



## Analysis of the paratextual elements of the manual of arithmetic *Taboada Curiosa* (Portugal, 18th century)

### Análise dos elementos paratextuais do manual de aritmética *Taboada Curiosa* (Portugal, século XVIII)

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#### Abstract

This article presents an analysis, under the perspective of the History of Education (and) Mathematics, of the paratextual elements that compose the educational instructions for the teaching of arithmetic present in the pedagogical manual *Taboada Curiosa* that was written by spanish professor Joam Antonio Garrido. Initially published in 1737 in Lisbon, the work was intended to instruct in the art of counting and writing through the rules that have been applied in the "good Schools" of the Kingdom of Portugal. We consider that *Taboada Curiosa* was a print of relative editorial success in the context of the seven hundred Portuguese, becoming an efficient pedagogical mechanism for the construction of arithmetic meanings. We will focus our analysis on the peripheral elements that make up the print, especially in the frontispiece, dedication page, the prologue and the summary, highlighting how the arithmetic professor Joam Garrido established discursive strategies of reading directions to his potential consumers of the work.

**Keywords:** History of Education, Arithmetic Manual, 18th century.

#### Resumo

Este artigo apresenta uma análise, sob a perspectiva da História da Educação (e) Matemática, dos elementos paratextuais que compõem as instruções educativas para o ensino da aritmética presentes no manual pedagógico *Taboada Curiosa*, de autoria do espanhol Joam Antonio Garrido. Publicada inicialmente no ano de 1737 em Lisboa, a obra tinha por objetivo instruir na arte de contar e escrever por meio das regras que se aplicavam nas "boas Escolas" do Reino de Portugal. Consideramos que *Taboada Curiosa* foi um impresso de relativo sucesso editorial no contexto do setecentismo português, tornando-se um eficiente mecanismo pedagógico para a construção de significados aritméticos. Centraremos nossa análise nos elementos periféricos que compõem o impresso, sobretudo no frontispício, nos agradecimentos, no prólogo e no sumário, destacando como o professor de aritmética Joam Garrido estabeleceu estratégias discursivas de direcionamentos de leitura aos seus potenciais consumidores da obra.

**Palavras-chave:** História da Educação, Manual de Aritmética, Século XVIII.

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## Introduction

Studies relating to the fields of History of Education (and) Mathematics and their different ways of perceiving the educational process of certain times put us in front of countless possibilities for observation and research. It is the responsibility of the researcher in these fields to expand the conditions of visibility on the processes that constituted the educational practices of school and non-school Mathematics, which in the temporal dynamics materialized in discourses and practices about its teaching. It is important to emphasize that for the historian in Mathematics Education Wagner Valente (2005), research in the History of Mathematics Education is inscribed in the field of History, and more specifically, it should refer to the field of History of Education.

We will consider in this study as a definition for paratext, according to Genette (2009), any textual or graphic part that somehow maintains a strategic relationship with the corresponding text of a work. Whether to characterize its legitimacy or to influence reading or interpretation, paratexts are tacit elements of the author and/or editor of the work. Preliminary elements such as cover, title, licenses, frontispiece, summary, dedication page, prologue, etc., acquire valuable importance for historical studies both as a documental source and as elements of analysis, as they represent, within a collective system of symbols, the possible relationships and meanings established between authors and editors with potential readers. The data that will be analyzed here reiterate the importance of the reader shown in the paratexts and highlight possible links between the author and the reader, thus establishing a possibility of fidelity between them.

It will be from the perspective of these two fields of research, the History of Education (and) Mathematics, that our investigation will be centered. Thus, this article aims to identify and analyze the discursive strategies that the master of arithmetic Joam Antonio Garrido used to write the *Taboada Curiosa* arithmetic manual in the first half of the 18th century. Based on this objective, this text was organized as follows: first, we analyze how the entry *arismetica* was defined in the Portuguese context of the 18th century. The etymological examination makes it possible to indicate the extent to which mathematical knowledge was understood in a given and dated society. We also identified a series of works printed in the centuries immediately prior to the 18th century that dealt with arithmetic. Such a survey gives us the possibility of identifying the masters' compliance with a "typical" mathematics teaching method. It is evident that this methodological typification will also be present in eighteenth-century pedagogical manuals. Therefore, we built a table with the main works directed to the teaching of reading, writing and counting that were printed in the 18th century; second, we identified how the author of the aforementioned work favored certain mathematical knowledge, seen as necessary for the educational process of Portuguese subjects at the time. For this, we present aspects of the materiality of the work, the number of editions and some paratextual elements (frontispiece, dedication, licenses, acknowledgments, prologue and preface) present in Garrido's book, which sought to justify and previously announce a success in the publishing market throughout the XVIII century.

## Arismetica or The art of counting: perspectives and historical contexts for its teaching

The etymological analysis of the word arithmetic reveals that its derivation occurs from the Greek *arithmḗtiké*, which means the art of counting and of *arithms*, which translates the idea of number. The lexicon takes on a similar meaning in Latin, as *arithmetica* also indicates the art of counting. In the Portuguese lexicographical field *arismética* or *aresmética* are archaic words, whose printed uses for the teaching process date back to the 16th century.

