U.PORTO
FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

MASTER IN GRAPHIC DESIGN AND EDITORIAL PROJECTS

INVISIBLE BOOKS:
THE WORLD OF INVISIBLE DESIGN

Study and Analysis of the Editorial Design
in Books for the blind and visually impaired

MARIANA DA SILVA COUTO

SUPERVISOR: PROF. JOAQUIM ANTERO MAGALHÃES FERREIRA

SET 10, PORTO, PORTUGAL 2024

U.PORTO

FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

MASTER IN GRAPHIC DESIGN AND EDITORIAL PROJECTS

INVISIBLE BOOKS:
THE WORLD OF INVISIBLE DESIGN

Study and Analysis of the Editorial Design in Books for the blind and visually impaired

PROJECT REPORT:
MARIANA DA SILVA COUTO

Project Report presented to the Faculty of Fine Arts of the University of Porto to fulfil the requirements necessary to obtain the Master's degree in Graphic Design and Editorial Projects

SUPERVISOR:
PROF. JOAQUIM ANTERO MAGALHÃES FERREIRA

SET 10, PORTO, PORTUGAL 2024

ACKNOWLEDGEMENTS:

I would like to thank professors Antero Ferreira, Pedro Amado, and Cristina Ferreira for their continuous words and guidance throughout the project and their valuable insight during its many structural changes and tribulations.

The APEC Association for accepting my candidature for their “Capacitar à Distância” course, along with many others—far more than initially expected—to offer me more opportunities to learn and hear people I wouldn’t have met otherwise.

My parents for their endless support through everything and their perpetual optimism in the face of numerous obstacles that made me almost give up entirely. My cat was also there.

And my best friends for their warm embrace when I truly needed it, along with all those who have believed in me since the beginning.

I wouldn’t have made it without all of you.
Forever thankful, Mariana Couto

ABSTRACT:

This project explores the field of editorial design for people with visual impairments, cataloguing the sensory expression of books for the blind in history and its technical usage, highlighting where and how it's prevalently used today and where it can still improve and be experimented with to create brand new and interesting sensorial experiences for readers.

Relying on academic research and similar developed projects as a basis, this study envisions a new artefact for readers that is equally interesting for blind and/or deaf individuals, using human senses as a natural bridge to bringing people together, share a common experience and offer a new learning opportunity for those not yet familiar with Braille.

Titled "Invisible Books" this study explores and focuses on the unique strategies and innovations for creating tactile books within editorial design and, through analysis, uncovers what's really needed for a book to be an object of true inclusive design. Emphasising the symbiotic relationship between form and function for multi sensorial exploration within, because Universal Design as a concept should foster accessibility and inclusion, not be just exclusive to those who need it, but also interesting for all around them as well.

KEYWORDS:

• BLIND • VISUALLY IMPAIRED
• EDITORIAL DESIGN • UNIVERSAL DESIGN
• TACTILE BOOKS • INTERACTIVE BOOKS

RESUMO:

Este projeto explora o campo do design editorial para pessoas com deficiência visual, catalogando a expressão sensorial de livros para cegos na história e a sua utilização técnica, destacando onde e como é predominantemente utilizado hoje e onde ainda pode ser melhorado ou experimental para criar novas experiências sensoriais, interessantes para todos os leitores.

Baseando-se em investigações académicas e em projetos desenvolvidos anteriormente, este estudo analisa a criação de um novo artefato para leitores que possa ser igualmente interessante para indivíduos cegos e/ou surdos, utilizando os sentidos humanos como uma ponte natural para aproximar as pessoas, partilhar uma experiência comum e oferecer uma nova oportunidade de aprendizagem para aqueles que ainda não estão familiarizados com o Braille.

“Invisible Books” ou “Livros Invisíveis”, é um estudo que explora e foca-se nas estratégias e inovações únicas para a criação de livros táteis dentro do design editorial e, através da análise, revela o que é realmente necessário para que um livro seja um objeto de verdadeiro design inclusivo. Dando ênfase à relação simbiótica entre forma e função para a exploração multissensorial interna, porque o Design Universal como conceito deve promover acessibilidade e inclusão, não ser apenas exclusivo para quem precise, mas também interessante para quem os rodeia.

