 2008; Palma et al., 2014) rely on nationally representative data with limited territorial disaggregation and often apply cross-sectional analysis. These limitations hinder the understanding of reading as a habit formed through repeat consumption and learning (Lévy-Garboua & Montmarquette, 2001).

This study aims to identify and empirically analyse the determinants of book reading in Cartagena using a cultural economics framework. Drawing on micro-data from CCV, contextual variables, and a pseudo-panel estimation strategy, it assesses habit persistence in reading behaviour over time (2011–2019). The analysis considers both conventional factors—income, time, and cultural capital—and structural and territorial variables that capture intra-urban inequality.

The study makes three main contributions. First, it applies a replicable methodology to examine the persistence of reading habits, offering a model for similar unequal urban contexts in Colombia and Latin America. Second, it empirically evaluates a set of factors that expand both the conceptual and empirical reach of the traditional explanatory framework, grounded in models of rational addiction and learning-by-consuming (Becker, 1965, 1974; Becker & Murphy, 1988; Lévy-Garboua & Montmarquette, 1996). Finally, the study provides input for the design of spatially and territorially-informed public policies, thereby improving the targeting of actions by governments and other organizations to promote reading.

The next section of this paper presents the theoretical background and a review of the most relevant literature on this cultural activity. The third section explains the dataset, methodology, and empirical strategy used to address the research question. The fourth presents descriptive and empirical results obtained from the estimation of a continuous cross-sectional model (pseudo-panel). In the final section, the findings are discussed and the study's conclusions are presented.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

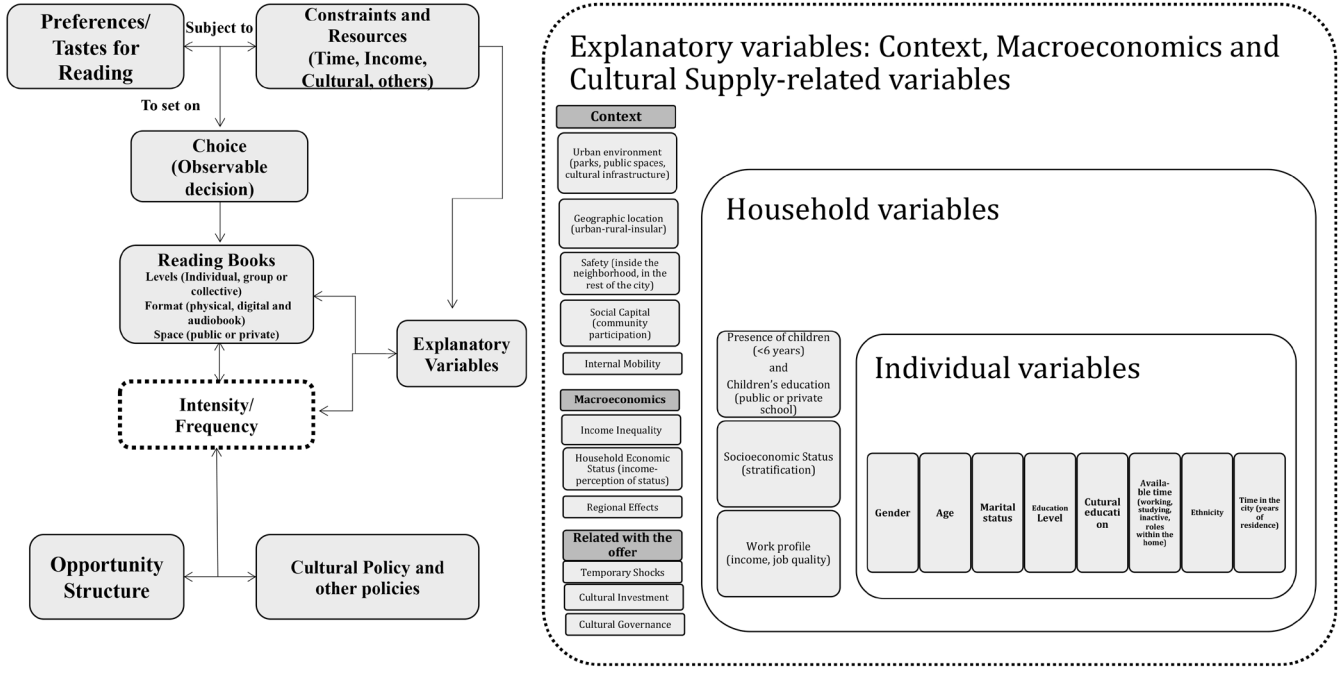
Book reading as an economic decision

This study is grounded in three key frameworks: the theory of demand for cultural goods by Lévy-Garboua and Montmarquette (1996, 2001), Throsby's concept of cultural capital, and Ateca-Amestoy's empirical research on cultural participation (2009, 2010, 2016). Lévy-Garboua and Montmarquette conceptualize cultural goods as experience goods, where utility is built through learning and habit formation. Cultural taste, they argue, is acquired—not innate—and shaped by education and socialization (Lévy-Garboua & Montmarquette, 2001).

Throsby (2001, 2020) defines cultural capital as a distinct form of capital that underpins both the supply and demand of cultural goods. It is cumulative, closely related to human capital, and contributes both economic (use, consumption, investment) and cultural (identity, memory, creativity, cohesion) value. This dual value justifies public intervention in cultural sectors—particularly where market failures prevent the full realization of social benefits, such as in reading policies in socioeconomically unequal cities (Throsby, 2001).

