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# Can Gender-Stereotyped Depictions of Occupations in Primary School Textbooks Help Shape Students' Career Choice in the Dominican Republic?

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(Can Gender-Stereotyped Depictions of Occupations in Primary School
Textbooks Help Shape Students' Career Choice in the Dominican Republic?)

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# Abstract

The purpose of this research is to examine whether the gender-stereotyped depiction of occupations in Dominican primary school textbooks can bias students' career choice and perpetuate gender inequalities in the Dominican Republic. Data shows that, despite a slight gender disparity in favor of girls during secondary education and the feminization of tertiary education in the Dominican Republic, collegial population is extremely segregated by gender and women are rarely found studying careers that are traditionally related to the opposite sex. This educational segregation has an adverse outcome for women since career choice is closely related to economic and social participation. Jobs in the fields of science, technology, engineering, and mathematics are found to grant higher salaries and hold higher social recognition. Female participation in the aforementioned disciplines is limited in the Dominican Republic, whereas women overpopulate traditional female careers such as teaching, nursing, or psychology.

This research will argue that, despite regulations towards the elimination of sexism in school textbooks, there is still a high incidence of gender-stereotyped occupations and sexism in Dominican primary school textbooks. On studying collegial trends amongst female and male students this research will examine if the depiction of gender-stereotyped occupations in primary school textbooks is linked to career choice. Finally, a study conducted among primary school children will show the effects of gender stereotypes in career choice and how the portrayal of traditional gender-typed occupations limits children's educational and professional identity, largely restricting Dominican students' potential to arbitrary gender roles.

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# Glossary

Gender: A psychological phenomenon that refers to learned sex-related behaviors and attitudes of males and females.

Gender identity: One's sense of maleness or femaleness; usually includes awareness and acceptance of one's biological sex.

Gender roles: Sets of behaviors and attitudes associated by society with being male or female and expressed publicly by the individual.

Gender typing: Acquisition of sex-appropriate preferences, skills, personality attributes, behaviors, and self-concept (also *sex typing*).

Sex: a person's biological status typically categorized as male, female, or intersex (i.e., atypical combinations of features that usually distinguish male from female). There are a number of indicators of biological sex, including sex chromosomes, gonads, internal reproductive organs, and external genitalia.

Self-concept: A person's mental model of his or her abilities and attributes.

Self-efficacy: The set of beliefs that one can perform adequately in a particular situation.

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# List of Acronyms

| | |
|---|---|
| CESDEM | Centro de Estudios Sociales y Demográficos |
| CIPAF | Centro de Investigación Para la Acción Femenina |
| EFA | Education For All |
| ENDESA | Encuesta Demográfica y de Salud |
| MESCyT | Ministerio de Educación Superior, Ciencia y Tecnología |
| MINERD | Ministerio de Educación de la República Dominicana |
| ONE | Oficina Nacional de Estadística |
| PISA | Programme for International Student Assessment |
| RAE | Real Academia Española de la Lengua |
| STEM | Science, Technology, Engineering, Mathematics |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |

# 1. INTRODUCTION

Textbooks are the first formal source of written information children are exposed to in the school environment. In public schools of low and middle-income countries, textbooks are often times the only source of written information school children will have access to. Through textbooks primary school children learn literacy and numeracy skills, they train their analytical abilities, they discover their nation's history, and they come to know about scientific facts. Also through textbooks school girls and boys learn about occupations and professional careers. Textbooks, in this way, play a main role in perpetuating or eliminating gender stereotypes and sex bias in occupations.

Career choice is a complex reality affected by a wide range of factors such as family's professional background, personal preferences and abilities, teachers' attitudes, estimated income, or social status, among others. Gender identity and stereotypes ascribed to professional careers can greatly influence such decisions, as well. Studies show that children's gender identity development occurs very early in life. Primary schools, thus, become paramount in helping children develop and shape their own identities, gender and otherwise.

Despite some efforts towards the elimination of gender bias and sexism in the Dominican school curriculum, the gender approach has been vaguely drafted and poorly implemented and strong gender occupational stereotypes still persist in primary school materials.

## 1.1. Origin

I have worked in the field of education in the Dominican Republic for almost four years now, first as a teacher, later as a high school principal, and now as an academic director. I have had experience in different educational settings in the Dominican Republic (private and public, rural and urban, and primary and secondary). When I first started I expected poorer communities to hold higher and stricter gender stereotypes than the more economically developed. I also expected to find a large degree of gender division in the labor market. However, learning about the gender segregation in college enrollment was very unsettling.

The most capable women in the country, with access to higher education, are massively choosing careers that perpetuate a traditional role of femaleness. The women that could potentially lead the change in gender equality are graduating from careers that allow little space for them to fight gender stereotypes. Women are accessing academic fields that do not necessarily lead to higher political participation, to decision-making careers, or to more economic power. I started wondering how did this situation come to be and what was biasing all these young women in the stages before they entered tertiary education.

Highly stereotyped gender identity is very salient in all aspects of the Dominican culture, and education is not an exception. Children are heavily shaped into gender appropriateness from an early age. Sex-arbitrary differences abound in colors, toys, gifts, or dress code. As a foreigner, I am often times forgiven for trespassing the gender rules of behavior, however, I constantly see students adhere to many norms that challenge the

very nature of gender equality, whether they want to or not. In many cases teachers' or parents' own gender bias and beliefs has led to wasted talent and skills going unnoticed. A classroom should always be, before anything else, a safe place for students free of stereotypes and judgment. However, this is far from the reality of many classrooms in the world, including Dominican classrooms.

The elimination of sexism in the Dominican society requires a change in policy and culture. It will take time to train all teachers in gender-sensitive issues, and even then some still might persist to impose their own beliefs. Books, on the other hand, are a powerful tool to portray men and women in non-traditional roles, providing children with images and role models that they have probably never seen before. The creation and selection of non-biased school materials is one of those policies that need to precede the change in culture because it would help ignite the process of change. Assuring the quality and gender neutrality of school textbooks becomes imperative in the fight against gender disparities.

### 1.2. Purpose

The purpose of this study is to provide a gender analysis of the school textbooks currently used in primary education in the Dominican Republic, especially in light of the ongoing curriculum reform the Ministry of Education (MINERD) is carrying out. This paper will analyze the current content of the teaching materials, focusing on the depiction of occupations and their relationship to gender, as well as in the female to male ratio of the characters shown in the books.

My study will show existence of sexism in the portrayal of occupations and a higher frequency in the display of male images than female. This research will then study the connection between gender-stereotyped occupations depicted in school textbooks to current career choice trends in the Dominican Republic. Finally, I will show the limiting impact traditional occupational roles have on primary school children.

1.3. Scope

My research is mainly concerned with primary school textbooks and the existence and effect of gender stereotypes on students' perspectives in terms of future career choice. Although many other factors play a big role in shaping students' selection of a professional path, my study focuses on school materials for three main reasons: 1) 80-90% of the school time is spent working with school textbooks; 2) in poor communities and most public schools in the Dominican Republic textbooks are the only learning resource available; 3) including a gender-sensitive approach to school textbooks would mean that the majority of Dominican school children would be exposed to non-biased content.

College enrolment rates, trends by gender, academic field, and major will also be studied from the official data provided by the Ministry of Higher Education, Science, and Technology (MESCyT) up the last academic year that has been made available (2012).

1.4. Target Audience

This research has been carried out bearing in mind the government officials, educators, publishers, and specialists who are part of the drafting of the new curricular reform in the Dominican Republic, as well as policy-makers and students interested in the

existence of gender bias in the Dominican school materials and the perpetuation of gender stereotypes.

    1.5. Research problem

    This study tackles three aspects regarding gender stereotypes in the school system in the Dominican Republic. The first topic addressed is whether traditional gender stereotypes exist in the Dominican primary textbooks. Upon finding out that there is, indeed, a gender bias in terms of the portrayal of occupations in school textbooks I study the possible connection between college trends in the past few years and the bias in occupations shown in the textbooks. Finally, my research moves on to the effect that gender prejudices have on school children's own gender identification with professional roles.

    1.6. Conceptual Framework

    The guiding theoretical framework of this study draws upon social-cognitive theories, stating that gender role development is the result of two things: children's own cognitive processing and the ideas and values of gender encoded in their culture.

    For the textbook analysis I used UNESCO's analytical checklist for the identification of sexism in school's textbooks, developed by the French sociologist Andre Michel in 1986. I chose the simplified sexist stereotype checklist since my focus was on the graphic portrayal of occupations and female to male appearance ratio. Following UNESCO's guidelines the analysis is divided in 3 sections: 1) Comparative analysis of the number of male and female references (in pictures and text); 2) Comparative analysis

of male and female occupational activities (in pictures); 3) Comparative analysis of occupations relating to males and females (in text).

The second part of my research analyzes the data available for tertiary education enrollment rates per sex and academic field from 2005 to 2012, and creates a visual picture of what the college trends among Dominican women look like, using the General Report on Higher Education Statistics, issued by the Ministry of Higher Education, Science, and Technology. This section of my research also uses data gathered by the Ministry of Education on the results of Dominican National Tests (*Pruebas Nacionales*) for primary and secondary education. The purpose of this data is to compare test achievement between Dominican female and male students, specially in math and science, in order to examine the popular belief that boys are better in hard science subjects due to better visual-spatial skills, which ultimately leads to a larger male ratio in such careers. Data from the National Office of Statistics (*ONE*) will be used as a main source of information as well.

Finally, for the study I conducted among school children to assess whether exposure to gender-stereotyped material could bias their career preference, I selected two groups of 27 children between 8 and 10 years of age. Following Bem's Gender Schema Theory, children who are 4 or 5 years old and up already show "*sex-appropriate preferences, skills, personality attributes, behaviors, and self-concepts*"[1]. I then narrowed the age range to 13 years old in order to avoid the puberty years. The final selection was

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[1] Sandra Lipsitz Bem, "Gender Schema Theory and Its Implications for Child Development: Raising Gender-Aschematic Children in a Gender-Schematic Society," *Signs: Journal of Women in Culture and Society,* vol. 8, no. 4, 1983. (Bem 1983)

made on the grounds of availability of children in the same age group able to participate in the study.