According to the survey carried out by Almeida (1992, v. 1, p. 67), the term *arismética* appears in the frontispiece of printed material in the 16th and 17th centuries by the following Portuguese authors: Gaspar Nicolás (1519, 1530, 1541, 1559, 1573, 1590, 1594, 1607, 1613, 1679); Ruy Mendes (1540); Bento Fernandes (1555), Gaspar Cardoso de Sequeira (1612, 1626, 1651, 1675, 1686) and Afonso Guiral e Pacheco (1624).

During the 18th century in Portugal, mathematical prints such as that of the merchant of the city of Porto, Afonso de Villafanhe Guiral e Pacheco, were systematically reprinted. Such importance is due, above all, to the fact that the resolution of social problems, generally associated with measures and quantities, are converted to a practice of written calculation with a schooled nature. In this sense that “mathematical knowledge operated in manuals for education are immersed in a long historical process of literacy of the population, marked by relationships linked to the social context of the use of numbers” (Amaral & Ripe, 2017, p. 251). In the 18th century, the expansion of printing houses and the evident progress of schooling practices in Portugal were conditions of possibility that allowed the printing of pedagogical books to gain use and circulate among specific social groups, whether urban or more affluent who intended to have a better education close to the standards of the Portuguese Court. Jean Hébrad (1989, p. 63) pointed out in the case of the “pequeñas escuelas” (small schools) of the Old French Regime, that instruction did not go beyond a limited literacy course necessarily accompanied by a Christian religious instruction. For the French historian Hébrad (1989, p. 63)

[...] The knowledge taught then seemed to be, more than disciplines, different facets of the ordinary practices of written culture, conceived indistinctly as a support for religious doctrine or as a necessary instrument for the management of their life and their affairs, however trivial they might be.

However, this is not exclusively about the proliferation of eighteenth-century schooling, as the publication of certain scientific knowledge from the Portuguese 17th or 16th century, such as astronomical navigation, mechanics and business calculations, created more complex arithmetic emergencies, promoting its development.

The dictionary meanings of *arithmetica*, in the Portuguese eighteenth century, define as “art of calculating by digit” (Silva, 1789, p. 179) or as “the art of counting, whose main rules are to add, subtract, multiply, divide, &c ” (Bluteau, 1728, p. 496). Considering that the conception of art, present in both meanings, refers, in this period, to the idea of method and

rules, we can show that arithmetic was fundamentally constituted by a regulated practice (Ripe, 2017, p. 146).

In the Portuguese eighteenth century a series of printed material sought to explain the teaching of the first letters. This process was largely related to the learning of reading, writing, counting or, for the more skilled, arithmetic, the incorporation of Christian doctrine and civility regimes.<sup>3</sup> Learning to read was constituted as an essential practice in elementary schools. Nevertheless, reading, writing, and calculating levels were coefficients of social distinction. The child's age to start reading could vary according to the teaching method to be followed, most of which indicated the age of seven, or by the insistence of a particular teacher.

In general, the textbooks that instructed the learning of writing recommended that the skills in tracing should only be started after the student had full mastery of reading. It is observed that:

A child should only begin writing after knowing how to read the entire printed letter freely and when had some firmness in their hand, on whose movements the formation of the letters depends; a weak and unsteady hand, instead of letters, forms 'scribbles and scrawls, getting used to them and losing the knack for the good shape of the characters (Adão, 1997, p. 229).

Alongside to reading, writing and counting – and equally relevant – was the learning of the Christian doctrine that, together with the domains of the rules of civility, made up the proper formation of a future Portuguese “citizen”. The instructions of the Christian catechism were anticipated from the child’s entry into the school environment. Even without knowing how to read, the child should learn by heart the main prayers (Our Father, Hail Mary, Credo and Confession) and the Commandments of the Law of God and the Church (Adão, 1997, p. 235). In the process of learning the catechism, the disciple was encouraged to develop the habit of memorization. Through questions and answers, the student was encouraged to memorize “difficult words and abstractions, requiring a mechanical repetition of sentences without an understanding or interiorization of the content on his part” (Adão, 1997, p. 235).

The teaching of civility rules, synthetically, consisted of learning a set of conventions that socially governed the way subjects should behave. These manuals and textbooks sought to dictate the formatting of a personal discipline, a specific way in which the child should control their attitudes and gestures, always contained and adequate to the environment.

As for the manuals that taught arithmetic, most remained faithful to the teaching model proposed by Gaspar Nicolás in the 16th century. However, some changes can be seen in the specific framework of realities, that is, the social contexts of the use of numbers. If, on the one hand, the teaching of arithmetic remains guided by continual imitation through

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<sup>3</sup> It is observed that this didactic proposition does not deviate from the idea of *quadrivium* (the four paths or ways), since it establishes one of four subjects taught in the initial phase of the educational path. Suggested reading Aranha (2006).

exhaustive examples, on the other hand, problems relating to measures and quantities are adapted by social practices that “reflect certain particular forms of technical progress and advancement of the Portuguese Society” (Almeida, 1992, v. 2, p. 7).