Ateca-Amestoy (2009, 2010) and Ateca-Amestoy et al. (2017) identify both individual (education, income, age, gender, family background) and contextual (geographic access, cultural infrastructure) factors as significant drivers of cultural participation. These perspectives coincide in emphasizing that cultural consumption is shaped not only by prices and income but also by preference formation, time allocation, and cultural capital accumulation.

Figure 1.
Explanatory factors and dimensions of cultural participation in book reading



With a focus on book reading—and following UNESCO's (1985) definition and Martinell's (2013) framework—participation can be analysed across levels, formats, and spaces (Figure 1). In the first dimension, the decision to engage in reading may be individual, group-based (e.g., reading clubs), or collective, as in the case of public or private reading promotion programs. The second dimension focuses on the medium through which reading occurs—whether traditional (print), digital, or newer formats such as audiobooks. Finally, book reading takes place in either private or public spaces, where reading conditions and the level of interaction vary (e.g., at home, in the workplace, or on public transport).

Reading is a deliberate, time-distributed activity aimed at enhancing individual capabilities through knowledge and cultural enrichment (Canoy et al., 2006). It involves the allocation of resources—such as time, access devices, or transportation—to attain cultural experiences that foster cognitive engagement and future cultural consumption (Fernández & Prieto, 2009).

Reading, as an economic decision, is driven by individual preferences and constrained by resources—primarily time and income (Figure 1). Books, as cultural goods, involve cumulative preferences that evolve through consumption (Gray, 2003; McCain, 2003; Throsby, 2001). This dynamic reflects mechanisms of rational addiction and experiential learning, where preferences are shaped through prior engagement (Levy-Garboua & Montmarquette, 1996).

Beyond time, income, and cultural capital, structural factors also influence reading behaviour. Aguado and Palma (2015) emphasize the role of broader determinants in shaping the economic and social valuation of cultural participation. Espinosa (2022) empirically identifies such factors—spanning individual (e.g., poverty, ethnicity, migration), household, and contextual dimensions (e.g., stratification, social capital, infrastructure)—and estimates their impact on cultural and sports participation in Colombia's five major cities. These findings highlight how leisure choices are embedded in wider inequalities in income and access, reflecting regional disparities (Meisel & Hanh, 2020).

Evidence from literature

Research on book reading has taken multiple approaches, generally situated within the framework of the economics of books (Canoy et al., 2006). Key areas of analysis include access mechanisms—primarily public library lending (Løyland & Ringstad, 2008, 2011)—and book demand, influenced by market variables such as price (Barrot et al., 2015; Ringstad & Løyland, 2006; Villarroya & Escardíbul, 2010). Early Scandinavian studies underscore the role of libraries in mitigating access barriers, treating books as merit goods. This effect is more pronounced when controlling for age and education.

A related strand focuses on consumption and participation, linking reading behaviour to microeconomic and individual-level variables (Canoy et al., 2006;

Fernández-Blanco & Prieto Rodríguez, 2009). These studies incorporate demographic and socioeconomic indicators, as well as proxies for cultural capital—both physical (e.g., reading devices) and specific (e.g., stated genre preferences).

Book reading also drives the creative economy, serving as an input for industries such as publishing, film, television, and gaming. Ateca-Amestoy (2010) highlights a positive correlation between reading habits and broader cultural participation, which strengthens local cultural ecosystems and generates employment in knowledge-intensive sectors.

In Colombia, the study by Palma et al. (2014) stands out for examining factors that influence book reading and library attendance using data from the Colombian National Department of Statistics (DANE) cultural consumption survey. The authors estimate multilevel logistic regressions, showing that educational level and socioeconomic status positively affect the decision to read. According to the variation measure estimated in the study, a significant proportion of the propensity to read can be attributed to unobserved neighbourhood factors, underscoring the role of the local environment in fostering reading habits (Palma et al., 2014). However, despite the progress represented by this work, the survey used lacks sufficient territorial representativeness, limiting its applicability for designing local public policies.

Another representative study on Colombia is that of Gamboa and Reina (2006). The study suggests a displacement of book reading toward other formats, particularly digital content on the internet, and highlights the substitutability between the two due to the time constraints faced by Colombians. It also proposes a hypothesis for the decline in reading rates in the country: the low purchasing power of the population.

METHODOLOGY: DATA SET AND EMPIRICAL STRATEGY

Data set

This study utilises microdata from the Encuesta de Percepción Ciudadana (EPC) of the CCV program, covering the period from 2011 to 2019. The EPC data are complemented with annual aggregated variables from DANE, such as household income. The survey is conducted annually across households, sampling between 1100 and 1250 individuals aged 18 and older that reside in dwellings across six socioeconomic strata. The sampling design is multi-stage, stratified by socioeconomic level, and clustered by cartographic sections, with a 95 % confidence level. It gathers self-reported information about household participation in book reading over the past year (Table 1, participation in cultural activities, option 10). Following Aguado and Palma (2015) and Espinosa (2022), a set of variables was included to better capture the structural factors that influence participation, as well as the heterogeneity and importance of the local context (Table 1).