### 1.7. Limitations

The first limitation of this study is linked to the scope. The analysis of the school textbooks should be broadened beyond graphic representations to include content and language analysis from a gender approach. Since my main concern was limited to the portrayal of occupations, I narrowed my examination to the depiction of professional careers and the gender given to the name of those careers. However, in order to fully revise and eliminate the existence of gender bias in Dominican school textbooks a full analysis should be conducted. Publishers would benefit from this data, as would the Ministry and official organisms in charge of the revision and custody of the formal curriculum.

Secondly, the sample of children I used to conduct my experiment on the effect of gender-biased versus gender-neutral materials in primary school children is too small to be representative for the state of school children in the Dominican Republic. Further and larger studies should be conducted in order to assess the extent to which these stereotypes impact children. Future studies should also look at the different variables that can potentially play a role in the degree gender bias affects school children, such as socioeconomic background, age, or academic abilities.

Finally, the data gathered for the college enrolment trends is limited, due to the unavailability of gender-segregated data by career prior to 2005 and after 2012. The Official Reports on Higher Education Statistics only offer enrollment data segregated by

gender in the 15 most populated careers, given the fact that these 15 careers gather 75% of the total Dominican college population. As more data becomes available further studies will be able to better assess and establish the factors impacting career choice, especially among young Dominican females.

**2. LITERATURE REVIEW**

The distinction between man and woman is found everywhere from religious sacred books, to public bathrooms, or language grammar. The female/male juxtaposition is one of the guiding principles around which societies are formed, and one of the most researched, theorized, politicized, and tested topics. This thesis is concerned with the politics derived from that juxtaposition especially, the different gender roles and stereotypes that are ascribed to men and women.

The body of this research has focused on three main areas: gender role development, gender bias in school materials, and the effects of gender stereotypes on career choice. The literature review will be presented around these three topics, highlighting previous studies about the impact of gender stereotypes on children. [2]

2.1. Theories of Gender Role Development

Gender role development impacts people's self-concepts and delimits many of the social interactions they confront. In the same way, "*the social life and occupational paths they pursue are heavily prescribed by societal gender-typing.*"[3] Theories of gender typing (also *sex typing*) vary in the power they bestow on biology, culture, or cognition. The

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[2] It is worth noting that although the division between the terms *sex* and *gender* is currently widespread, for the most part of the 20th century scholars of all fields referred to them interchangeably. John Money is credited with being the first one to make such differentiation in the mid 1950s, introducing the distinction between what is determined by biology (sex) and what is socially constructed (gender). However both terms continued to be used indistinguishably until feminist theory appropriated the concept of gender in the 1970s. Some of the theories that I will review were written before the terms started to be used separately.

[3] Albert Bandura and Kay Bussey, "Social cognitive theory of gender development and differentiation," *Psychological Review,* vol. 106, no. 4, 1999, p. 676.

degree in which each factor affects children's gender-typed identities is critical for the study of the influence of gender stereotypes in textbooks. Gender typing is considered the "*acquisition of sex-appropriate preferences, skills, personality attributes, behaviors, and self-concept*"[4].

Sigmund Freud is credited with being the first one to develop a sound theory about sex typing, however most of his arguments have been refuted due to the lack of empirical data conforming to his theories. Nonetheless, psychoanalysis brought the issue of masculinization and feminization as a developmental process (psychosexual development) starting in the child's early years. Freudian theory attributes the ascription to one sex or the other as a result to discovery of own genitalia, and affiliation with the same-sex parent, pointing out at biology (i.e. sex) as the final and sole determinant of a child's sexual identity[5]. Sex typing will derive from fear of castration for male children, and envy of phallus for female children. Biology is, thus, destiny. Differences in children's sexual organs leads to different psychosexual developments, which in turn impact the behavior of adult females and males, and ultimately leads to a differentiation of social and gender roles.

Psychoanalysis cannot explain, then, why children show different degrees of gender-typed behavior when they refer to personal preferences or to the gender appropriateness of others. Studies show that children hold different standards of gender typing depending on the environmental cues. For example, in a study 3-year-old girls

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[4] Sandra Bem, "Gender Schema Theory," p. 598.
[5] Albert Bandura and Kay Bussey, "Social cognitive theory," p. 678.

were only inclined to choose gender-typed toys when they had been previously asked

about the gender association with the toys.[6] Also children are more prone to show

gender-appropriateness stereotypes when selecting toys for others but not when selecting

their own.[7] Anthropological studies also contradict the premise of destiny and thus,

universality, psychoanalysis professes. Dr. Margarte Mead's work on sex and

temperament on primitive societies (exploring the gender roles ascribed in three tribes in

New Guinea) clearly shows how concepts of masculinity and femininity are arbitrarily

but constantly imposed in societies who share the same communal values and norms, and

that such definitions vary from community to community. Her studies even show that

masculinity traits (as industrialized societies define them) can be found in the female sex,

and vice versa.[8]

In the opposite spectrum from Freudian theory, Social-Learning shifted the

emphasis of sex differences to purely learnt social behaviors. Children behave following

a series of role models and are rewarded accordingly. Over time, they continue to repeat

the actions that lead to higher rewards.[9] The biological determinism is, thus, erased but

the link between female and feminine behavior, and male and masculine behavior

remains a premise. The theory presupposes that social expectations of what gender roles

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[6] Lisa A. Serbin, Kimberly K. Powlishta, Judith Gulko, Carol Lynn Martin and Marlaine E. Lockheed, "The Development of Sex Typing in Middle Childhood," *Monographs of the Society for Research in Child Development,* vol. 58, no. 2, 1993, p. 16.
[7] Ibid.
[8] Margaret Mead, *Sex and Temperament in Three Primitive Societies* (New York: William Morrow, 1935), p. 285.
[9] Walter Mischel, "A Social-Learning View of Sex Differences in Behavior" in Eleanor E Maccoby and Roy G D'Andrade, eds., *The Development of Sex Differences* (Stanford: Stanford University Press, 1966), pp. 56-81.

should be lead children's development of sex-typed identities. The child is then regarded

as a mere passive individual, shaped only by social standards and expectations.[10] As

Kohlberg puts it when comparing Social-Learning to Cognitive-Development:

> The social-learning syllogism is: "I want rewards, I am rewarded for doing boy things, therefore I want to be a boy. In contrast, a cognitive theory assumes this sequence: "I am a boy, therefore I want to do boy things, therefore the opportunity to do boy things (and to gain approval for doing them) is rewarding.[11]

Despite bringing forward the importance of a child's environment in the

development of gender identity and sex-typed behaviors, social learning theories fail to

account for sex-typed identities that are not entirely shaped by the child's proximity or

that are not the result of pure imitation. As noted by Bem, social learning theory is also

inconsistent with children holding different degrees of stereotyped beliefs at different

ages. For example, children have shown stricter stereotypical gender attitudes towards

occupations between the ages of 4 and 9, but those stereotypes seem to decrease in the

years right before and after.[12]

Borrowing from Jean Piaget's claim about the primacy of cognition in children's

language acquisition, Cognitive-Developmental theory attributes the development of sex

typing to the child's own cognitive development. As opposed to previous hypotheses,

cognitive theories claim that the child's surroundings are not what motivates

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[10] Ibid. p. 57.

[11] Lawrence Kohlberg, "A Cognitive-Developmental Analysis of Children's Sex-Role Concepts and Attitudes," in Eleanor E Maccoby and Roy G D'Andrade, eds., *The Development of Sex Differences* (Stanford: Stanford University Press, 1966), p. 89.

[12] Sandra Bem, "Gender Schema Theory," p. 600.

development, but instead an innate ability to create representations.[13] In this way, a child's cognition acts like a pre-existing structure that the child will use to make sense of and categorize the external world. These claims are rooted in the observation that children often develop language structures to which they haven't been exposed. Hence, the belief that there's an innate ability to create theoretical categories that will later divide the practical examples coming from the child's environment.

Cognitive-Developmental analysis does not acknowledge the influence that certain external factors might have on the sex-typed attitudes of the children. As a study with 558 children aged 5-12 shows, environmental factors such as the father's presence in the home had an effect on the flexibility and knowledge of stereotypes.[14]

Dr. Sandra Lipsitz Bem introduced Gender Schema Theory as a framework deriving from both cognitive-developmental and social-learning theories. Gender Schema claims that children's sex typing occurs along cognitive development, deriving from a "*gender schematic processing*" that creates an innate disposition on children to analyze the environment searching for gender cues.[15] Children learn and develop sex typing from the meaning of masculinity and femininity embedded in their culture.

Gender schema is a cognitive pre-structure built in the children's developmental process, which creates a predisposition to identify, examine, and understand gender. Bem argues that adults constantly provide gender-stereotyped input and children are able to

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[13] Lawrence Kohlberg, "A Cognitive-Developmental Analysis of Children's Self-Role Concepts," p. 82.
[14] Lisa A. Serbin, Kimberly K. Powlishta, Judith Gulko, Carol Lynn Martin and Marlaine E. Lockheed, "The Development of Sex Typing," p. 19.
[15] Sandra Bem, "Gender Schema Theory," p. 603.

classify it and apply it to the category of sex. For example, when they learn the

stereotypical idea that boys are strong, they simultaneously learn that girls are weak, by

being able to extend attributes and sex-typed traits to either sex. This also leads to the

child's modification of patterns of behavior to conform to social norms.

Critics argue that: " *gender schema theory remains a cognitive theory, in that*

*these social factors are thought to affect sex typing indirectly, through their influence on*

*cognitive processes*."[16]

2.2. Gender Bias in Textbooks

The MINERD published a report in 2010 with data on a national diagnosis carried

out in 4th grade. The study's purpose was to evaluate all 4th graders' skills and

competences, and to gather information about the state of the schools, and the learning

opportunities they offer.[17] In order to render a profile of the Dominican classrooms, the

study details the availability of the required materials for learning in the 4th grade

classrooms. Textbooks were the highest available resource in the instructional materials

category, with an 88.2% of classrooms having textbooks available. From all the other

categories, the only other resource more available than textbooks, were blackboards

(93.3%). Calculators were reported to be available in only 45.9% of the classrooms,

Internet in 20.3%, and classroom libraries in 29%.[18]

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[16] Lisa A. Serbin, Kimberly K. Powlishta, Judith Gulko, Carol Lynn Martin and Marlaine
E. Lockheed, "The Development of Sex Typing," p. 13.
[17] MINERD, *Evaluación Diagnóstica de Inicio Del 4to Grado de La Educación Básica.
Informe de Resultados 2010*, Santo Domingo, 2010.
[18] Ibid., p. 95.