Based on the study carried out by the historian of education Áurea Adão (1997), we created a table listing the main authors who published manuals related to the teaching of arithmetic throughout the Portuguese eighteenth century.

Table 1 – List of pedagogical manuals published in Portugal (18th century)

Author	Year of edition	Book
Figueiredo, Manuel de Andrade de	1722	<i>Nova escola para aprender a ler, escrever, e contar...</i> , Lisboa Occidental: Na Offic. de Bernardo da Costa de Carvalho.
Garrido, Joam Antonio	1737	<i>Taboada curiosa, novamente reformada, e argumentada...</i> Lisboa: Offic. Offic. de Rita Cassiana.
Oliveira, Francisco de	1739	<i>Arithmetica verdadeira, ou arte facilíssima de contar...</i> Porto: Ed. Autor.
Pereira, Francisco de Queiroz	1749	<i>Compendio arithmetico, obra muito util para principiantes aprenderem com facilidade...</i> Coimbra: Real Colegio das Artes.
Silva, Leonor Thomazia de Souza e	1756	<i>Escolla nova christã, e politica...</i> , Lisboa: 1756.
Rego, Jozé Antonio da Silva	1774	<i>Dialogo da Arithmetica, em que se explicão as quatro espécies de contas, e se toca a Astronomia...</i> Lisboa: Offic. da Viuva de Ignacio Nogueira Xisto.
		<i>Taboada para a numeração. Para uso das Escolas de N. S. das Necessidades.</i> Manuscrito, com licença para impressão em 09.11.1777.
		<i>Escola fundamental, ou methodo facil para aprender a ler, escrever, e contar...</i> , 1807. Autorizada a 1ª edição em 25.02.1779.
		<i>Elementos de Arithmetica ou regras de numeração (...) para uso das primeiras escolas.</i> Manuscrito, com licença de impressão em 10.04.1783.
Souza, Pe. Manoel Dias de	1784	<i>Nova escola de meninos. Na qual se propõem hum methodo facil para ensinar a lêr, escrever, e contar, com huma breve direção para a educação dos meninos. Ordenada para descanço dos Mestres, e utilidade dos Discipulos.</i> Coimbra: Na Real Officina da Universidade
	1784	<i>Argumento em forma de dialogo, introduzindo dous Estudantes: Hum que diz não haver necessidade de Arithmetica, e tem por opinião, que não ha ninguém que não saiba contar, tendo dinheiro; e o outro defende o contrario.</i> Lisboa: Offic. de Francisco Luiz

		Ameno.
Vasconsellos, Anna Sylveira de		<i>Escóla nova ou tesouro de meninos, em diálogo entre huma sabia May e seu filho.</i> Manuscrito, com licença de impressão em 07.07.1785.
Sá, Manuel de		<i>Taboada geral, ou noçoens preliminares da Arithmetica. De novo recompilada pelo methodo Socratico, ou dialogístico para a Instrução da Mocidade Portugueza.</i> Manuscrito, com licença de 3ª impressão em 18.02.1788.
	1789	<i>Conferencia literária, dividida em doze liçoens. Nas quaes se dá aos meninos, que frequentão a escola huma breve, e bem limitada idêa geral de Gramatica Portugueza, e das partes de que consta; e tambem da Arithmetica, e Doutrina Christã. Composta por um professor de Lingua Portugueza. Para uso de seus Discipulos.</i> Porto: Offic. de Bernardo Antonio Farropo & C. <sup>a</sup> .
Viterbo, Fr. Antonio de Santa Rosa de		<i>Proposições de principios fundamentais d'arithmetica, que publicamente, na Igreja do Real Collegio do Espirito Santo da Cidade d'Evora, no dia 26 de Maio de 1790, defendêrão sete meninos da Escola Regia do mesmo Collegio...</i> Lisboa: Offic. de Simão Thaddeo Ferreira, s.d. (com licença de impressão em 19.08.1790).
	1794	<i>Methodo facil de aprender a contar, em que se explica todo o gênero de contas juntamente com a sua razão, uso, e demonstração...</i> Lisboa: Offic. de Simão Thaddeo Ferreira.
Barbosa, Jerónimo Soares	1796	<i>Eschola popular das primeiras letras, dividida em quatro partes. Parte quarta. Arithmetica vulgar.</i> Coimbra: Real Imprensa da universidade.

Source: Table drawn from Adão (1997).

The Portuguese pedagogical discourses of the second half of the 18th century were, to a large extent, influenced by the Pombaline political management. It was through the promulgation of the Royal Charter (Carta Régia) of November 6, 1772, that the masters were responsible for teaching in the royal schools of first letters the teaching of reading, writing and counting, in combination with catechism and the rules of civility (Carta, 1772, p. 291).