Table 1.
Study variables (definition, characteristics, and typology)

Variable	Definition	Typology	Description	Factor/ Variable
Participation in cultural activities	Cultural activities take place in the city during the year. In which of the activities described in this card did you participate in the last year? 1. Theatre 2. Cinema 3. Concerts 4. Fairs 5. Conferences 6. Popular festivities 7. Gatherings 8. Carnival 9. Visit museums/galleries/libraries/ cultural houses 10. Read books 11. Read newspapers/magazines. 12. Visit monuments/historical sites. 13. Other. Which one? _____ 14. None	*Dummy* (D)	1 = Participates in activity 10 on the list; 0 = Does not participate in reading books	Dependent
Gender	Gender of the head of household	D	1= Male; 0= Female	Traditional
Age	Age range of those who participate in carnival activities	Ordered (O)	1= 18 to 25 years; 2= 26 to 35 years; 3= 36 to 45 years; 4= 46 to 55 years and 6= Older than 55 years.	Traditional

(*Continued*)

Variable	Definition	Typology	Description	Factor/ Variable
Time availability	Do you currently...?	D	1 = Retirees; 2 = Work outside the home; 3 = Work at home; 4 = Study; 5 = Work and study; and 6 = Head of household.	Traditional
Human capital	Educational level	O	1 = None; 2 = Primary education; 3 = High school; 4 = Tertiary education (university undergraduate + postgraduate: specialization, master's or doctorate).	Traditional
Income per inhabitant	Per capita income of the expenditure unit (household) of Cartagena	Continue (C)	In constant Colombian pesos of the year 2015.	Traditional
Objective poverty (Lack of food)	Did you skip any one of the three meals of the day in the past week?	D	1= Yes; 0=No	Structural
Subjective poverty (self-perception)	Do you consider yourself poor?	D	1= Yes; 0=No	Structural
Socioeconomic status	Socioeconomic stratification	O	Low level = strata 1 and 2; Medium: strata 3 and 4; High: 5 and 6	Structural
Social capital	Belongs to a community-based organization other than cultural (civic, professional, sports, religious, social clubs, among others.)	D	1= Yes; 0=No	Structural
Place of residence (Fixed effects)	*Dummy* by locality: 1) Virgen and Turística, 2) Histórica and Caribe Norte, 3) Industrial and de la Bahía).	D	1 = Yes (reference locality) 0 = Rest of localities	Structural

The dependent variable, book reading, adheres to UNESCO's definition: "a non-periodical printed publication consisting of at least 49 pages, […] published in the country and made available to the public" (UNESCO, 1985, p. 147). However, the EPC also includes digital formats and audiobooks. Regarding the reasons for reading, the EPC aligns with the criteria established by DANE's cultural consumption survey, which includes motives such as enjoyment, work requirements, educational demands, general culture, and sharing with children, among others (DANE, 2023).

The model includes traditional variables such as gender, age, available time, human capital, and per capita household income. Human capital is defined following Ateca-Amestoy (2009) as a stock used to generate cultural consumption experiences—here, book reading—and is proxied by formal education, as the Cartagena Como Vamos- Citizen Perception Survey (CPS) lacks data on specific education on culture.

The time availability variable is inferred from household roles, as it is not directly measured by the survey. For example, individuals who work and study are assumed to have limited discretionary time, regardless of their income level. Household income corresponds to the expenditure unit income reported by DANE, which reflects intra-household income disparities.

Finally, structural variables include socioeconomic strata, poverty status, local security (at neighbourhood and city levels), and social capital, capturing contextual inequalities in access to resources and opportunities (Figure 1). Although book reading correlates positively with library use (Aguado et al., 2018; Palma et al., 2014), the survey aggregates this with museum and gallery visits, and is therefore excluded from the analysis.

Empirical strategy

Given the binary nature of the dependent variable, Probit models are estimated within a pseudo-panel framework. These models, grounded in the random utility theory (McFadden, 1973), assume individuals derive utility from engaging in cultural activities such as book reading. Estimating separate cross-sections poses endogeneity concerns due to omitted variables and simultaneity.

To address this, fixed effects can be introduced to control for unobserved time-invariant heterogeneity. Although true panel data are unavailable, a pseudo-panel approach (Deaton, 1985) enables consistent estimation under certain conditions (Verbeek, 2008). Common strategies include the use of cohort dummies (Collado, 1997) and instrumental variables (Deaton, 1985; Moffitt, 1993).

Following Moffitt (1993), Mardones & Zapata (2019), and Espinosa et al. (2021), the empirical specification models the probability of book reading participation for individuals in household i in locality j of Cartagena, using T repeated cross-sections:

$$Y_{ijt} = x'_{ijt}\beta + \emptyset_{ij} + \varepsilon_{ijt} \qquad i,j = 1,\dots N;\ \ t = 1,\dots T \tag{1}$$

In equation (1), Y_{ijt} is the dependent variable for observation *ij* at time *t*; β is the vector of coefficients representing the effects of the explanatory variables on the dependent variable; X_{ijt} is a K-dimensional vector of explanatory variables; and ε_{ijt} is the error term, which captures the unexplained differences between the dependent variable and the linear combination of the explanatory variables and their associated effects.

Instrumental variable (IV) estimation is a standard approach for identifying Equation 3 (Moffitt, 1993). Following Moffitt (1993) and Espinosa et al. (2021) in the context of Colombian leisure activities, the analysis employs dynamic binary choice models with IV estimators derived from cohort-time interactions. This pseudo-panel strategy, based on homogenous cohorts, enables fixed effects estimation. As Moffitt notes, the within-cohort estimator in this framework is equivalent to two-stage least squares using individual data, with cohort-time interactions serving as valid instruments.

Moffitt's procedure is equivalent to decomposing the individual fixed effects $\emptyset_{ij}$ into a cohort effect $\emptyset_{ct}$ and an individual-specific deviation:

$$\emptyset_{ij} = \sum_{c=1}^{C} \emptyset_c W_{cij} + \mu_{ij} \tag{2}$$

Where W_{cij} is a binary (dummy) variable equal to 1 if household *i* in locality *j* belongs to cohort *c*. This variable essentially identifies the cohort to which each household belongs, based on the available data.