PALAVRAS-CHAVE:

• CEGO • DEFICIENTE VISUAL
• DESIGN EDITORIAL • DESIGN UNIVERSAL
• LIVROS TÁTEIS • LIVROS INTERATIVOS

TABLE OF CONTENTS

1. THE INTRODUCTION **13/27**

1.1. DESCRIPTION & CONTEXT **13**

1.2. METHODOLOGY **14**

1.2.1. RESEARCH & DATA 16

1.3. OBJECTIVES & GOALS **18/19**

1.4. STRUCTURE **20**

1.4.1. PREVIOUS WORK & TIMELINE 21

1.5. FRAMEWORK & AUDIENCE **23**

1.5.1. MOTIVATION & RELEVANCE 24

1.5.2. STATISTICS & FACTORS 26

2. THE ARTEFACT **28/59**

2.1. DESCRIPTION **31**

PROJECT & CONCEPT

2.2. TARGET AUDIENCE & READERS **32**

2.3. STYLE & AMBIANCE **34**

2.4. RESEARCH & VALUES **38**

STYLISTIC DECISIONS

2.5. BOOK SIZE & PAPER **40**

2.5.1. OTHER RELIEFS 42

2.6. BINDING **43**

2.7. BRAILLE & PRINTED TEXT **45**

2.8. PAGE STYLE **47**

2.9. FORMAT & PARAGRAPHS **50**

2.10. EDUCATIONAL PHILOSOPHY **52**

2.11. ANALYSIS **54**

2.12. ILLUSTRATION **57**

3. THE CONTEXT **60/72**

3.1. THE WRITER & POET **60**

3.2. THE POEM **65**

3.2.1. ORIGINAL & TRANSLATION 67

4. UNIVERSAL DESIGN **72/73**

4.1. PORTUGAL & INCLUSIVITY **73**

5. THE INDIVIDUALS 74/84
5.1. LEGAL TERMS & ASPECTS 75
5.2. PERCEPTION & LIMITATIONS 76
5.3. READING SPEED & COMPREHENSION 79
5.4. ATTITUDE & HABITS 82

6. BLIND HISTORY 85/90
6.1. BLINDNESS CONTEXT (PORTUGAL) 89

7. EDITORIAL HISTORY FOR THE BLIND 91/109
BLIND WRITING AND EDITORIAL SYSTEMS
7.1. ANCIENT WRITING, B.C.E. 93
7.2. FRANCE, 1785 94
7.3. ARBITRARY SYSTEMS 96
7.4. LUCAS AND MOON SYSTEMS 97
7.5. BRAILLE 98
7.5.1. NIGHT WRITING 99
7.5. BRAILLE (PART 2) 100
7.6. DECAPOINT & RAPHIGRAPHY 102
7.7. TACTILE ALPHABETS & INDUSTRIAL PRINTING 103
7.8. TYPE MACHINES & TYPEWRITERS 104
7.9. SPOKEN BOOKS AND AUDIOBOOKS 105
7.10. MODERN BRAILLE TECHNOLOGY & TOOLS 106
7.11. HISTORICAL RECORDS & PRESERVATION 109

8. MARKETS & INFLUENCES (PORTUGAL) 110/120
8.1. LOCAL BLIND PRESS 113
8.2. THE FUTURE OF BRAILLE 116
8.3. AVAILABILITY & PUBLIC 118

9. CONCLUSION & FUTURE PROSPECTS 121

BIBLIOGRAPHY 123/131
CITATIONS & TRANSLATIONS 134/139
IMAGES 141/146
BOOK PROJECT 157/252
BOOK COVERS 148/155
APPENDIX 255/273
COLOPHON 274

PREFACE

This thesis adheres to the guidelines set forth by the **American Psychological Association (APA), 7th edition**. British English is used throughout the document to maintain linguistic consistency.