In these manuals there is a tendency to indicate to teachers the role of developing educational activities related to the child's moral formation and the acquisition of knowledge. It is worth noting that “good education”, in this context, is recurrently referred to as the insertion of customs related to good Christians so that in the age of reason they make the good of the Republic possible. (Adão, 1997). However, it was also warned that the instructions were not restricted to the disciple's simple memorization, transforming him into a “confused store of facts”. The teaching of the masters to the disciples should be ordered to “clarify the notions that correspond to the most common terms, in getting them used to

distinguishing them well, and to knowing exactly the proportions, and analogies, that they keep with each other” (Villeneuve, 1767, p. 98).<sup>4</sup>

With regard to learning arithmetic, the manuals warn that the disciples would only learn to do counting and other “kinds of calculations” after having mastered reading and writing. In this sense, the teaching of arithmetic would correspond to the final level of elementary education. Therefore, mastering the counting and calculation procedures (arithmetic operations), in a modern society that intended to be civilized and literate (especially in reading environments), could indicate a certain social distinction.

Among the pedagogical manuals (according to table 1) that describe the teaching of arithmetic, one of them had a relative editorial success throughout the Portuguese eighteenth century. It is the work of *Taboada Curiosa*, composed of three parts and added with various curiosities related to the numerical field and learning to write. In the first chapter, professor of arithmetic Joam Antonio Garrido presents the definition of weight, counting and measure. According to the author, these definitions are necessary to present “the general rules, from which all calculations are formed, plus all the variety of currencies that circulate in this Kingdom, and others in Europe” (Garrido, 1752, p. 01).

### ***Taboada Curiosa*: analysis on paratextual elements**

The arithmetic books that circulated in Europe in the modern period were produced from problems and experiences arising from the field of business and the needs of merchants. In addition to the mercantilist aspects, arithmetic manuals roughly also “determine and clarify calculation progress and impose algorithmic criteria” (Almeida, 1992, v. 2, p. 06).

The internal structure of these arithmetic books denoted, for the most part, relative homogeneity, as they presented aspects that were repeated, for example, the paratextual elements. Next, the presentation of the concept of arithmetic as an art and, consequently, learning to read numbers. Áurea Adão (1997, p. 257) draws attention to the fact that it was “through writing and studying the multiplication table, [that] the students began to know the figures by heart”. Garrido offered the Roman numeration as the next stage of learning, but this sequence was not consensual, as some authors chose to leave it for later. A fundamental condition for the “good” student was the mastery of the kinds of calculations, such as addition, subtraction, multiplication and division, also called *repartition*. The teaching of species was carried out through examples. Rarely, in these stages, was proposed as a teaching method the problem solving to apply the mathematical operations under study. That said, it was time to teach – only to the most skilled – the contents, which in general were very associated with mastering the idea of quantification. It will be the development of arithmetic contents, defined by applications related to weight, calculations and measures, that the

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<sup>4</sup> A more detailed analysis of the teaching models of masters of reading, writing and counting was described by Áurea Adão in the splendid work *Estado Absoluto e ensino das primeiras letras* (1997).

manual will be properly elaborated, fulfilling the desire manifested by the author in the frontispiece of the work. So it was described that the manual was for “that it deals with all the general rules, and types of calculations, which a good accountant must know for dealing and commerce in this Kingdom, and in the whole world, with other curious and useful news, based on calculation numbers” (Garrido, 1752, Frontispiece).

Little is the information we have about the author of *Taboada Curiosa*. It is known from the *Diccionario Bibliographico Portuguez* (1859, p. 290) by Innocencio Francisco da Silva (1810-1876) that João [Joam] Antonio Garrido was “a native of los Cameros, a village in the kingdom of Spain; from where he came to Lisbon, he lived here for many years, exercising the profession of Master of Arithmetic and Writing”. Innocencio da Silva indicated that he was familiar with two of Garrido’s works, whether it was the arithmetic manual found in the fifth reprint or a book on agriculture, which had also been reprinted several times. However, Silva did not spare criticism of the master Garrido and both claimed not to know the previously printed versions, as he rejected the quality of the texts that made up his works.

These works have nothing to recommend them; the very language in which it is written is such that the collector of the so-called *Academy Catalog* left them in the dark, not deserving of credit, not even with regard to the optional voices used in them (Silva, 1859, p. 290).

In fact, the work *Taboada Curiosa* received little attention in the 19th century, having only one edition printed in the year 1815, but as we can see in the table below, in which we catalog the different reprints of the arithmetic manual, Garrido's work was of relative publishing success in the Portuguese kingdom during the final three quarters of the 18th century. Circulating especially in the city of Lisbon, where it was printed and sold.