Given that the proposed model is estimated by using a two-stage instrumental variables strategy, the corresponding equations for each stage are explicitly presented in line with the empirical structure of the analysis. The first stage models the relationship between potentially endogenous explanatory variables and a set of instruments constructed from cohort and time information. This stage is specified as follows:

$$X_{ijt} = \Gamma Z_{ct} + \eta_{ijt} \tag{3}$$

Where X_{ijt} is the vector of explanatory variables, Z_{ct} represents the instruments (such as cohort means or time dummies), Γ is the vector of parameters to be estimated, and η_{ijt} is the first-stage error term.

In the second stage, the explanatory variables are replaced with their predicted values from the first stage (x_{ijt}) and used in the structural equation of the model:

$$Y_{ijt} = x'_{ijt}\beta + \sum_{c=1}^{C} \emptyset_c W_{cij} + \mu_{ij} + \varepsilon_{ijt} \quad (4)$$

In equation (4), if $\emptyset_c$ is correlated with the vector of explanatory variables x'_{ijt}, then it is likely that the individual deviations μ_{ij} and x'_{ijt} are also correlated, which may bias the estimated coefficients. However, if the instruments for x'_{ijt} are assumed to be uncorrelated with $\mu_{ij} + \varepsilon_{ijt}$, then instrumental variable (IV) estimation yields consistent estimates.

To address potential endogeneity, social capital is instrumented, considering two primary sources: reverse causality—where reading may influence group participation and vice versa—and omitted variable bias, particularly the absence of variables such as specialized educational background (e.g., participation in literary or journalistic workshops) due to data constraints (Ateca, 2009). Instrumental variables also help correct for measurement error, a common issue in pseudo-panel data models.

The Moffitt estimation method is applied, constructing age cohorts by locality and year following Espinosa et al. (2021), based on the methodology of Guillerm (2017) and Mora and Muro (2014). This strategy maintains cohort representativeness while ensuring sample adequacy and mitigating selection bias. Moffitt's approach is preferred due to (a) its robustness to cohort size variability and (b) the interpretability of its estimators, analogous to Probit or Logit models in terms of predicted probabilities.

Guillerm (2017) proposes three criteria for defining cohorts: (a) Each individual must belong to only one cohort, (b) Similar individuals must remain in the same cohort over time, and (c) To minimize errors, a large number of cohorts with substantial observation sizes should be constructed. Verbeek and Nijman (1993) recommend at least 100 individuals per cohort to obtain robust estimates. As shown below, the sample includes 8302 observations divided into 40 cohorts for the three localities in Cartagena (Table 2).

Table 2.
Cohorts by age and localities by year in Cartagena de Indias, 2011-2019

Cohort / year	2011	2012	2013	2015	2016	2017	2018	2019	Total
18-25	241	197	220	185	204	207	228	152	1634
26-35	194	200	189	203	219	206	181	182	1574
36-45	193	168	170	269	166	223	180	205	1574
46-55	168	156	160	226	178	189	182	219	1478

(*Continued*)

Cohort / year	2011	2012	2013	2015	2016	2017	2018	2019	Total
More than 55	204	280	261	253	242	187	252	363	2042
Total	1000	1001	1000	1136	1009	1012	1023	1121	8302

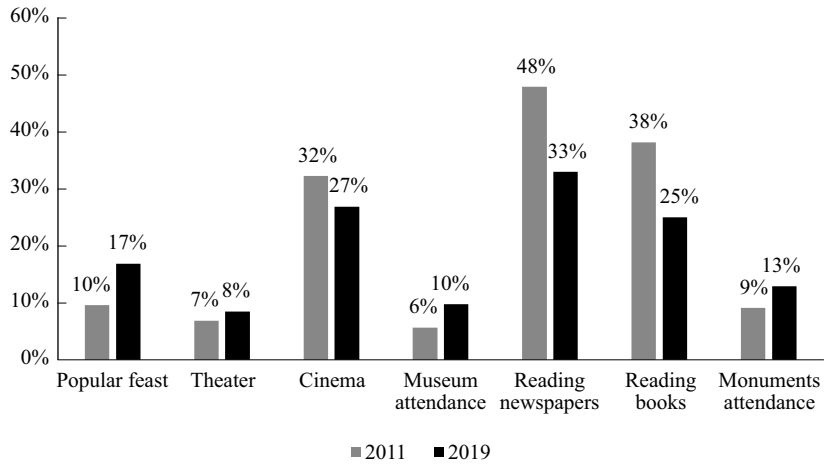
*: The year 2014 is omitted because that year the rural area was equated to a locality. With the addition of this year, the total number of observations is 9204 (see Annex 2).
**: Annual data include all three localities. The data are presented annually to show compliance with Verbeek and Nijman's recommendations.

RESULTS

Stylized facts

In Cartagena, book reading is the second most common cultural activity, though participation has declined over time (Figure 2). On average, 29 % of the population reported reading at least one book annually, slightly below newspaper reading (33 %), the highest reported activity. Both show high temporal variability (Annexes 1 and 2). As previously noted, Cartagena ranks below the national average in reading habits, reflecting the persistent shortcomings of its public education system (Meisel & Granger, 2022). According to DANE's National Reading Survey (2017), residents of Cartagena read an average of four books per year, compared to seven in Medellín and a national average of five.

Figure 2.
Evolution of participation in cultural activities in Cartagena de Indias, 2011-2019



As noted by Aguado et al. (2018) and Palma et al. (2014), book reading behaves as a complementary good to library attendance. Access occurs via public (libraries)

and private (bookstores) channels. While the CPS does not track library attendance directly, data on the local library network was available. From an economic standpoint, public libraries may cease to act as merit goods when congested or poorly managed (Friehe & Baumann, 2019). Bookstores function as market mechanisms for book access, though high book prices increase demand for public borrowing (Løyland & Ringstad, 2008).