Even though the use of textbooks in Dominican primary classrooms has been reported to account for 13% of instructional time[19], instructional time data shows that only 55% of the classroom total time is dedicated to learning.[20] These data show that textbooks are still overwhelmingly important in the Dominican school context and careful attention should be paid to the quality of the content portrayed in such significant materials. Overall quality in education is affected by several factors: learners (skills and competences), learning environment (physical elements, safety, discipline, etc.), content (non-discriminatory, standard-based curriculum), processes (teacher competence and school efficiency), and outcomes (academic achievement).[21] Of all five dimensions, content is the only one that can be designed and spread to reach every single student in the country. By creating non-discriminatory, gender-sensitive instructional materials that are aligned to a formal curriculum, every child could be exposed to gender-fair materials, regardless of the physical state of their classroom, the teacher's background, or the student's own abilities.

2.2.1. Gender Equitable Materials and Gender Typing

Studies show that children exposed to gender-equitable materials become less sex-typed.[22] In accordance with some of the social learning theory's postulates, children

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[19] MINERD, *Uso Del Tiempo En Las Escuelas de Jornada Ampliada de La República Dominicana*, Santo Domingo, 2013, p. 41.
[20] Ibid., p. 12.
[21] UNICEF, "Defining Quality in Education," A paper presented at the meeting of The International Working Group on Education (Florence, UNICEF publication, 2000).
[22] Kathryn P. Scott and Candance Garrett Schau, "Sex Equity and Sex Bias in Instructional Materials", in Susan S. Klein, ed., *Handbook for Achieving Sex Equity through Education* (Baltimore: The Johns Hopkins University Press, 1985), p. 224.

have been shown to imitate behaviors they are constantly presented with. For example, a study carried out by the National Institute of Mental Health discovered that children who had been exposed to violent TV programming were more prone to exhibit aggressive behavior, incompliance with discipline, and higher levels of impatience.[23]

The same assumption can therefore be made in the field of sex-typing. The further exposure to gender stereotypes and traditional role images children suffer, the more sex-typed they will become. A study carried out about the effect of story characters portraying nontraditional roles on 3rd and 4th graders showed that girls were more likely to believe that females could undertake nontraditional activities (the ones portrayed in the books) after reading the stories.[24] Other studies with 4th, 7th, and 11th graders have yielded the same results.[25] However, it has been widely reported that the decrease in sex-typed attitudes is only related to the activities portrayed in the materials. That is to say, children who have encountered materials portraying nontraditional roles are likely to accept those but continue to hold sex-typed attitudes towards other activities not covered by the materials.[26] This is a salient discovery that proves the need to portray men and women in nontraditional roles as much as possible, since the effects of exposure to some activities will not affect the sex-typed vision children have on others.

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[23] Kathryn P. Scott and Candance Garrett Schau, *Sex Equity and Sex Bias,* p. 224.
[24] Myra Sadker, David Sadker and Susan Klein, "The Issue of Gender in Elementary and Secondary Education," *Review of Research in Education*, vol. 17, 1991, p. 279.
[25] Ibid.
[26] Kathryn P. Scott and Candance Garrett Schau, *Sex Equity and Sex Bias,* p. 221; Myra Sadker, David Sadker and Susan Klein, "The Issue of Gender," p. 279.

2.2.2. Gendered Language in Textbooks and the Problem of Representation

Following the Royal Spanish Academy (*Real Academia Española de la Lengua*):

Masculine is the unmarked gender in Spanish, and feminine is the marked one (...)
Unmarked refers to the member of a binary opposition able to comprise the
opposition in its entirety, rendering the marked term unnecessary. (...) masculine
nouns not only refer to individuals of the male sex, but also to (...) all individuals
in the species, without sex distinction.[27]

Like many other romance languages[28] Spanish grammar is intrinsically gendered.

Unlike Latin and other romance languages, Spanish gender is composed of the binary

masculine/feminine forms, lacking a gender neuter category. Thus, masculine is taken as

the "unmarked" gender. Due to the Economy Principle in language, which establishes

that repetition should be avoided and encourages the reduction of unnecessary syntactic

forms, the use of both masculine and feminine references is rejected.

Many style guides have openly criticized the generalized use of the masculine

form to refer to both genders in Spanish and have advocated for the use of double

references instead.[29] This line of thought encourages breaking the Economy Principle in

order to benefit women's visibility, inclusivity, and gender equality in language.

Different linguistic theories deal with the issue of language and representation,

studying whether language describes or shapes reality. It is commonly agreed today

amongst experts that language is more than just a representation of symbols by which

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[27] Real Academia Española (RAE), *Nueva gramática de la lengua española. Volúmen II:
Sintaxis* (Madrid: Santillana, 2009), p. 85. My translation.
[28] Romance Languages are a branch of the Inodeuropean Language Family. They are
reported to have derived from Vulgar Latin.
[29] Ignacio Bosque, "Sexismo lingüístico y visibilidad de la mujer," Boletín de
Información Lingüística de la RAE, 1 Marzo 2012.

reality is reflected. Instead, language helps us constructs our own form of reality.[30] From

a constructivist perspective, naming the world surrounding us brings that world into

reality. We construct the world through language, which results in differences in the

images different cultures see. The classical example of colors, and how some cultures see

less colors than others (and thus, have less color names in their own language/dialect) is a

powerful argument to support the constructivist claim.[31]

By following grammatical correctness, cultures risk suppressing women

linguistically. Using male generic language pretending to include both sexes distorts

reality because it evokes an image far from the truth: that women aren't present. The

words "*bombero*" (fireman), "*obrero*" (construction worker), "*ingeniero*" (civil engineer)

are all male in Spanish, and the image children recall when they are exposed to them

portrays, inevitably, a man.

The RAE's presumption that the male gender is unmarked and therefore can be

applied to collectives regardless of their gender is intrinsically flawed. The grammatical

male gender is part of the binary construction of gender, which comprises male and

female. Children learn this binary construction before they start to speak or write.[32] When

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[30] Sandra Vazquez Hermosilla, *I bought my son an iPad and my daughter and iPod. The wife got me an iPhone and I got her an iRon. Indirect linguistic sexism in computer-mediated communication: an analysis of Cosmopolitan and Men´s Health´s online forums*, 2013, (Doctoral Dissertation), Retrieved from http://roderic.uv.es/handle/10550/29144.
[31] William G. Roy, *Making Societies: The Historical Construction of Our World* (Boston: Pine Forge Press, 2001), p. 11.
[32] Brian MacWhinney, "Language Development," in Marc H. Bornstein and Michael E. Lamb, eds., *Cognitive development: An Advanced Textbook* (New York: Psychology Press, 2011), p. 426.

preschoolers and first graders are taught literacy skills in Spanish, the dichotomy between the female and the male gender of objects, people, and animals is clearly stated. A cognitive structure of gender is created under which children can learn about new concepts and categorize them according to whether they are male or female. Gender acts like an overgeneralization that will be applied in a case-to-case manner when new information is received through a process of association. Once speakers of a language learn the gender ascribed to one word, they cannot unlearn it.

A study conducted with speakers of Spanish and German about grammatical gender and people's mental representations of objects concluded that, in fact, language shapes thought and that gender isn't a linguistic abstract category. Participants in the study were presented with a series of objects and asked to rate them in terms of their association to a female person or a male person. The study was conducted in English, and the words chosen were random daily objects whose grammatical gender is the opposite in Spanish and German. So for example, the words toaster, moon, and spoon are grammatically female in Spanish and grammatically male in German. Results of the study show that participants associated the English words with a woman or a man according to the grammatical gender of the word in their respective native languages.[33]

Such evidence helps open the issue of whether grammatical correctness should be sacrificed to benefit gender-fair representations and to avoid gender inequality. Sexism in language comes in different shades and colors. Any policy aiming at the elimination of

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[33] Webb Phillips and Lera Boroditsky. "Can Quirks of Grammar Affect the Way You Think? Grammatical Gender and Object Concepts," *Proceedings of the 25th Annual Meeting of the Cognitive Science Society*, 2003, p. 928–33.

sexism in the language of textbooks should take into account the unfairness

representation that masculine names of occupations bring about.

### 2.2.3. The Hidden Curriculum

The hidden curriculum refers to "those unstated norms, values, and beliefs

transmitted to students through the underlying structure of schooling"[34]. Formal

curriculum reforms are often times carried out in hopes of fixing pervasive educational

shortcomings. However, such reforms rarely target the hidden curriculum. Gender

stereotypes, sex-typed behaviors, or unequal attitudes towards females and males are part

of the hidden curriculum, making their identification and elimination yet harder.

Stromquist argues that while countries focus on equal access, many forget about the fact

that "*gendered knowledge is acquired via the formal and the hidden curriculum*"[35]

Attempts to improve the representation of females in school materials might be

successful in taking measures such as raising the ratio of female to male characters.