Table 2 - List of editions that were possible to catalog the work *Taboada Curiosa*

<b>Edition</b>	<b>Year of Publication</b>	<b>City</b>	<b>Publisher and/or place of sale</b>
1 <sup>a</sup>	1737	Lisboa	Offic. de Rita Cassiana
2 <sup>a</sup>	1739	Lisboa	Vende-se na Escola da rua dos canos, e em outras do bairro alto.
3 <sup>a</sup>	1747	Lisboa	Officina de Domingos Rodrigues
4 <sup>a</sup>	1752	Lisboa	Officina de Domingos Rodrigues. Vende-se este livro na mesma Offic., em casa do Autor e debaixo dos arcos do Rocio.
5 <sup>a</sup>	1759	Lisboa	Ignacio Nogueira Xisto. Vende-se na mesma Officina, no principio da Rua dos Cavalleiros.
6 <sup>a</sup>	1772	Lisboa	Off. da Viuva de Ignacio Nogueira Xisto
7 <sup>a</sup>	1788	Lisboa	Officina de Francisco Borges de Sousa



8 <sup>a</sup>	1814	Lisboa	Imprensa Regia
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Source: Table prepared by the authors.

According to the frontispiece of the edition we are analyzing (see Figure 1), at the bottom of the page it is possible to identify that the pedagogical manual had the authorization to print and all the necessary licenses, being its commerce carried out inside elementary schools of the city of Lisbon. In this case, it could be inferred that the number of printed materials matched the number of students attending such schools. We can certainly denote that it was a pedagogical print well received by the public, as it had at least eight editions in different printing houses in Lisbon over almost a hundred years, which was something very unusual for pedagogical books.

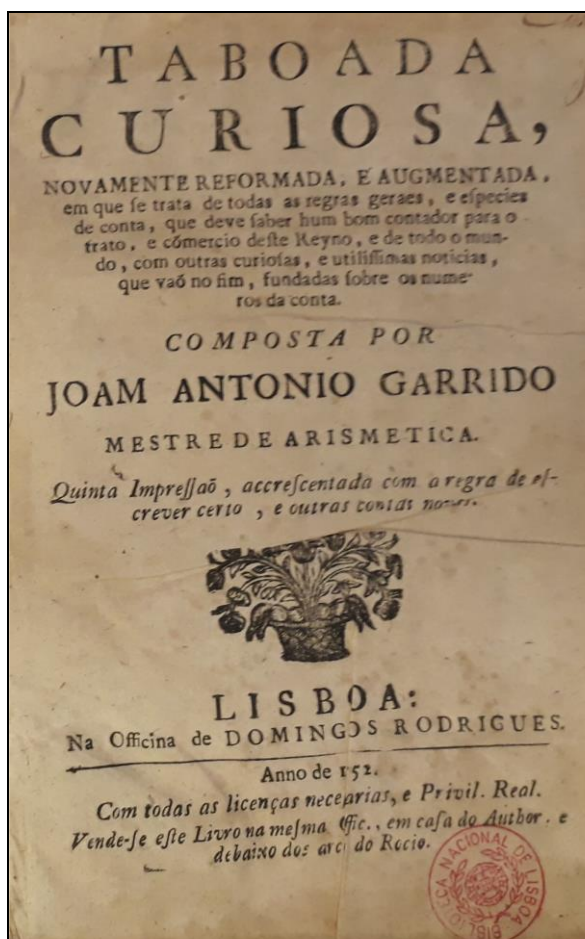


Figure 1 – Frontispiece of the work *Taboada Curiosa*  
Source: Garrido (1752).

We had access to two editions of the work. The first, in its digital version, dated 1739 – access to which is available in the Google books digital database; the second, published in 1752, is a printed version available for consultation at the Biblioteca Nacional de Portugal (BNP, National Library of Portugal). We will adopt as object of analysis the last one because it is a “again reformed, and increased” edition (Garrido, 1752).

In the prologue of the work, the arithmetic professor Garrido intends to present the entire contents [...] of the book to the reader. As a way of bringing the author and reader closer together, Garrido justifies the teaching method that makes up *Taboada Curiosa*. In the words of Garrido (1752, Prologue):

Supposing, dear reader, that all the Arts consist of certain rules, or parts, which together constitute a whole; and supposing that the parts on which Arithmetic is based are numbers, weight and measure, all connected with the universal *Taboada* to form all sorts of calculations, it is certain that these parts must know distinctly whoever wants to be a good accountant.

The title of the work *Taboada Curiosa* already indicates the method that its author prioritized. The composition of “tables” designates that teaching will be composed of a set of rules systematized in tables and charts, which the “curious” disciple should constantly consult, until having possibly memorized them. For example,

Since no accountant knows, when he learns, which calculation he will use and need the most, he should know them all; and also for the great union and dependence that some calculations have on the other, as will be seen here explained with examples of each kind, as experience has shown us, and it is practiced in all good Schools (Garrido, 1752, Prologue).