Cartagena has 19 public libraries, 13 (68 %) of which are in Locality 2 (La Virgen y Turística), the area with the highest incidence of poverty. The remaining libraries are evenly distributed between Locality 1 (Histórica y del Caribe Norte), which exhibits the highest living standards, and Locality 3 (Industrial y de la Bahía). Although both libraries and bookstores serve as key infrastructures that facilitate book reading, Cartagena exhibits one of the lowest rates of access to public libraries and bookstores among the major Colombian cities (Table 4).

Furthermore, the city registers the lowest density of libraries per square kilometre, highlighting the influence of factors such as urban mobility, time availability, and other local environmental conditions on this form of cultural participation. As shown in Table 3, when compared with Cali—a city of similar land area and twice the population, located in western Colombia —Cartagena has only half the number of bookstores and four times fewer public libraries.

Analysis of CPS-based cohorts reveals significant disparities in book reading across age groups and localities, with a notable decline from 2011 to 2019 (Figures 3A and 3B). In 2011, individuals aged 55 and over showed the highest participation but, by 2019, they recorded the lowest. Locally, the Histórica y Caribe Norte zone reported the highest reading rates, while the Virgen y Turística, and the Industrial y de la Bahía zones showed the lowest. These patterns suggest that book reading, as a cultural good, is strongly influenced by the population's socioeconomic conditions.

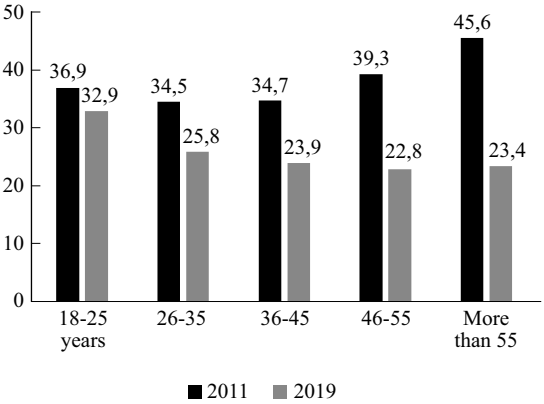
Despite these constraints, Cartagena has implemented reading promotion initiatives. The most notable is Leer el Caribe, a cultural policy program that for over 22 years has engaged approximately 11 000 public school students at the lower and middle education level. Aimed at stimulating cultural demand, the program provides access to literature by Caribbean Colombian authors, offering teacher training, literary analysis workshops, and student-author encounters in schools, libraries, and bookstores (Banco de la República, 2025).

Table 3.
Basic infrastructure to support reading in Cartagena and major Colombian cities (comparative)

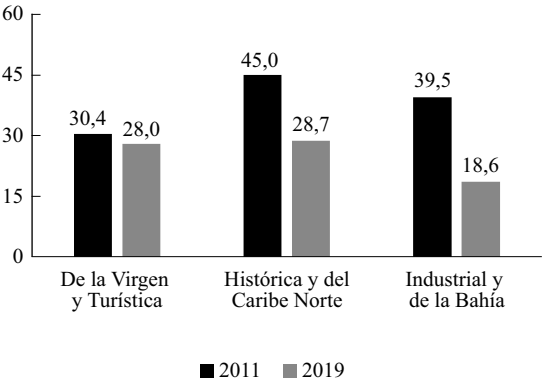
	Bookstore (N°)	**Public libraries (N°)**	**Neighbourhoods (N°)**	**Bookstore (per 100 000 inhabitants)**	**Public libraries (per 100 neighbourhoods)**	**Agglomeration (Bookstore + Libraries /Km2)**
Cartagena	29	19	205	2.76	6.83	0.08
Bogotá	192	27	1922	2.39	1.40	0.13
Medellín	130	26	275	4.81	9.45	0.41
Cali	54	64	249	2.37	25.70	0.19
Barranquilla	39	5	188	2.94	2.66	0.29
Bucaramanga	56	7	200	8.96	3.50	0.39

Figure 3.
Book reading by age and locality (cohorts), 2011–2019

3A. Reading rate by cohort according to age (%)



3B. Reading rate by cohort according to locality (%)



To deepen the analysis, the CPS data are explored to determine whether differences between book readers and non-readers are statistically significant within the sample collected during the study period. Specifically, whether these differences can be attributed to each variable theoretically linked to the decision to participate in this activity (Table 4).

The first result indicates that there are statistically significant differences between book readers and non-readers in Cartagena, based on the variables influencing the individual decision to participate in this cultural activity. Book consumers in Cartagena generally exhibit medium to high levels of cultural capital, as evidenced by

the fact that over 80 % have secondary or higher education. More than half (55 %) of the participants have secondary education, indicating that book reading is not exclusively concentrated in the city's segments with the highest cultural capital.

Most readers are aged 55 and older, although this age group also represents the largest number of non-readers. Differences in time availability between readers and non-readers are significant and vary based on employment or educational status. For example, differences are notable among those who work and study, only study, or are theoretically more available, such as retirees and unemployed individuals.