However, revisions of the role played by the characters in the textbooks, the grammatical

gender of occupations, the physical appearance of boys/girls or men/women, or their

emotional traits are often times overlooked in curriculum reforms. This may be due to the

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[34] Henry A. Giroux, "Developing Educational Programs: Overcoming the Hidden Curriculum," *The Clearing House,* vol. 52, no. 4, 1978, p. 148.
[35] Nelly P. Stromquist, "What Poverty Does to Girls' Education: The Intersection of Class, Gender and Policy in Latin America," *Compare: A Journal of Comparative and International Education*, vol. 31, no. 1, 2001, p. 46.

fact that such stereotypes are in fact a reflection of the "*gender stratification*" of the society in which the books are created.[36]

Finally, there is some criticism as to the extent to which the curriculum and the portrayal of gender roles in textbooks should be modified to become more sex-fair. Lovelace and Kignston, in their review of the literature about sexism in textbooks, raise the question of whether "*Should a writer try to portray life realistically or should he portray an ideal if unreal world? In literature, the "ideal" often makes for saccharine reading.*"

Curriculum content can, certainly, be a difficult topic to address. On the one hand, the argument made by Lovelace and Kingston feeds from the importance of creating locally appropriate school materials that can help children identify with their social environment, instead of alienating them. On the other hand, there are those who claim that curriculum development should strive to "protect" children:

> The development of guidelines for curriculum content and assessment is a challenging task (...) it must be culturally salient and locally relevant and meaningful in the context of a specific community. (...) Most often, curriculum decisions are abdicated to commercial textbook publishers, distributors of packaged curricula, and developers of standardized tests. These practices have been disastrous for children and can no longer go unchallenged. When policies and practices are necessary to "protect" children from school and when kindergarten and first grade are routinely described as "aversive environments," something is seriously wrong with the curriculum.[37]

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[36] Rae Lesser Blumberg, "Gender bias in textbooks: a hidden obstacle on the road to equality in education," Background paper prepared for *UNESCO's Global Monitoring Report 2008: Education for All by 2015. Will We Make It,"* 2007, p. 33.

[37] National Association for the Education of Young Children and National Association of Early Childhood Specialists, *Guidelines for Appropriate Curriculum Content and Assessment in Programs Serving Children Ages 3 Through 8*, 1990.

These opposing views on curriculum development elicit an important question: should textbooks be more faithful to local realities or to social ideals? It should be noted that gender equality is not a utopian notion, since it is drafted in many legal biding documents around the world, as part of constitutions, national agendas, or global goals. So maybe the real question is whether textbooks should continue to reflect a reality that helps maintain a traditional status quo or take affirmative action.

Finally, when addressing the topic of changes in curriculum and the pace and extent they should take in the elimination of sexism, looking at previous educational reforms might prove helpful. The following quote belongs to an American 19th century primary textbook:

> God is the creative process: He first made the black man, realized He had done badly, and then created successively lighter races, improving as He went along. To the white man He gave a box of books and papers, to the black a box of tools so that he could "work for the white and red man, which he continues to do".[38]

In the same way the school system became paramount in the "institutionalization" of racism even when laws have been passed against school segregation[39], gender inequality might be perpetuated by implicit sexism in the curriculum.

2.3. Gender Stereotypes and Career Choice

In 2005 during an economics conference at Harvard University, the then President of the institution, Lawrence Summers, listed the three main reasons for female

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[38] Ruth Miller Elson, *Guardians of tradition, American schoolbooks of the nineteenth century* (Nebraska: University of Nebraska Press, 1964, p. 88, as seen in Carl A. Grant, *Multiculturalism in Education and Teaching: The Selected Works of Carl A. Grant* (New York: Routledge, 2015), p. 8.
[39] Ibid, p. 7.

underrepresentation in the fields of science and engineering. The main one was related to the time commitment careers in these fields require; the second one had to do with variability between female and male population of their overall IQ; and the last one with gender bias in the fields aforementioned.[40]

However right or wrong Mr. Lawrence might have been, or better said, whether one agrees or not with his remarks, these three hypotheses for the gender gap in Science, Technology, Engineering, and Mathematics (STEM) careers are often discussed. Here follows a literature review addressing some of the evidence to support or reject these arguments.

### 2.3.1. Gender Differences in Math and Science Performance

It is widely believed that boys score higher in math and science tests, while girls outperform boys in reading skills. The latest Programme for International Student Assessment (PISA) report about Gender Equality in Education shows data from 64 countries supporting this claim.[41] However, it is crucial to understand how and why test scores show this variance. Is it innate abilities and differences in IQ or are these differences the result of gender bias? There is an overwhelming amount of literature pointing to the latter.[42]

[40] Lawrence H. Summers, "Remarks at NBER Conference on Diversifying the Science and Engineering Workforce, January 2005." *Transcript retrieved from http://www.harvard.edu/president/speeches/summers_2005/nber.php*
[41] OECD, *The ABC of Gender Equality in Education: Aptitude, Behaviour, Confidence (Paris:* OECD Publishing, 2015a).
[42] Ibid.; Janet S. Hyde, Sara M. Lindberg, Marcia C. Linn, Amy B. Ellis, and Caroline C. Williams, "Gender Similarities Characterize Math Performance," *Science*, vol. 321, no. 5888, 2008, pp. 494-495; Ernesto Reuben, Paola Sapienza, and Luigi Zingales, "How

The PISA report, indeed, points out at the lack of girls' self-confidence as the major cause for the disparities in science and math performance.

> This gender difference in the ability to think like a scientist may be related to students' self-confidence. When students are more self-confident, they give themselves the freedom to fail, to engage in the trial-and-error processes that are fundamental to acquiring knowledge in mathematics and science.[43]

The report establishes that "*self-efficacy (students' beliefs that they can successfully perform given mathematics and science tasks at designated levels) is associated with a difference of 49 score points in mathematics and 37 score points in science*"[44]. Other studies also point at beliefs about competence (self-assessment) to be the cause of girls' and women's lower enrollment rates in quantitative-based subjects and careers.[45] Female and male students with the same mathematical ability were asked to evaluate their competence, with a result of males estimating their performance 0.25 points higher than females. When the variable for self-assessment was controlled, no

stereotypes impair women's careers in science," *Proceedings of the National Academy of Sciences*, vol. 111, no. 12, 2014, pp. 4403-4408; Jocelyn Steinke, "A Portrait of a Woman as a Scientist: Breaking down Barriers Created by Gender-Role Stereotypes," *Public Understanding of Science*, vol. 6, no. 4, 1997, pp. 409-28; Nelly. P. Stromquist, "Determinants of Educational Participation and Achievement of Women in the Third World: A Review of the Evidence and a Theoretical Critique," *Review of Educational Research, vol.* 59, no. 2, 1989, pp. 143-83; Shelley J. Correll, "Gender and the Career Choice Process: The Role of Biased Self-  Assessments," *American Journal of Sociology*, vol. 106, no. 6, 2001, pp. 1691–1730; Catherine Hill, Christianne Corbett, and Andresse St. Rose, *Why so few? Women in Science, Technology, Engineering, and Mathematics* (Washington: American Association of University Women, 2010).
[43] OECD, "What lies behind gender inequality in education?" *PISA In Focus,* no. 49, (Paris: OECD Publishing, 2015b), p. 3.
[44] OECD, 2015a, p. 64.
[45] Shelley J. Correll, 2001, p. 1695.

gender distinction is found in math class enrollment, and the gender gap in quantitative careers decreases.[46]

Studies carried out about test performance gap across races show that "stereotype threat" (fear among members of a group of reinforcing negative stereotypes about the intellectual ability of the group) has a negative impact on test performance.[47] Along these lines, it would be interesting to research the effect of the concept of "self-hatred" (often times linked to race or linguistics) in the case of females in hard science. Could low self-assessment and stereotype threat lead to girls' underperformance in math and science? Much like speakers in diaglossic regions[48] who engage in code switching in order to avoid identification or adherence to the low-prestige language[49], girls could be avoiding to pursue careers in science due to a negative perception based on gender bias.[50]

Differences in visual-spatial ability have been reported to account for differences in male and female performance in the fields of math and science.[51] However, differences

[46] Ibid, p.1721.

[47] Joshua Aronson, Geoffrey Cohen, and Wendy McColskey, "Reducing Stereotype Threat in Classrooms: A Review of Social-Psychological Intervention Studies on Improving the Achievement of Black Students. Issues & Answers," *Regional Educational Laboratory Southeast*, no. 076, 2009.

[48] Regions where two languages are spoken and one is usually considered the prestigious variety.

[49] Rafael L. Ninyoles, *Cuatro idiomas para un estado: (El castellano y los conflictos lingüísticos en la España periférica)* (Madrid: Editorial Cambio 16, 1977).

[50] William Labov carried out an interesting study of social conditioning in his work about the social stratification of the letter (r) in New York City Department Stores. Labov's analysis shows that, the clerks working at lower-prestige stores and who belonged to lower social strata showed a distinctive phonetical pattern of the letter "r". However, when they were asked to repeat information containing the phoneme, they aimed at correcting their pronunciation by using the variation considered more appropriate.

[51] Catherine Hill, Christianne Corbett, and Andresse St. Rose, *Why so few?*, p. 52.

in visual-spatial abilities in favor of males are not evident until the early teen years.[52]

This leads to the hypothesis that the development of such abilities might be related to a

process of socialization of different games and practices (for example, construction toys

such as *legos*) in boys and girls. Interestingly enough, spatial cognition has been shown to

improve with practice, closing the gender gap, with females significantly improving their

skills, and males reaching a plateau after acquiring a certain degree of dexterity.[53]

All the evidence presented here indicates that, albeit a higher male performance in

math and science tasks, differences in performance have little to do with innate abilities

and, at the very least, generalizations to the contrary should be avoided due to the great

variance found across time, geographical region, sociocultural status, or between

individuals of the same gender.

### 2.3.2. The High-Powered Job Hypothesis

Careers in STEM arguably require a bigger time commitment and are more

demanding than careers in other areas. This is often times listed as one of the main

reasons why fewer females are found in these careers. Evidence shows that women are

more likely to list family-derived responsibilities when dropping out of these fields.[54]

Stromquist claims that patriarchal societies inculcate the value of family and domestic

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[52] Margaret Mooney Marin, "Sex and Gender: What Do We Know?" *Sociological Forum*, vol. 5, no. 1, 1990, p. 101.
[53] Ibid, p. 53.
[54] Catherine Hill, Christianne Corbett, and Andresse St. Rose, *Why so few?*, p. 26.

responsibilities on girls, thus channeling their choice of career towards less-demanding activities.[55]

In a study about career aspirations and career expectations for high-achieving female and male high school students, Purvis discovered that high-achieving females listed "domestic responsibilities" more times than any other category when asked about their expectations at age 25-30. On the other hand, none of the high-achieving males listed "domestic responsibilities" as an expectation for the same age range.[56]

In the Dominican Republic, data shows that 28% of the women between 5 and 34 years of age that did not attend school during the academic year 2012-2013 listed "domestic responsibilities" as the main reason. Only 0.8% of men in the same age range were reported to have this problem.[57]

Employed married women have been reported to spend almost three times longer on domestic responsibilities than their husbands.[58] Also, women in STEM who have a partner in the same field are more likely to prioritize their male partner's career in order to attend to family commitments.[59]

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[55] Nelly. P. Stromquist, "Determinants of Educational Participation and Achievement of Women in the Third World," p. 172.