Where necessary, translations have been completed by the student to facilitate the understanding of non-English sources. The original texts of all translated materials have been included in the bibliography for reference and transparency.

1. THE INTRODUCTION

1.1. DESCRIPTION & CONTEXT

This project relies on the planning of a single physical object with strong tactile characteristics directed towards all readers but with special attention towards readers with visual or auditory impediments.

All readers are able to experience the work in a similar yet strong way without being restricted by their inability to hear or see and have the time and atmosphere to discuss the work in a diegetic and natural way with the aspects that speak more towards them reflecting the narrative being told as a whole.

It's an adaptation of an already-written work, yet not adapted to this medium, mainly focused on giving it a new context without changing its core values or nature, as the main focus and drive of the project is to give a quick first introduction to the subject in a valid, non-intrusive way. And consequently start off a current yet important discussion about editorial design in books for the blind, instead of having its focus already associated with these impediments in the first place, offering itself as a vehicle for reevaluation and as a means of experimentation.

Its planning, process and analysis are featured in the study, along with the research that complements the main topics of interest. Presenting it as a case study about universal design, targeted specifically towards editorial design, and as a means to create a direct connection between people with these sensorial impediments and the general public at large.

1.2. METHODOLOGY

The nature of the work is both applied and mixed, simultaneously worked on, contextually for the written thesis and physically for the sensorial artefact and its medium of study.

The written text delves in detail about its historical and societal importance, presents its many sensorial facets and analyses the expected audience reception, while also working in direct connection to the construction of the tactile editorial prototype, highlighting all the factors taken into account for its preparation.

The research is both focused on, in equal part, quantitative and qualitative research depending on what's needed to justify its use in correlation to the artefact and environment, as it retains to both objective and subjective study subjects in relation to both communication, design and the disabled human experience.

The historical and conceptual study focuses more heavily on quantitative research to justify its inclusion and relevance, but also occasionally delves into qualitative research when dealing with discussions, for example, about certain sensorial subjects and specific audience interpretations of other similar analysed external works.

Construction and its later graphical analysis, of the artefact by itself, favours a more qualitative research in direct correlation to the written material, selected by its main theme of narrative, but it's once again structurally aided by what was collected in the quantitative part of the research for its expected reception in the final result.

All research collected is justified with the inclusion and analysis of already certified and pertinent case studies or scientific experiments that were proven to work effectively, or were well received, in the same subjects this project is aiming to achieve. It will also take into consideration personal accounts of certified specialists or people with visual impairments themselves, that might bring to question relevant topics of discussion or put into words more nuanced discussions.