Table 4.
Profile of book readers and non-readers in Cartagena (means difference test), 2011-2019

Variable: Reading books (No, Yes)	**No (N = 5534)**	**Yes (N = 2768)**	**Mean Difference Tests**
Gender (Male=1; Woman=0)	0.456	0.472	
Age			
18 - 25	0.184	0.211	**
26 - 35	0.196	0.178	*
36 - 45	0.200	0.173	**
46 - 55	0.183	0.171	
> 55	0.238	0.267	**
Educational Level			
None	0.022	0.012	***
Primary	0.160	0.115	***
Secondary	0.569	0.497	***
Tertiary	0.250	0.377	***
Available Time			
Work outside the home	0.323	0.313	**
Work at home	0.100	0.090	
Study	0.089	0.143	***
Study and Work	0.017	0.020	**
Retiree	0.054	0.112	***
Unemployed	0.158	0.091	***
Poverty			
Subjective (self-perception)	0.312	0.241	***

(*Continued*)

Variable: Reading books (No, Yes)	No (N = 5534)	Yes (N = 2768)	Mean Difference Tests
Objective (did not consume one of the three daily meals in the past week)	0.247	0.184	***
Socioeconomic Status (Stratification)			
Low (1 y 2)	0.531	0.449	***
Middle (3 y 4)	0.279	0.326	***
High (5 y 6)	0.071	0.132	***
Place of residence			
Histórica y del Caribe Norte	0.318	0.349	**
Virgen y Turística	0.350	0.312	***
Industrial de la Bahía	0.332	0.339	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

Finally, readers and non-readers differ according to structural variables, particularly the two types of poverty considered, socioeconomic strata, and place of residence. This is especially true in De la Virgen y Turística, which exhibit the highest levels of monetary and multidimensional poverty in the city. Notably, non-readers constitute most of the population in medium- and low-income strata (Table 4).

Empirical results

This section presents the empirical results obtained for book readers in Cartagena (Table 5). These results are shown across four models: (a) Pool Probit (without considering potential endogeneity issues), (b) IV-Probit including income, and (c) IV-Probit with the available time variable. The first two models are estimated for the full period (2011–2019), whereas the last model corresponds to the 2011–2015 period, given that after 2015 the CPS no longer includes this variable in its dataset.

As previously mentioned, cohorts constructed through dummies of age groups, locality, and years are used as instruments to capture fixed effects. The first step is to test whether the instrument is consistent, that is, whether it passes the exogeneity test. In other words, the instrument must be sufficiently correlated with the endogenous explanatory variables in the model. To ensure this condition (Mardones & Zapata, 2019), a test for weak instruments was conducted, yielding a test F-statistic well above the critical threshold proposed by Stock and Yogo (2005). Consequently, the null hypothesis of weak instruments is rejected, thereby validating the relevance of using the cohorts in the estimation process (see Wald test in Table 5).

We subsequently calculated the marginal effect of the set of variables considered. The models yield expected results in terms of signs and statistical significance, for both traditional variables such as human capital and leisure time and structural

variables such as poverty, stratification, and social capital, as well as related goods. The estimated cohorts show a contrasting initial result: the probability of reading books increases with age, regardless of the locality where individuals reside. The reading gap between older individuals (reference group) and young people is larger when leisure time availability is included than when only the income effect is considered.

Regarding gender, the estimators indicate no significant differences between men and women in book reading, except in the model that includes per capita income. When this occurs, women have a higher probability of reading books than men, although the significance is weak. Regarding human capital applied to book reading, which is measured by education level, the results align with expectations: individuals with higher human capital are more inclined to read books. The probability of reading among those with tertiary education (reference group) increases significantly more when income is considered than when time availability variables are added to the estimation.

Regarding the per capita household income level in Cartagena (Model 2), which is considered a macroeconomic variable, the coefficients are consistently negative across the estimated models. This suggests that, in general terms, book reading may behave as an inferior good—its consumption decreases as income increases—rather than as a normal good, which becomes more desirable with higher income. When time availability variables are included in the estimation (Model 3), the negative effect of income becomes more pronounced.

Another result suggesting that time plays a key role in understanding individual decisions to read books connects with the so-called related goods According to the estimation, book readers also engage in other leisure activities, such as participating in sports (either through physical activity or as spectators at events), as well as in cultural activities like attending the theatre, going to the cinema, and, particularly, reading magazines. Consumption of these goods behaves as complementary; however, it reduces the probability of book reading when participation in popular festivals is considered.

Table 5.
Results of the pseudo-panel model of book reading participation in Cartagena

Dependent variable: Reading books/ Type of models	**Model 1 Pool Probit (2011-2019)**	**Model 2 Moffit (with household income) (2011-2019)**	**Model 3 Moffit (with time availability) (2011-2015)**
	Marginal Effects (Std. Err.)	**Marginal Effects (Std. Err.)**	**Marginal Effects (Std. Err.)**
Cohort (Cohort 5: reference)			

(*Continued*)

Dependent variable: Reading books/ Type of models	Model 1 Pool Probit (2011-2019)	Model 2 Moffit (with household income) (2011-2019)	Model 3 Moffit (with time availability) (2011-2015)
	Marginal Effects (Std. Err.)	Marginal Effects (Std. Err.)	Marginal Effects (Std. Err.)
Cohort 1 (18-25 years)	-0.077*** (0.016)	-0.168*** (0.049)	-0.327*** (0.064)
Cohort 2	-0.098*** 0.016	-0.224*** (0.048)	-0.304*** (0.056)
Cohort 3	-0.088*** (0.015)	-0.209*** (0.046)	-0.195*** (0.057)
Cohort 4	-0.044*** (0.015)	-0.102*** (0.045)	-0.132** (0.057)
Gender			
Gender (men=1; women=0)	-0.011 (0.010)	-0.047* (0.029)	0.002 (0.039)
Cultural capital (Educational level) (Tertiary: reference)			
None	-0.185*** (0.040)	-0.614*** (0.119)	-0.219*** (0.125)
Primary	-0.126*** (0.018)	-0.462*** (0.055)	-0.101** (0.110)
Secondary	-0.090*** (0.011)	-0,311*** (0.036)	-0.028* (0.110)
Income			
Income (per capita of expenditure unit)	-0.560*** (0.038	-1.167*** (0.114)	-1.406*** (0.270)
Related goods			
Passive (attendance as a spectator)	0.048*** (0.013)	0.214*** (0.041)	-0.162*** (0.051)
Active (physical activity)	0.036*** (0.012)	0.194*** (0.040)	-0.152*** (0.047)
Theatre	0.151*** (0.017)	0.517*** (0.053)	0.028 (0.084)
Cinema	0.043*** (0.011)	0.210*** (0.035)	0.031 (0.040)
Independence Day (popular historical feast)	-0.050*** (0.012)	-0.095*** (0.037)	-0.189** (0.044)
Reading newspapers	0.187*** (0.009)	0.651*** (0.031)	0.236** (0.050)