[56] Carillon Ruth Cameron Purvis, "The Effect of Gender-Role Stereotyping on the Career Aspirations and Expectations of Pre-Adolescent Children of High Intellectual Ability," PhD Dissertation, University of Lethbridge, Faculty of Education, 1987, p. 76.

[57] Centro de Estudios Sociales y Demograficos (CESDEM), "Encuesta Demográfica y de Salud," 2013, p. 33.

[58] Margaret Mooney Marin, "Sex and Gender," p. 108.

[59] Catherine Hill, Christianne Corbett, and Andresse St. Rose, *Why so few?*, p. 24.

### 2.3.3. Gender Bias in STEM

Fewer women choose to enroll in careers in the fields of science, technology, or engineering. Academic skills and confidence in future performance play a role in shaping young students' path in tertiary education. Identification with a professional career also plays a major role when high school students are considering their career choice. If young girls cannot see themselves developing an activity, chances are they will not pursue it as a viable professional path. However, what might look as a simple personal preference, unrelated to discrimination or bias, can be just that. In order for girls to identify with a career, powerful and abundant female role models are necessary. The idea of "possibility" has to exist so girls can imagine a future projection of what their roles and lives will be like. The lack of real role models (due to the small numbers of females in these roles) or fictional role models (due to the absence of female in non-traditional roles portrayed in school materials) make it very difficult for girls to be able to imagine themselves carrying out those tasks and activities.

Apart from the intrinsic limitations girls might be subject to due to lack of female representation in those fields, there is the external bias (however subtle) from teachers and schools. Several studies have reported the changes in teachers' attitudes towards girls' and boys' in a school environment. These behaviors and beliefs (which form part of what it's been described as the hidden curriculum) help shape and orient children's preferences.

Teachers have been reported to spend more time with male preschoolers than female, to

engage more frequently in conversation, and to interact more with them.[60]

The Education For All (EFA) report of 2003, established that:

Full gender equality in education would imply that girls and boys are
offered the same chances to go to school and that they enjoy teaching methods
and curricula free of stereotypes, and academic orientation and counselling
unaffected by gender bias. (...) These objectives are demanding, and are far from
being achieved in most societies.

Teachers' varying expectations for boys and girls' performance according to the

subject help perpetuate negative gender roles and hinder learning. They also influence the

activities students will be required to complete or the games they will be encouraged to

play. For example, the development of visual-spatial abilities has been reported to result

from playing with construction-type toys, which are typically relegated to boys.[61]

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[60] Myra Sadker, David Sadker and Susan Klein, "The Issue of Gender," p. 296.
[61] Richard A Couch, "Gender Equity & Visual Literacy. Schools Can Help Change
Perceptions," Imagery and Visual Literacy: Selected Readings from the Annual
Conference of the International Visual Literacy, The Educational Resources Information
Center (ERIC), 1994, p. 106.

# 3. GENDER SEGREGATION IN EDUCATION: THE DOMINICAN REPUBLIC

Traditional gender norms in the Dominican Republic are deeply rooted in the social psyche and gender segregation pervades many levels of social interaction. There are substantial and important gender inequalities between Dominican men and women in terms of labor force participation, earned income, or political power. In terms of educational attainment, however, Dominican girls and young women seem to be in the lead, with larger numbers of girls graduating from secondary school, higher female primary school retention rates, lower repetition rates, and higher participation in tertiary education institutions. Dominican female students are, in general, better and more educated than their male counterparts. Nevertheless, following the Gender Data from the Dominican National Office for Statistics (ONE) for 2010, female unemployment almost doubles male unemployment, a gender wage gap exists against women, and there is little female presence in key sectors of the economy such as politics or top-level management. This chapter reviews the numbers in education to point out that, although the Dominican education system seems to be adequate in terms of quantity, a closer look at quality shows a large gender gap and persistence of gender inequality.

## 3.1. Education in Numbers

Following the latest Demographic and Health Survey (*ENDESA*, 2013) the gender ratio of primary education in the Dominican Republic is 0.95, shifting to 1.18 in secondary school. Data from the last Report of Higher Education Statistics (*Informe General Sobre Estadísticas de Educación Superior*) shows that, for the last academic year where data is available (2012), 61.15% of the total enrollment was female and only

38.60% male.[62] Female completion rates for both primary and secondary education are also higher, with 80.4% and 56.7% respectively, as opposed to the 70.6% and 40% for male completion rates for those same levels in 2012-2013[63]. Regarding the average level of education, females have 10.4 mean years of schooling whereas males have 8.7. Literacy rates are also slightly higher among women, with 93% of females being literate and 90.5% of males. Schoolgirls also tend to score higher than schoolboys in both national and international tests. 85.93% of female 8th graders passed the National Tests (*Pruebas Nacionales*) in 2014, compared to 76.88% of the male 8th graders who took the test and past.[64] In comparison, girls also scored higher in all four subject-areas.[65] Finally, data shows that 25.4 of Dominican women aged 15-49 have entered tertiary education, almost 10 points higher than the percentage for males (15.5%).[66]

By looking at these numbers it could be assumed that the Dominican Republic is in the pathway to success in gender equality. However, does the gender disparity in favor of girls in education translate into better access to the labor market, presence in high-power careers, more political participation, or higher salaries? Data shows otherwise. Women face clear disadvantages in the Dominican labor market. Women in rural areas or

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[62] MESCyT, *Informe General Sobre Estadísticas de Educación Superior 2012* y Resumen Histórico 2005-2012 (Santo Domingo: Imprenta Alfa y Omega), p. 23.

[63] MINERD, "Anuario de Indicadores Educativos. Año Lectivo 2012-2013," p. 21.

[64] *Pruebas Nacionales* are standardized tests given annually to all 8th and 12th graders in the four main subjects: Spanish, Social Studies, Science, and Math. They are mandatory exams in order to pass to the next academic year or to continue to tertiary education. A new policy implemented recently has also included 4th graders, who took the tests for the first time in June 2015.

[65] MINERD, "Anuario de Indicadores".

[66] Centro de Estudios Sociales y Demograficos (CESDEM), "Encuesta Demográfica y de Salud," 2013.

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in the poorest quintiles of the national income face even greater disadvantages. While

48.1% of the female population between the ages of 15-49 are employed, a closer look to

the type of employment, the salary earned, or the job instability yields a clearer picture of

the arduous task women face when entering the labor market.[67] Finally, when women do

enter the job market most agglutinate around "female" careers that evolve from their role

as mothers and housewives. Following the conclusion remarks found in ENDESA 2013

on women empowerment and occupations:

> Historically, women have entered a segregated labor market, gathering around
> those jobs at the bottom rung of the occupational ladder and, therefore, the most
> unprotected even by the labor laws. Furthermore, in their incorporation to the
> labor market women start to develop jobs closely linked to the societal role
> assigned to them as family caregivers (...) almost half of the female workforce
> (48%) is devoted to domestic work, sales, and services. Another high percentage
> works as professional workers, technicians, and managers (22%), and 15% as
> office workers. However, if the data could be segregated internally by occupation,
> probably the last two groups would show that the majority of females in those
> groups are working as teachers, nurses, secretaries, receptionists, cashiers, and
> other similar occupations, which are jobs traditionally carried out by women.[68]

The same pattern is true for university trends. Young Dominican women

overcrowd traditional female careers, and barely enroll in the fields of hard science of

Information Technology. Another salient data point is the low rate of female political

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[67] CEPAL, "Informe de La República Dominicana sobre la aplicación de la Declaración y Plataforma de Acción de Beijing (1995) y los Resultados del vigésimo tercer período extraordinario de sesiones de la Asamblea General (2000)," 20º aniversario de la Cuarta Conferencia Mundial sobre la Mujer y la aprobación de la Declaración y Plataforma de Acción de Beijing 2015, 2014, p. 49.

[68] Centro de Estudios Sociales y Demograficos (CESDEM), "Encuesta Demográfica y de Salud 2013," p. 299. My translation.

participation in the country. In 2010, women held 20.8% of the congressional seats, 9.4% of the senate seats, and only 7.7% of mayoral jobs.

3.2. Dominican College Trends: Feminization of Tertiary Education

Since the early 1990s Dominican women have been overpopulating universities and colleges. Female participation rates have gone from 47.9% in 1987[69] to 61.15% in 2012[70]. However, females are almost invisible in traditional "male" careers, such as civil engineering, computer science, politics, or agronomy. Dominican young women tend to agglutinate around careers that are very much linked to traditional female roles, such as nurturing, educating, or child rearing. Collegial trends and career choice amongst Dominican female and male students show a strong connection to occupational gender stereotypes, leading into a highly gender-segregated labor market.

In 2011, women accounted for the 93.74% of students enrolled in Elementary Teacher Education programs, 94.09% in Nursing, 81.02% in Social Communication, and 81.53% of the students enrolled in Psychology.[71] On the other hand, 5.44% of enrolled students in Mechanic Engineering, 28.68% in Civil Engineering, and 19.98% of Systems Engineering were female.

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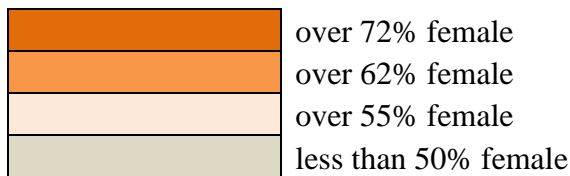[69] Lucero Quiroga, *Feminizacion de La Matricula Universitaria En La Republica Dominicana 1977-2002* (Santo Domingo: Centro de Estudios de Género INTEC, 2003), p. 16.
[70] The last report with official data for tertiary education enrollment rates corresponds to the year 2012.
[71] MESCyT, *Informe General Sobre Estadísticas de Educación Superior 2010-2011* (República Dominicana: Innova Technology S.A.), p. 130.