Another important element present in the paratexts of modern Portuguese prints are the justifications that the authors describe for the printing of the work. Garrido gave the following reasons for publishing his pedagogical manual:

I find myself in my school to teach generally everyone, rich and poor, nobles and commoners, little ones and great ones, what I knew; I was also put there to learn many things I didn't know, which experience taught me [...] several adult people came to me, some with ignorance, and others with malice for trying out my knowledge in the course of thirteen years that I had public school. By asking me several calculation propositions, as I will point out some here, so that the new Accountants can try them (Garrido, 1752, Preface).

Such propositions constitute the index of twenty-seven themes that the work presents. The themes were proposed after the author had described the learning process “all kinds of calculations”, namely: “addition, subtraction, multiplication, and division”, added with the following mathematical contents: “operations with decimals, interest, rule of three, conversion of units, exchange rates, square root, and cubic root”. Such contents would be enough for the applied teaching of arithmetic. The fact that the last chapter was directed towards the teaching of the “Rules of writing right” – which addressed the direction of learning “the letters, with which one writes, and the syllables that are formed from them” (Garrido, 1752, p. 91) – prevents us from asserting that the work is a strictly arithmetic manual.

Strategically, the master of arithmetic Garrido bases the first twelve propositions to deal with mathematical quantities. Always placed in the form of problematization. For example:

I. A certain Doctor asked me: how many millions were 800 contos of reis (currency)?

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- II. A Baker asked me what the price of a bushel of wheat was, buying the bunch for twelve thousand reis (currency).
- III. A cattle dealer asked me how much a cow, which weighed 10 arrobas, yielded him, and the arratel was sold to 48 reis.
- IV. A tavern keeper asked me how much a barrel of wine would yield him, sold by *canada* for one *tostão*.
- V. A Sacristan asked me how many pitchers of oil would be needed in one year for three lamps of his Church, considering that one uses a pint each day.
- VI. A goldsmith asked me how much would it cost three silver marks and two 18k gold octaves.
- VII. A Knight asked me how much 4000 Cruzados a year would yield both weekly and daily.
- VIII. An Italian asked me how many leagues was 30 miles.
- IX. A printer asked me at what price [...] (Garrido, 1752, Index).

The creation of an index full of problematizations involving the social uses of numbers – in the urban Lusitanian daily life of the eighteenth century – can be seen as a discursive strategy that its author uses to convince or, perhaps, to arouse the curiosity of potential readers. In this sense, the summary would have the function of “dragging” the reader into the work. It is also observed that in the set of problems mentioned by Garrido, the exercises appear to be correlated with commercial activities. Such conditions symbolically represent a social framework of living with business which is comprised of exchanges, barter, trading goods and dealing with money.

Somehow what Garrido proposed is that the reader would acquire his book not simply as a resource but also as an instructional guide. So it could be read and reread whenever one needed its rules or to check distances, measurements or magnitudes in professional activities. Notably, the reader is called upon to attribute meaning to what is learned, since there is a clear approximation between the mathematical objects being studied, with the very contextualized social practices. In this way, the disciple should be able to recognize everyday situations in mathematical knowledge.

The Spanish Arithmetic Master Joam Antonio Garrido (in the 1730s he had been naturalized Portuguese by “S. Majesty in this Kingdom”), believed that in order for a book to “go public” it required a “protector”. The well-known professor of mathematical calculations in the city of Lisbon brought to public the second edition of his “Book Taboada Curiosa de Contas, newly revised and increased in the light of accountants and in benefit to all Schools”, therefore it needed “a Protector as great as” the “very worthy person of Your Excellency” D. Valério da Costa de Gouvea (1678- 1742). It was an exemplary figure chosen by Mestre Garrido, as Gouvea held the position of Vicar General of the Patriarchate of Lisbon and had been a Court Judge, as well as having a bachelor’s degree from the University of Coimbra

and had already held important positions in Portugal and America, being then a clergyman of great prestige.<sup>5</sup>

The fact is that Garrido thought it was necessary to clarify the reasons for having dedicated such print. He then gave his reasons:

Three Great Ones of Shepherding I saw govern the great flocks of this world, which are, Mayoraes, Zagaes, and Pastorinhos, and other three great ones I see shepherding in the mystical flock of the Sheep of Lord Mayoraes. The Ecclesiastical Prelates, who govern souls with general jurisdiction, like Your Excellency, throughout this Patriarchate, Zagaes. The Curates, Parish Priests with particular jurisdiction in their parishes, and Pastorinhos are the Master of Boys, who take care of the lambs within the limits of their School. I see myself constituted by Your Excellency, in this obligation to also graze sheep, who are in my charge, as a legitimate Master of Boys, and listening to me balling these sheep over the pasture of the Doctrine, which nourishes souls, [...] Seeing that the little ones asked me to address their doubts in this book in a distinct and minute way, given the greatness of such doubts, I was able to understand their short capacity, and hearing me exclaim to God for His Prophet Ezekiel about Shepherds, who being diligent with themselves, are negligent in pasturing their sheep [...] in carrying out my duty, I decided, with great work and zeal, to discover and prepare (based on calculations) this fruitful field of human and Divine letters, in which these new sheep and lambs of the Church would graze and nourish themselves with spiritual documents. And for it is a property of the good Shepherd, to graze his sheep [...] – here, I offer Your Excellency, as a good Shepherd who is in the Patriarchate of Lisbon, this fertile field of letters, which could serve as a good pasture for all his sheep (Garrido, 1739, Dedication).