(*Continued*)

Dependent variable: Reading books/ Type of models	Model 1 Pool Probit (2011-2019)	Model 2 Moffit (with household income) (2011-2019)	Model 3 Moffit (with time availability) (2011-2015)
	Marginal Effects (Std. Err.)	Marginal Effects (Std. Err.)	Marginal Effects (Std. Err.)
Structural variables			
Poverty			
Subjective (self-perception)	-0.024** (0.011)	-0.071** (0.034)	0.058 (0.039)
Objective (did not consume one of the three daily meals in the past week)	0.008 (0.013)	0.057 (0.038)	-0.079** (0.051)
Socioeconomic status (Rural area: reference)			
Low Strata (1+2)	-0.001 (0.016)	-0.021 (0.050)	0.066 (0.050)
Middle Strata (3+4)	0.004*** (0.018)	0.022 (0.054)	0.096* (0.057)
High Strata (5+6)	0.023** (0.023)	0.087 (0.070)	0.043** (0.080)
Social capital (Community participation)	-0.695*** (0.111)	-0.308*** (0.128)	-0.654*** (0.035)
Leisure time (Unemployed: reference)			
Work out of home			-0.257*** (0.053)
Work at home			-0.057 (0.071)
Study			-0.047 (0.079)
Study and work			-0.367** (0.144)
Head of household			-0.078* (0.057)
Retirees			0.015 (0.017)
Well classified observations (%)	71.49%	71.95%	72.45%
Number of observations	8104	8104	4137

Significance level of the test: *p < 0.1; **p < 0.05; ***p < 0.01.
Wald test of exogeneity Model 2 (/athrho = 0): chi2(1) = 63.08 Prob > chi2 = 0.0000
Wald test of exogeneity Model 3 (/athrho = 0): chi2(1) = 14.41 Prob > chi2 = 0.0001
Wald test of exogeneity Model 4 (/athrho = 0): chi2(1) = 16.18 Prob > chi2 = 0.0001

When controlling for the time variable, the results change significantly: participation in sports activities tends to decrease, while the degree of substitutability with popular festivals increases. The complementary relationship with magazine reading remains unchanged, although the probability of participation declines.

Regarding structural variables, the results are generally consistent. On the one hand, perceiving oneself as poor, without considering time constraints, reduces an individual's probability of reading books. On the other hand, when controlling for leisure time availability, it is objective poverty that reduces this probability of participation. In this regard, allocating more time to a time-intensive activity such as reading entails a high opportunity cost; therefore, individuals must prioritize addressing their most pressing need: obtaining food.

In the case of socioeconomic stratification, the estimates use Cartagena's rural population as the reference group, as this area of the city has historically recorded the highest poverty rates—surpassing even the most disadvantaged urban localities (Virgen y Turística, and Industrial y de la Bahía) (Alvis & Espinosa, 2013). The results are robust (correct sign and statistical significance) in Model 1 (Pooled Probit), while Model 2 (including income) and 3 (including time constraints) reveal wider participation gaps favouring the higher strata (5 and 6). As shown in Table 5, the introduction of fixed effects through cohort controls further accentuates the reading disparities in comparison to the lower strata of the city.

Finally, when analysing time availability (Model 3), the most affected groups are those working outside the home, individuals who both work and study, and heads of household. These groups share a common labour role, which enables them to generate some income; however, despite this apparent advantage, the negative sign of the marginal effect suggests they may face constraints in engaging in activities such as reading, which is time-intensive and asynchronous by nature.

DISCUSSION Y CONCLUSIONS

This article examines how both socioeconomic context and traditional rational choice variables influence book reading in Cartagena de Indias—one of Colombia's most unequal and impoverished cities. Drawing on a framework that models the persistence of time-intensive cultural consumption, it analyses reading decisions among comparable population groups over nearly a decade.

Book reading is shaped not only by standard socioeconomic factors—such as human capital relevant to cultural goods, age, income, and time availability—but also by contextual variables like multidimensional poverty, residential stratification, and forms of social capital that mediate cultural participation. A key contribution is the identification of specific dynamics often overlooked in studies from developed contexts. Notably, this study finds that in Cartagena, the likelihood of reading increases significantly after age 55—a pattern not captured in national analyses such as Palma et al. (2014), who do not identify this age cutoff point,

making it difficult to focus any potential reading promotion policy on Cartagena's population.

Second, there is no significant and conclusive evidence about the role of gender in the probability of reading books, unlike studies conducted in Colombia and other countries (López, 2008; Villaroya & Escardíbul, 2010). In this sense, there is no indication of a lower time opportunity cost for women, such as housewives, since men are the heads of the household in many Cartagena households.

This fact leads to a third distinct difference in the present study, as leisure time availability has a clear effect on book reading decisions in the city. For those engaged in productive activities inside or outside the home, the probability of reading decreases. This is particularly noticeable for those who work outside the home and combine this activity with studies. The results described clearly highlight the effect of time constraints on participation decisions (Model 3), even in the presence of improved income for the local population (Model 2).