**Figure 1 Female Enrollment in the 15 careers with Highest Matriculation 2005-2011 (as percentage of total net enrollment)**

| Female | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 |
|---|---|---|---|---|---|---|
| **Accounting** | 69.44 | 70.69 | 71.75 | 70.96 | 70.61 | 69.61 |
| **Medicine** | 71.44 | 70.69 | 69.01 | 70.02 | 68.88 | 69.00 |
| **Psychology** | 79.56 | 81.53 | 89.20 | 89.12 | 89.06 | 88.55 |
| **Law** | 60.56 | 61.08 | 58.02 | 57.81 | 57.99 | 56.95 |
| **Business Administration** | 63.51 | 64.26 | 62.56 | 63.26 | 63.99 | 63.12 |
| **Marketing** | 63.11 | 65.24 | 66.84 | 66.80 | 66.76 | 65.56 |
| **Civil Engineering** | 28.68 | 28.76 | 29.92 | 27.72 | 25.81 | 26.16 |
| **Computer Science** | 29.78 | 30.34 | 40.75 | 39.52 | 39.23 | 39.28 |
| **Tourism** | 72.39 | 75.93 | 77.49 | 77.77 | 76.86 | 75.25 |
| **Industrial Engineering** | 37.28 | 36.64 | 37.79 | 36.02 | 31.79 | 31.49 |
| **Elementary Education** | 83.03 | 82.71 | 86.96 | 87.10 | 86.89 | 86.57 |
| **Early Childhood Education** | 93.55 | 93.74 | 97.42 | 97.72 | 98.67 | 98.79 |
| **Architecture** | 56.76 | 56.39 | 57.73 | 56.94 | 57.05 | 55.59 |
| **Social Communication** | 81.06 | 81.02 | 79.33 | 79.37 | 78.44 | 76.43 |
| **Bio-analysis** | 93.84 | 94.35 | | | | 95.07 |
| **System Engineer** | | | 47.24 | 45.03 | 35.39 | |

| | |
|---|---|
| ⬛ | over 72% female |
| ⬛ | over 62% female |
| ⬛ | over 55% female |
| ⬛ | less than 50% female |

Matriculation in 12 out of the 15 careers with the highest enrollment from 2005 to 2011 was pre-eminently female. The only three careers with higher male ratio were Civil

Engineering, Computer Science, and Industrial Engineering. From 2007 to 2009 Systems

Engineering was one of the top 15 careers and also received a male majority. The rest of

the years, Bio-analysis (notably female) took its place in the ranking. The highest gender

gap in these 15 careers was found in Early Childhood Education, Bio-analysis,

Elementary Education, and Psychology. Law and Architecture seem to be the only

options were, despite a slight female majority, enrollment rates tend to parity between

both genders. Nonetheless, college trends show a large gender disproportion in almost all

15 careers, with a gender gap affecting both male and female students.

     Female-dominated careers belong to the fields of Health (Medicine, Bio-analysis),

Education (Early Childhood Education, Elementary Education), Humanities (Psychology,

Social Communication), and Social Science (Marketing, Tourism, Business

Administration, Accounting).

     The net enrollment rate in the Dominican Republic has increased from 322,311

students in 2005 to 445,909 in 2012.[72] Both female and male college populations have

been growing, however the male rate of annual enrollment growth has been a little higher

(5.55%) than the female rate (5.06%). Nonetheless, the process of feminization of the

tertiary education continues. Female enrollment has increased in the last few years in

traditional male careers such as Business Administration and Medicine. However, women

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[72] MESCyT, *Informe General Sobre Estadísticas de Educación Superior 2012*, p. 22.

still remain highly underrepresented in academic sectors that are key for the new economic models, such as Information Technology or Engineering.[73]

In order to better assess whether the environment shapes Dominican female students' tendency to drift away from these academic fields, a quick look at girls' performance in primary and secondary education might prove useful. Hill et al. point out at the fact that girls' achievement in math and science decreases as they enter the teen years due to unfavorable environment towards female in such subjects.[74] Dominican primary school girls tend to score slightly higher than boys during National Tests (*Pruebas Nacionales*) in both mathematics and science, however by the time they reach 12th grade the results of the tests for both subjects show larger differences in detriment of girls. Table 1 at the end of this thesis shows the results of the National Tests[75] for the last three years for which data is available.

The difference between female and male performances drastically increases in the years from 8th to 12th grades. While at the end of middle school all students score very similarly in national tests, by the time they graduate from high school a gap has been created between females and males in both modalities. This gap intensifies in the technical program, reaching a difference of 0.86 in the national results for math in 2014. This can be the result of gender association of STEM careers with males, which leads girls to pursue college degrees that are related to social science, humanities, and health.

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[73] Amparo Arango Echeverri, Magaly Pineda, Valery Vega, and Margarita Cordero, *La Brecha Digital de Genero En La Republica Dominicana: ¿otro Techo de Cristal?* (Santo Domingo: Centro de Investigación para la Acción Femenina (CIPAF), 2011), p. 29.
[74] Catherine Hill, Christianne Corbett, and Andresse St. Rose, *Why so few?*, p. 27.
[75] It should be noted that National Tests scoring system is 0-30.

## 4. RESEARCH METHODS

My initial hypothesis was whether gender-biased depictions of occupations persisted in Dominican primary school textbooks and, if they did, could they limit children's future career choices by alienating them from jobs traditionally related to the opposite sex. It is important to note that gender-bias affects both girls and boys, and my research is concerned with how these stereotypes limit all children's choices. Yet, girls tend to suffer more from gender bias since, as my results will show, they lack more role models in their textbooks to identify with. Furthermore, females are portrayed in far fewer roles than males. My hypothesis is that these stereotypical images impact the roles children assume they can or can't play later in life.

In order to study the existence and intensity of sexism in school textbooks I first analyzed the graphic depictions in 10 primary school textbooks, the names of occupations, and the female to male ratio in pictures and text. I then conducted a study among primary school children to assess whether they would identify with jobs traditionally linked to the opposite sex if both the language and the pictures depicted women and men, thus, erasing the gender bias.

### 4.1. Gender Stereotypes in Dominican Primary Schools

### 4.1.1. Case Selection

As explained in the introduction section of this paper, I chose the Dominican Republic because, in my experience in education in the country, I observed pervasive gender segregation both in the job market and the education system. The Dominican

Republic stands as an ideal case to study the existence of sexism in textbooks since, albeit the feminization of higher education and the large participation of women in the economy, gender inequalities persist at many levels.

Since the Dominican Republic has adhered to several international and national policies and treaties that advocate for the elimination of sexism, it provides a perfect example of ubiquitous forms of sexism in education. Finally, the levels of feminization of the tertiary education and the agglutination of women around traditional female careers make this case a clear illustration of the unreliability of gender parity indicators when evaluating gender equality policies.

4.1.1.1. Textbooks analysis

To study the existence of sexism in primary textbooks I selected a sample of 10 textbooks. They came from a pool of books with the following features: primary school textbooks (from 1st to 5th grade); textbooks from all four main subjects (Social Studies, Spanish, Science, and Mathematics); textbooks created and provided and published by the Ministry of Education (free of cost), and textbooks created and sold by 3 of the main textbook publishers of the country (*Santiallana*, *Susaeta*, and *SM*).

All textbooks are currently being used, and even though the percentage of schools using each of them is impossible to assess, they come from the pool of published books that follows the official school curriculum designed by the Ministry of Education. All of the textbooks have undergone a process of evaluation by the Ministry of Education to assure the quality of the content and the alignment to the formal curriculum and guidelines. For the purpose of this analysis, I will not segregate the data by publisher

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given that all textbooks are used indistinctly and different publications coexist in primary schools.

The final selection consists of three Social Studies textbooks (1st, 2nd, and 3rd grades); three Science textbooks (one from 3rd grade and two from 5th grade); two Mathematics textbooks (3rd and 5th grades); and two Spanish textbooks (3rd and 4th grades).

The tool for textbook analysis I chose was based on UNESCO's simplified sexist stereotype checklist. The analysis gathers quantitative data at three levels: the number of male and female references (illustrations and text); the number of male and female occupational activities (illustrations); the number of male and female occupations (text). The language of the books was not analyzed, expect for the names of occupations and the references to males and females.

4.1.1.2. Experiment with Primary School Children

For the survey conducted with school children to analyze the impact of gender-biased depiction of occupations I first created a list of 20 occupations: 10 traditional male occupations and 10 traditional female occupations. The selection of occupations was taken from jobs depicted in the textbooks (especially in Social Studies textbooks under the chapters dealing with the labor market in the Dominican Republic). In order to analyze whether gender-stereotyped depiction of occupations can have an effect on children's identification with the activities, two versions of the list were created. The first survey (gender-biased) listed the names of the occupations either in feminine or masculine form (depending on the traditional gender stereotype ascribed to the job). The

second survey (gender neutral) listed both the feminine and the masculine forms. Traditional female and male occupations were listed intermittently and in the same order in both surveys.

Before the survey was administered pictures portraying people carrying out the jobs listed in the surveys were shown to the children, and a brief job description was provided (typically one or two sentences). For the control group (gender-biased survey), pictures of only one person were shown. The gender of the person was consistent with the traditional gender bias in the occupation. The job description was also done using gendered language consistent with traditional gender bias. For the study group (gender-neutral survey), pictures of both male and female workers were shown at the same time and gender-neutral terms or double-references (in masculine and feminine) were used in the brief job description.[76]

The gender-neutral survey was given to 27 children (16 boys and 11 girls) and the gender-biased survey was given to 28 children (9 girls and 19 boys). All children involved in the study were between 8 and 10 years of age. They all came from public schools, and low socioeconomic background.

In order to avoid conditioning the children, the issue of gender was forgone throughout the study. All children were told that the activity was to assess what jobs they might be more interested in. They were told that the pictures and job descriptions were

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[76] The pictures chosen for this activity were carefully selected in order to match all possible variables except for the person's gender. The size of the picture, the colors of the background, the position of the male or female, and the race of the person portrayed were the same in the two pictures being shown at a time. The only difference was the gender of the person.

given to make sure they all understood the job titles they would be asked about later. I didn't limit their responses in terms of number of preferences, but participants were told that at least they had to list one job that they liked or one that they disliked. It was also made clear in the instructions that they had to rate all 20 jobs in the list.