Despite being extensive, the excerpt from *Taboada Curiosa* is extremely significant, insofar as its author, a “Master of Boys”, describes how he understands the process of constitution of a child, or how he called the three ways of governing the herds. It is important to highlight that in this process, Garrido perceives the practice of teaching arithmetic as a form of education and conducting the behavior of children. In this sense, the author associates the practice of learning numbers with the process of Christian devotion assumed by the Catholic faithful.

Even before actually starting the first part of the work *Taboada Curiosa*, and following the strategy of bringing the reader closer to Christian elements, the author presented in three pages a letter written by Friar João de Nossa Senhora (1701-1758). It was a *redondilha*<sup>6</sup> that the Portuguese canon had made for his friend and admirer João Garrido. Friar Nossa Senhora was a popular Franciscan friar at the Convent of São Francisco de Xabregas in Lisbon. He was famous for his rhyming skills. To Garrido he dedicated some of the following words:

<sup>5</sup> Machado, D. B. (1752). *Bibliotheca Lusitana. Historica, Critica, e Cronologica. Na qual se compreende a noticia dos Autores Portuguezes, e das Obras, que compuzerão desde o tempo da promulgação da Ley da Graça até o tempo presente*. Tomo III. Lisboa: Na Officina de Ignacio Rodrigues, p. 769.

<sup>6</sup> A *redondilha* (roundel) was the name given, from the 16th century onwards, to verses of five or seven syllables - the so-called old measure. Those with five syllables were called the smaller *redondilha* and those with seven syllables, the larger *redondilha*. The *redondilha* was widely used by Portuguese poets such as Luís de Camões e Garcia de Rezende.

My great friend, and Lord  
 João Antonio Garrido.  
 In Portugal known  
 As famous accountant  
 [...]  
 A small book without greed  
 You gave me, for a good thing,  
 where i saw all of Lisbon  
 As House of Justice.  
 My will is obliged  
 To see your ways  
 Here I am counting everything  
 Through your Taboada.  
 [...]  
 You put everything in digits  
 For such profound numbers,  
 May everything you count in worlds  
 In the sky, the land, and abysses  
 Everything in worlds been counted  
 The calculation, if more would fit  
 And if more world there was  
 [...]  
 Singular as only the Sun is,  
 If there you were born Spanish,  
 You are here and today Portuguese.  
 God keep you, and renew you  
 With grace in the gentle soul  
 Fifteenth of march, Seven  
 Hundred Thirty Nine

The Portuguese friar recognizes in the figure of Garrido an important Spanish accountant who in the city of Lisbon had gained notoriety as a master of arithmetic. Nossa Senhora finishes his redondilha (roundel) dating March 15, 1739, the year of publication of the second edition of *Taboada Curiosa*. The 1739 reprint contained, in addition to the three necessary licenses – Do Ordinário, Do Santo Ofício and Do Paço –, a Summary of the Royal Privilege. In this Summary, the right of Joam Antonio Garrido to print and sell his book *Taboada Curiosa* was expressed by order of the Portuguese Majesty, in the same way he recognizes the author as “a professor of Arismetica, naturalized by His Majesty in this Kingdom” (Garrido, 1739).

The textual approach that Garrido makes between arithmetic knowledge with elements of Christian religiosity can be seen from some strategic possibilities used by the author. Firstly, the speech elaborated by ecclesiastics to Garrido, paying him excessive praise, grants him recognition and authority as a “master of boys”, also validating, throughout the Court, his knowledge as a master of arithmetic. Such ecclesiastical laudatory was a way of converting the arithmetic teacher’s discourse into a printed form, which gained conditions of treatise for the teaching and learning of arithmetic. In general, the arithmetic treatise had this

double attribute, as it was intended to help both masters who wish to teach the important art of counting and apprentices who could memorize all kinds of calculations using the “taboas”. And secondly, because of the fact that education applied in Portuguese royal schools in the 18th century was closely linked to the domain of reading, writing, counting, praying and behaving. Therefore, Garrido followed the conforming discourses of a society that intended to be literate along the lines of the great European urban centers, but with the religiosity and social behaviors typical of its Kingdom.

## Final considerations

Joam Garrido spared no efforts to describe arithmetic as a social practice, so much so that, as far as possible, he sought to conceptualize the meaning of “cousas” (same as “coisas” - things) through the main treatises of the time. In the words of the author:

[...] it seemed to be useful and convenient for me, and for every accountant, to make this new Taboada, first consulting *Calepino*, *Prosodia*, *Bluteau*, *Hortega*, *Moya*, *Pereira*, and *Brito*, and further Authors, that briefly the most important rules, and related to counting, which I found distributed in several Books (Garrido, 1752, Prologue).