The specific weight of the time constraint is observed in the change in participation in complementary activities such as sports, theatre attendance, cinema, and magazine reading. When this constraint is not considered, the idea emerges that Cartagena residents are omnivorous (Fernández-Blanco & Prieto-Rodríguez, 2009), given that participation in other cultural activities increases the probability of reading books (Palma et al., 2014). However, under time constraints, only magazine reading maintains a positive complementary relationship.

Likewise, the statistical significance of the structural variables indicates that book reading is an activity constrained by individuals' perception of their own vulnerability (subjective poverty), and, in more extreme cases, when the opportunity cost of allocating resources to non-essential goods becomes too high due to subsistence needs (objective poverty).

Furthermore, the estimation results reveal that book reading is a stratified and unequally distributed activity within the local territory. The significance of socioeconomic strata and age cohorts suggests that both socioeconomic status and place of residence influence reading decisions. This implies that traditional determinants—such as gender, income, leisure time, and human capital—are not sufficient to fully explain differences in participation. As shown, Cartagena exhibits the lowest number of libraries per neighbourhood and the lowest concentration of libraries and bookstores per square kilometre among the country's major cities, which may represent a spatial barrier to access cultural goods like reading.

As recent studies on poverty and inequality in the city have shown (Ayala & Meisel, 2016; Espinosa et al., 2019; Meisel & Granger, 2022), along with earlier research (Alvis & Espinosa, 2013), these structural issues are reflected in the unequal distribution of opportunities, disproportionately affecting the populations of the Virgen y Turística and Industrial y de la Bahía localities, which exhibit the lowest endowments of merit goods and public services. In this context, both the lower rate of

book reading and the limited access to libraries and bookstores in these areas are consistent with the spatial concentration patterns of such goods and services.

The discussion raises questions about the types of actions to be promoted to overcome existing barriers and expand reading in the local territory. The challenges of cultural policy involve understanding, first and foremost, that factors that improve reading go beyond individual will; in other words, actions must be coordinated with local governments' economic and social policies. Strategies that reduce poverty and expand secondary and university education coverage will improve reading.

This means there is ample room to create reading audiences in the lowest socioeconomic strata and rural areas, where participation rates are the lowest. A second action involves strengthening public investment on multiple fronts. First, in reading promotion programs in public schools and in collaboration with neighbourhood social organizations, particularly focusing on young and adult populations (18 to 45 years old) in rural areas and localities 1 and 2. And, second, in expanding infrastructure to improve access to libraries as spaces that allow low-cost participation and offer a broader range of cultural activities.

This study addresses some of the questions that, when answered, can help to uncover how individuals make decisions regarding book reading. Therefore, one of the challenges for future analyses is to incorporate reading frequency, which would open the door to further methodological contributions. Another challenge is to model the time variable more comprehensively and accurately. Although the variable available in the CPS allows for a partial observation of the constraints faced by individuals engaged in the labour market, there remains room for improvement through the design of more targeted and relevant survey instruments.

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ANNEX 1.

Descriptive statistics of book reading and the explanatory variables of participation, 2011-2019

Variable	Obs.	Mean	Std. dev.	Min	Max
Reading books	8302	0.315	0.464	0	1
Gender (Men = 1)	8302	0.465	0.499	0	1
Subjective poverty (self-perception)	8280	0.286	0.452	0	1
Objective poverty (did not consume one of the three daily meals in the past week)	8302	0.223	0.416	0	1
Income per capita (log)	8302	13 293	0.122	13 103	13 449
Age					
18 – 25 years	8302	0.197	0.398	0	1
26 - 35	8302	0.190	0.392	0	1
36 - 45	8302	0.190	0.392	0	1
46 - 55	8302	0.178	0.383	0	1
> 55	8302	0.246	0.431	0	1
Educational Level					
None	8302	0.017	0.129	0	1
Primary	8302	0.145	0.352	0	1
Secondary	8302	0.565	0.496	0	1
Tertiary	8302	0.274	0.446	0	1
Available Time					
Work outside the home	4137	0.322	0.467	0	1
Work at home	4137	0.090	0.286	0	1
Study	4137	0.113	0.317	0	1
Study and Work	4137	0.018	0.134	0	1
Housewife	4137	0.075	0.263	0	1
Retiree	4137	0.130	0.336	0	1

(*Continued*)

Variable	Obs.	Mean	Std. dev.	Min	Max
Socioeconomic Status (Stratification)					
High (5 y 6)	8302	0.510	0.500	0	1
Middle (3 y 4)	8302	0.293	0.455	0	1
Low (1 y 2)	8302	0.088	0.283	0	1
Place of residence (locality)					
Histórica y del Caribe Norte	8302	0.325	0.468	0	1
Virgen y Turística	8302	0.339	0.473	0	1
Industrial de la Bahía	8302	0.336	0.472	0	1

ANNEX 2.

Main cultural activities in Cartagena de Indias (statistical indicators), 2011-2019

	Popular festival	**Theatre**	**Cinema**	**Museum attendance**	**Reading newspapers**	**Reading books**	**Monuments attendance**
Mean	0.126	0.076	0.274	0.110	0.349	0.296	0.140
St. Deviation	0.040	0.033	0.033	0.057	0.086	0.085	0.067
Max	0.196	0.212	0.323	0.310	0.482	0.474	0.265
Min	0.046	0.034	0.175	0.032	0.117	0.127	0.019
St. Dev/Mean	0.317	0.427	0.121	0.520	0.247	0.286	0.480

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