My study's focus was not on children's idea of gender-appropriateness but whether gender-specific materials prevent children from the opposite gender from identifying with the task. In order to do this, the survey targeted children's own preferences. For this purpose I dismissed surveys inquiring children to associate job-specific pictures or objects to the categories of male or female. Other survey options I contemplated were based on the idea of showing children pictures of people carrying out non-traditional jobs, thus exposing them to what Shau and Scott call "self-affirmative"[77] materials. However, since my research is mainly concerned with later career choice I was more interested in looking at the changes in children's personal identification when they were not aware that gender was the issue of research.

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[77] Kathryn P. Scott and Candance Garrett Schau, *Sex Equity and Sex Bias,* p. 219.

# 5. RESULTS AND DISCUSSION

## 5.1. Sexism in Textbooks

      My initial hypothesis for this part of the study was that Dominican primary school textbooks depict gender-stereotyped occupational roles. Due to persistent sexism and the fact that Dominican women are greatly connected to the domestic sphere while men are dominant in public spheres such as the labor market and politics, I anticipated a higher ratio of male images and male references in the textbooks. In terms of occupations I expected greater diversity and quantity in male occupations than female occupations.

      Following UNESCO's guidelines, in order to assess whether school materials are gender-biased or gender-neutral a male to female ratio close to 50/50 should be expected in the depiction of images and the references in text. Since half the population of the Dominican Republic is female, both genders should be represented equally.[78] In terms of gender-stereotyped occupations, images illustrating both women and men in non-conventional activities should also account for half of the graphics related to occupations, and both genders should be equally portrayed in roughly the same number of occupations.

### 5.1.1. Results of the Number of Female and Male References in Text and Illustrations

      My analysis of 10 Dominican primary textbooks show a larger portion of images relating to male characters (boys and men) both in text references and illustrations. The

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[78] Andrée Michel, *Down with stereotypes! Eliminating sexism from children's literature and school textbooks* (Vendôme :Imprimerie des Presses Universitaires de France, UNESCO,1986), p.18; Kathryn P. Scott and Candance Garrett Schau, *Sex Equity and Sex Bias,* p. 220.

results show a tendency to underrepresent adult females. The ratio of girls to boys in pictures and text references is closer to 1, albeit a male advantage. Out of the 1,899 illustrations examined in the books, 1,062 depicted a boy or a man, and 837 a girl or a woman. A closer look at the data segregated by girls and boys, and women and men, shows a large difference in representation as the illustrations portray older characters.

The ratio of girls to boys in pictures is 0.85:1, and decreases to 0.69:1 in women to men. It is interesting to note that even when some of the textbooks show a higher female to male ratio in either text or illustration when comparing boys and girls, all ratios are negative for females when comparing men to women, except for 4th grade Spanish SM, which shows a 1.3:1 women to men ratio in illustrations. However, the textbook is consistent in the gender treatment of the textual part, and shows a women-to-men ratio of 0.48:1 in text references.

The following table shows the total results and ratios:

**Figure 2 Comparative Analysis of the Number of Male and Female References in Textbooks (Text and Illustrations)**

|  |  | Women & Girls | Men & Boys | Female to male ratio |
|---|---|---|---|---|
| Number of girls/boys | text | 225 | 238 | 0.95:1 |
|  | illustrations | 572 | 676 | 0.85:1 |
| Number of women/men | text | 163 | 337 | 0.48:1 |
|  | illustrations | 265 | 386 | 0.69:1 |

### 5.1.2. Results of the Number of Male and Female Occupational Activities in Illustrations

The graphic portrayal of occupations also shows a higher male frequency. Out of the 265 pictures showing occupational activities reviewed, 67.2% portrayed male figures and 32.8% female figures. Only 3rd grade Spanish from *Santillana* showed a larger percentage of female portrayals in occupations, with 59.1% of the total illustrated occupational activities depicting women at work. However, 10 out of the total 13 representations found in that textbook showed women as teachers.

The decreased degree of occupational diversity seems to be a pattern in all textbooks. For example, the 5th grade Mathematics textbook from *Santillana* only depicts 13.3% of the total illustrations as female, and all female illustrations correspond to teachers. In the 1st grade Social Studies textbook from *Santillana*, 9 out of the total 23 depictions of female occupations portray teachers as well.

### 5.1.3. Results of the Number of Male and Female Occupational Activities in Text

Finally, my textbook analysis examined the quantity and variety of occupational activities men and women were said to carry out. The data shows evidence of higher frequency of masculine occupational activities being referred to in the textbooks, and also of a wider variety of occupations for men than for women.

Occupations were mentioned a total of 288 times, and 206 of them referred to occupations carried by men. 71.53% of the total of occupational activities were described as male activities, and only 28.47% were assigned to females. In terms of the different careers men and women are said to perform, 100 different job categories were found for men, and only 37 for women. The following table shows this data:

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**Figure 3 Comparative Analysis of Male and Female Occupational Activities in Text**

|  | Female | Male |
|---|---|---|
| Number of times occupational activities are mentioned | 82 | 206 |
| Number of different occupational activities | 37 | 100 |

In terms of the variety of occupational activities, men are listed in a wide range of occupations, such as: mayor, senator, governor, President, councilman, biologist, meteorologist, paleontologist, astronomer, physicist, plumber, carpenter, driver, farmer or inventor (a list with all the occupational activities for females and males is provided in Tables 3 & 4). Strikingly, 29 times of the 82 that women are said to perform an occupation the text refers to female teachers. This proves a substantial bias towards the teaching career and females.

5.2. Effects of Gender-Neutral versus Gender-Biased Materials on School Children's Interest in Professional Careers

Some critics have pointed out the importance of studying the potential effects of gender bias in school children and not just their existence, claiming that students might not be influenced by gender stereotypes found in books.[79] Presuming that gender-stereotypes do have a negative impact on children (specially before the teen years as their

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[79] Albert J. Kingston and Terry Lovelace, "Sexism and Reading : A Critical Review of the Literature," *International Reading Association*, vol. 13, no. 1, 1977-1978, p. 155.

gender schema is being constructed), I conducted an experiment with 3rd and 4th graders on this subject.

With this experiment I tried to show some evidence of how gender-biased and gender-neutral depictions of occupations might shape children's interest in certain professional careers. The premise of this study was that when girls are presented with male pictures and references about a job, they are less likely to show interest in pursuing that job in the future, and vice versa for boys. I designed two sets of materials (pictures, jobs description and surveys): one was gender-biased and the other gender-neutral. In the gender-biased set, pictures of men were shown performing the following occupations: engineer, mechanic, computer technician, President, police officer, chauffeur, inventor, construction worker, scientist, and sportsperson. Male-gender language was also used to describe each of these jobs. Pictures of women performing the following jobs were also shown, together with female-gender language: nurse, teacher, psychologist, fashion designer, dancer, cashier, cook, phone operator, librarian, and hairdresser.

After socializing the pictures and job descriptions with the children they were given the survey and were asked to rate each job according to their preference in absolute terms (like it/ not like it).

5.2.1. Results of the Survey

Among the 28 children who participated in the gender-biased activity, a total of 294 careers were positively rated. Out of those, 185 corresponded to a job connected to the same gender as the respondent. Out of all the occupations that were chosen by the group of girls who were exposed to gender-biased materials, 67.31% were consistent with

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traditional female occupations. Boys who were exposed to the same materials also showed a tendency to choose careers consistent with the gender bias, however in a smaller percentage than girls: 60.53%. Combined, boys and girls' selection of careers not consistent with the gender stereotype was 33.48%.

It is interesting to note that boys seem to have a higher resistance to gender bias than girls, since they showed more preference for female careers than girls for male careers. This might be due to the fact that gender stereotypes are more pervasive towards women and limiting when it comes to occupations, and girls might have grown accustomed to being relegated to certain spheres, whereas boys do not feel such a strong impediment in crossing gender barriers.

On the other hand, the group of children that were exposed to gender-neutral materials showed a higher interest than the other group in careers traditionally linked to the other sex. Boys in the non-biased group chose a total of 56 female careers, and 67 male careers, meaning that almost half of their selected careers (45.53%) were traditional female jobs. In the same way, 44.77% of the total of girls' selections were male careers.

Although consistency with gender bias seems to decrease with exposure to gender-neutral images and language, it is important to observe that alignment with gender stereotypes persists nonetheless. We could make the assumption that, although non-sexist materials are important in order to increase children identification with professional careers regardless of sex, schools and textbooks are not the sole source of influence children are exposed to. It should also be noted that limiting views in career preference changed by exposure to one gender-neutral activity, and the effects of constant influence

of gender-neutral environments rest to be tested with expectations for highly positive

results.

## 6. CONCLUSION

My research set out to study gender depictions of occupations in primary school textbooks and has identified the nature and form of gender-biased stereotypes, the frequency, the diversity, and the role they play in overall gender occupational identity in the Dominican Republic. Furthermore, the study examined whether gender depictions can shape and limit children's interest in the occupations portrayed. The research on gender inequalities in the context of education in the Dominican Republic generally targets access to education and completion rates, failing to address how gender portrayals in textbooks can impact the gender gap. This research aimed to answer three main questions: 1. How pervasive are stereotypical illustrations of occupations in Dominican primary textbooks? 2. Do these gender-stereotyped illustrations hinder children's identification with the depicted professional career? 3. Is gender segregation in college enrollment related to the stereotypical depictions of occupations in the textbooks?

The main empirical findings addressing questions 1 and 2 are summarized in Chapter 5 *Results and Discussion*, and a detailed description of college trends among female and male students can be found in Chapter 3 *Gender Segregation in Education: the Dominican Republic*. This section will recapitulate some of the key findings to answer the guiding questions of the research:

1. How pervasive are stereotypical illustrations of occupations in Dominican primary textbooks? My research data shows that occupation gender bias is widely spread in primary textbooks in the forms of pictorial and textual references in detriment of female representation. The data also points at lower rates of girls' representation in

images, and women's representation in text. Nevertheless, adult females are demonstrably less represented than girls (both in text and images). Female occupations are less regarded through the texts than male occupations and are far less diversified. Females are typically depicted in careers that are connected to their stereotypical social role of nurturers, caregivers, and educators. Out of the six careers in STEM mentioned for females (doctor, engineer, mathematician, nurse, scientist, and veterinarian), half of them are health majors, which are heavily linked to femininity.