The teaching of definitions and concepts of the most trivial mathematical elements was aimed at learning the quantification. The teaching of quantification was Garrido's ultimate goal, “he can't do the whole calculation well without first knowing the definition of the calculation, weight, and measure, which are the rules it contains”. This teaching proposal can be perceived as a possible criticism directed at the teaching methods used by other teachers, as “This seems to me as teaching with foundation; teaching the parts including the whole, and not teaching the whole without its parts, as some do” (Garrido, 1752, Prologue, p. 5).

Another paratextual element used in the work is the claim that the printed material results from the need of young apprentices and from the request of the most beginner accountants.

After I have taught all the rules, and calculations, contained here, to my disciples, they will eagerly ask me to make them a notebook, or summary of them all, to refresh their memory lest they forget; but I am afraid of doing what the other Masters of this Court have not done, and seeming to me excessive work, and the cost of doing it with a pen for each individual in particular, being for everyone more communicable and cheaper, with printing; I've decided to do it this way at the behest of many: although there are many other, and several books, that deal with calculations, they couldn't find, nor did I find it, in the Portuguese language, someone who deals with this matter so clearly and in such a concise manner as herein, as it points out the definition of weight, calculations, and measure, with the variety, and value of the currencies, which run in this Kingdom, and others in Europe, and with the examples of all calculations so practical, and intelligible, as a guide the new accountants, and as a remembrance for the forgetful ones (Garrido, 1752, Prologue).

After the first edition of *Taboada Curiosa* gained popularity and circulation in the Kingdom, the occurrence of some controversies in the Portuguese Court seemed to condemn the method used by Joam Garrido, as well as intending to censor his work. However, its author also used paratextual writing as a way to justify and defend himself from the attacks he suffered.

After *Taboada Curiosa* had been printed, the first time with good acceptance by prudent accountants and the best Masters of the Court; The most miserable [unfortunate] of my profession came to me, saying that such *Taboada* was ignored, (and judging everyone for themselves) that everyone knew this, that it could be found in books, that there was nothing new here, and other contempt, which I don't mention. May God deliver me and my work from such despicable people, for by these I understand what Christ said by S. Matthew ch. 7 to 6 *Neque mitatis margaritas vestras ante porcos, ne fonte couculcent e as pedibus suis*. Neither throw your pearls before the pigs, lest perhaps they trample them under their feet. And so to the pious Reader here I lay my work; because only he will know how to appreciate it, and know my work, and will, which I had to serve God, and the Republic with this useful work (Garrido, 1752, Prologue).

As it was possible to see throughout this investigation, the analysis of paratextual elements is not restricted to enunciating the educational process that the author intended to convey. In *Taboada Curiosa*, the paratextual writing favored two sentences, which we confirm in this text as discursive strategies used by its author.

The first strategy present in the print was the manifestation of a network of influential subjects in the Portuguese Court. Composed of religious, typographers, jurists, as well as the censors themselves who legitimized the printing of the arithmetic treatise, the compadrio network attested that Joam Antonio Garrido was an important “master of boys” who carried out the teaching of arithmetic with enormous skill. This network also made it possible for the Spanish teacher to be recognized by *el Rey* [the King] as in fact a Lusitanian, a prestige uncommon to immigrants at the time, as well as for *Taboada Curiosa* to be printed and republished several times throughout Portuguese territory.

The second strategy intended to validate the production of mathematical meanings through the transmission of arithmetic concepts (quantities, calculations and measurements) related to living in society. Understanding that this Portuguese society was composed of different elements of social, economic and political transformation, different conditions may have guaranteed the editorial success of *Taboada Curiosa*. The relevance of the work to its consumer public can derive both from the sales context – in the main schools in Lisbon – and from the speeches expressed in it that exemplify social practices that took place around commerce and mercantile businesses. In more precise terms, it is fitting to say that arithmetic was associated with the need to arithmize the real, that is, to numerically perceive situations in the reality of life:

The arithmetic and mathematization of situations consist of preparing quantified symbolic representations of the real and then operating (following precise rules) on these quantifications, so that the results of the (arithmetic) operations performed on the symbolic representations provide an acceptable approximation (whose desirable

degree of adequacy, beyond that, will have been fixed) of the results that would be effectively obtained by the application in the real of actions corresponding to symbolic transformations (increases, decreases, divisions, etc.) (Fayol, 2010, p. 13).

Ultimately, the ideas of Joam Garrido relativize the teaching of arithmetic from the applicability of what is real to a time period. According to Portuguese researcher António Augusto Almeida, arithmetic books are representative of their time, their pages demonstrate the “problems, solutions, ways of doing things, but all that world and all that time is time and world of men who live, that reflect and act upon it, and by acting they transform” (Almeida, 1994, v. 2, p. 07). In this sense, many of the instructions are methodologies presented for self-instruction in the "art" of "arismetics", which used practical, everyday examples to facilitate understanding/learning and also some elements that should be "decorated", to be memorized, such as the use of various rules.

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