2. Do these gender-stereotyped illustrations hinder children's identification with the depicted professional career? The experiment I conducted, based on occupational depictions found in the textbooks, show that when both genders are portrayed performing an occupation, children from both sexes are more likely to show interest in pursuing that career and that, contrarily, gender-biased materials increase the chances of children choosing careers consistent with their own gender.

3. Is gender segregation in college enrollment related to the stereotypical depictions of occupations in the textbooks? My analysis shows some consistencies in the segregation of collegial trends and the occupational segregation portrayed in the textbooks. The majority of female occupational activities found in the textbooks fall into the academic fields of Humanities, Social Science, Education, and Health, which is consistent with the female college trends. Those occupations that are not directly linked to a college major are still related to traditional traits and behaviors attributed to women, such as clerical and customer service jobs. Nonetheless, studies targeting adolescents' preferences would better assess the impact of school materials in shaping career path.

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Current trends of gender studies point out at culture and socialization as one factor influencing gender stereotyping in children. My study contributes to the theoretical framework concerned with the construction of gender roles through textbooks and supports the claim that environment helps shape gender cognitive structures and, hence, children's gender identity. The socialization of gender-appropriate traits and tasks is performed, certainly, by a myriad of actors at different stages in a child's life. Some even argue that gender identity never ceases to change and develop, adjusting itself to different social and personal environments.[80] The school environment is crucial for any child's development, and textbooks are a universal constant in that context.

As some studies have pointed out, gender bias in textbooks tends to be a low priority on national agendas for development since the issues of access and parity in education tend to accumulate much of the attention.[81] My study shows that gender representation in school materials deserve more attention since stereotypical portrayals of women and men have undermining effects on girls' career choice. By consistently assigning different tasks and occupational spheres to each gender, textbooks inevitably code and imprint different gender-linked conducts and talents for men and women, becoming prescriptive tools for gender roles.

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[80] Thomas Eckes and Hanns Martin Trautner, " Developmental Social Psychology of Gender: An Integrative Framework," in Thomas Eckes, ed., *The Developmental Social Psychology of Gender* (New York: Psychology Press, 2000), p. 6.
[81] Rae Lesser Blumberg, "The Invisible Obstacle to Educational Equality: Gender Bias in Textbooks," *Prospects*, vol. 38, no. 3, 2009, pp. 345-61.

Dominican middle school girls are as good as boys in math and science. As a matter of fact, girls tend to outperform boys in all four main subjects during National Tests. However, young female high school graduates on the path to higher education are extensively choosing careers away from these academic areas. The reasons for this migration are not linked to academic performance. Gender bias, stereotypes, social sanctions, self-assessment, and absence of role models make it very difficult for girls to positively identify themselves with such careers. As the results of this research show, textbooks play a main role in the process by not providing boys and girls with the right tools for learning. By limiting the depiction of occupational and social roles, textbooks limit children's skills and abilities.

This research calls attention to the need for a robust gender approach in the curriculum revision. The Dominican Ministry of Education is currently carrying out an integral academic reform by designing a competence-based school curriculum. Content seems to be no longer the central topic in the discussion about quality of education. In its place 21st Century skills, life-long learning, and core standards are the crucial points being discussed. Given the socio-constructivist perspective under which the new curriculum is being built, gender as a social construct should be expected to hold a crucial position. However, there is little mention of the gender issue in the new theoretical underpinnings of the curriculum design, outside some general and vague goals.

Clear guidelines for gender depiction in school textbooks should be drawn, requiring equal representation in terms of numbers (female to male ratio) and occupational diversity (both genders should be portrayed performing all occupational

activities). Aside from dictating a reformulation of school materials, a program for teacher training in gender-sensitive issues should be drafted. Teachers are, ultimately, the ones who bring textbooks to life, transforming information into reality, and the influence they exert in children's modeling behavior should not be underestimated. In the same way, school administrators and academic staff must be taken into account for a successful gender-neutral policy implementation. School principals, area coordinators, curriculum advisors, and school materials purchasing managers must all be aligned with the principles of gender equality for the school culture to change.

Further research on gender-stereotyped content and depictions in textbooks should be carried out to establish successful strategies. My study was concerned with the early limitations that gender bias (especially depicted gender bias) may impose on primary school children. To create achievable gender-equality goals, there is need for extensive study on local cases to better assess the degree of incidence of gender bias. For example, adolescents who are on the verge of deciding what career path to follow might prove to be even more sensitive to gender role stereotyping. The scope of this discussion is therefore wide-ranging and complex, allowing for future multifaceted studies.

In spite of some policies targeting the elimination of all forms of sexism in school materials, Dominican primary textbooks are failing to provide a gender-equal environment. New social and economic systems are arising and local-specific cultural norms are being modified as women abandon traditional roles and embark themselves into new ones, both in the public and the private spheres. Next generations of Dominican students would benefit from textbooks that depict a new reality for gender roles.

**Table 1 National Tests Results for Math and Science 2012-2014**

| | **2012** | | **2013** | | **2014** | |
|---|---|---|---|---|---|---|
| **8th grade** | math | science | math | science | math | science |
| female | 14.77 | 15.26 | 15.19 | 15.49 | 15.03 | 15.36 |
| male | 14.67 | 15.15 | 15.18 | 15.34 | 15.02 | 15.17 |
| | **2012** | | **2013** | | **2014** | |
| **12th grade (general)** | math | science | math | science | math | science |
| female | 16.19 | 16.16 | 16.13 | 16.34 | 16.12 | 16.53 |
| male | 16.42 | 16.37 | 16.53 | 16.54 | 16.49 | 16.79 |
| | **2012** | | **2013** | | **2014** | |
| **12th grade (technical)[82]** | math | science | math | science | math | science |
| female | 17.31 | 16.87 | 17.32 | 17.06 | 16.83 | 17.18 |
| male | 17.93 | 17.18 | 17.96 | 17.39 | 17.69 | 17.68 |

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[82] Dominican high school programs are divided into two different modalities in the last two years (11th and 12th grades): General and Technical. The latter aims at careers in the fields of agronomy, engineering and services, being geared towards the developing of mathematical and scientific abilities.

**Table 2 Occupations Survey (translated in English)**

Mark with an X whether you like or whether you don't like the following jobs:

|  | I like it | I don't like it |
|---|---|---|
| nurse | | |
| engineer | | |
| teacher | | |
| mechanic | | |
| psychologist | | |
| computer technician | | |
| fashion designer | | |
| President | | |
| dancer | | |
| police officer | | |
| cashier | | |
| chauffeur | | |
| cook | | |
| inventor | | |
| phone operator | | |
| construction worker | | |
| librarian | | |
| scientist | | |
| hair-dresser | | |
| sportsperson | | |

**Table 3 List of Gendered-Biased and Gender-Neutral Occupations in Spanish**

| Spanish (gender-biased language) | Spanish (gender-neutral language) | English translation |
|---|---|---|
| enfermera | enfermera o enfermero | nurse |
| ingeniero | ingeniera o ingeniero | engineer |
| profesora | profesora o profesor | teacher |
| mecánico | mecánica o mecánico | mechanic |
| psicóloga | psicóloga o psicólogo | psychologist |
| informático | informática o informático | computer technician |
| diseñadora de ropa | diseñadora de ropa o diseñador de ropa | fashion designer |
| Presidente del Gobierno | Presidenta del Gobierno o Presidente del Gobierno | President |
| bailarina | bailarina o bailarín | dancer |
| policía | mujer policía o hombre policía | police officer |
| cajera | cajera o cajero | cashier |
| chófer | mujer chófer o hombre chófer | chauffeur |
| cocinera | cocinera o cocinero | cook |
| inventor | inventora o inventor | inventor |
| telefonista | mujer telefonista o hombre telefonista | phone operator |
| constructor | constructora o constructor | construction worker |
| bibliotecaria | bibliotecaria o bibliotecario | librarian |
| científico | científica o científico | scientist |
| peluquera | peluquera o peluquero | hair-dresser |
| deportista | mujer deportista o hombre deportista | sportsperson |

**Table 4 Number of Male Occupations Mentioned in Text**

| actor | educator | pilot |
|---|---|---|
| architect | engineer | pizza delivery man |
| artist | farmer | pizzeria worker |
| astronaut | federation president | plumber |
| astronomer | firefighter | poet |
| athlete | fish farmer | police officer |
| author | fisherman | politician |
| baker | gardener | potter |
| baseball batter | geologist | poultry farmer |
| baseball player | governor | President |
| beekeeper | ice-cream vendor | priest |
| biologist | inventor | real state agent |
| boss | janitor | rehearsal aide |
| bricklayer | journalist | runner |
| businessman | judge | scientist |
| butcher | lawyer | secretary |
| cabinetmaker | manager | senator |
| carpenter | mathematician | shepherd |
| cashier | mayor | ship captain |
| cattle breeder | mechanic | shoemaker |
| chef | member of parliament | soccer player |
| coach | meteorologist | sociologist |
| collector | miner | sportsperson |
| construction worker | monk | sugar-cane worker |
| corner shop owner | musician | sweeper |
| councilor | narrator | swimmer |
| craftsman | naturalist | tailor |
| cyclist | night watchman | teacher |
| delegation head | painter | technician |
| director | paleontologist | video game designer |
| doctor | pediatrician | watchman |
| doorman | philosopher | weaver |
| driver | physicist | worker |
| | | writer |

**Table 5 Number of Female Occupations Mentioned in Text**

| actress | school principal |
|---|---|
| author | scientist |
| baker | secretary |
| cashier | shepherd |
| cattle breeder | shop worker |
| chef | tailor |
| construction worker | teacher |
| cyclist | theater founder |
| data entry clerk | traffic agent |
| doctor | veterinarian |
| educator | weaver |
| engineer | writer |
| factory owner | |
| farmer | |
| hair-dresser | |
| journalist | |
| lawyer | |
| librarian | |
| mathematician | |
| nun | |
| nurse | |
| office clerk | |
| phone operator | |
| poet | |
| politician | |

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