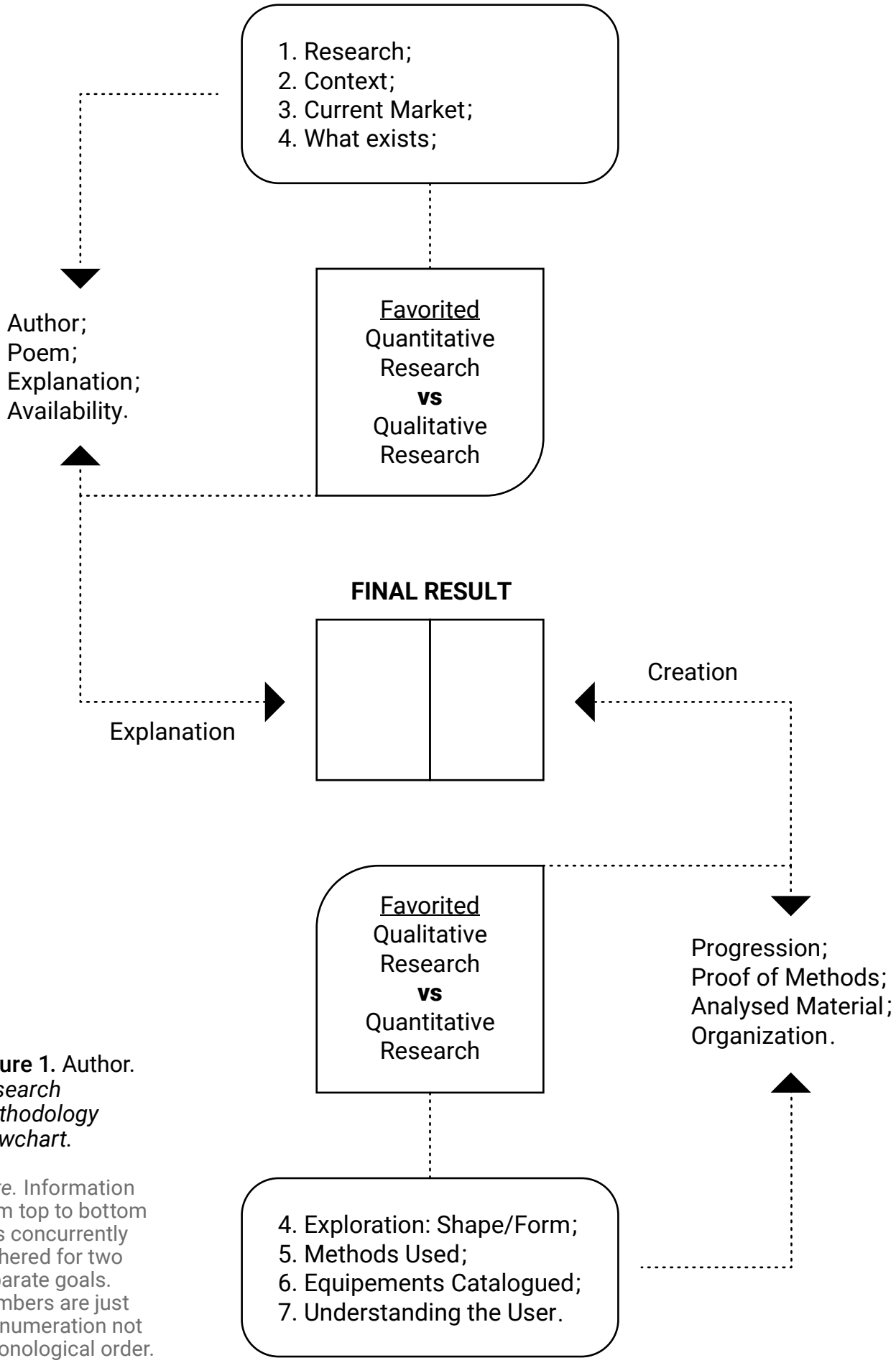


Figure 1. Author. *Research Methodology Flowchart*.

Note. Information from top to bottom was concurrently gathered for two separate goals. Numbers are just for numeration not chronological order.

Due to the expansive level of possible participants in question, in this case all readers including people that have an advanced degree of blindness or possess a visual impairment, this study favours local and national specific case studies, backed up by local professionals and specialists in the area. Global scientific experiments are only considered when retaining to the medical condition and/or sensorial study by itself, being completely devoid of a specific motivation and/or personal agendas.

All research is related to what appears directly on the project experience and artefact, as a means to not extend the research too broadly or generally. But can sometimes touch, when relevant, on things outside of its main focus, for example to justify its inclusion in the final result or contextualise its true function in the project.

1.2.1. RESEARCH & DATA

The study primarily touches on blindness as a global condition, with special attention towards Portugal as the main local focus group. All information collected is based on scientific studies and certified experimentation by credible international or local sources.

During the creation of the thesis, the student worked closely on an asynchronous[1] online course created by the Association for Promoting Education for the Blind (APEC*). The online course itself, *Capacitar à Distância**, started on May 1st 2024, having its completion scheduled for December of the same year.

[1]**Asynchronous**: involving students working separately at different times, for example using recorded lessons or the internet, rather than involving students and teacher taking part in a lesson all at the same time.

Peters, P. (2014). *The Cambridge dictionary of English grammar Cambridge University Press, Cop.*

***APEC**, Associação Promotora do Ensino dos Cegos, in portuguese.

***Capacitate at a Distance,** in english.

Figure 2. APEC. (2023). *APEC Logo.*

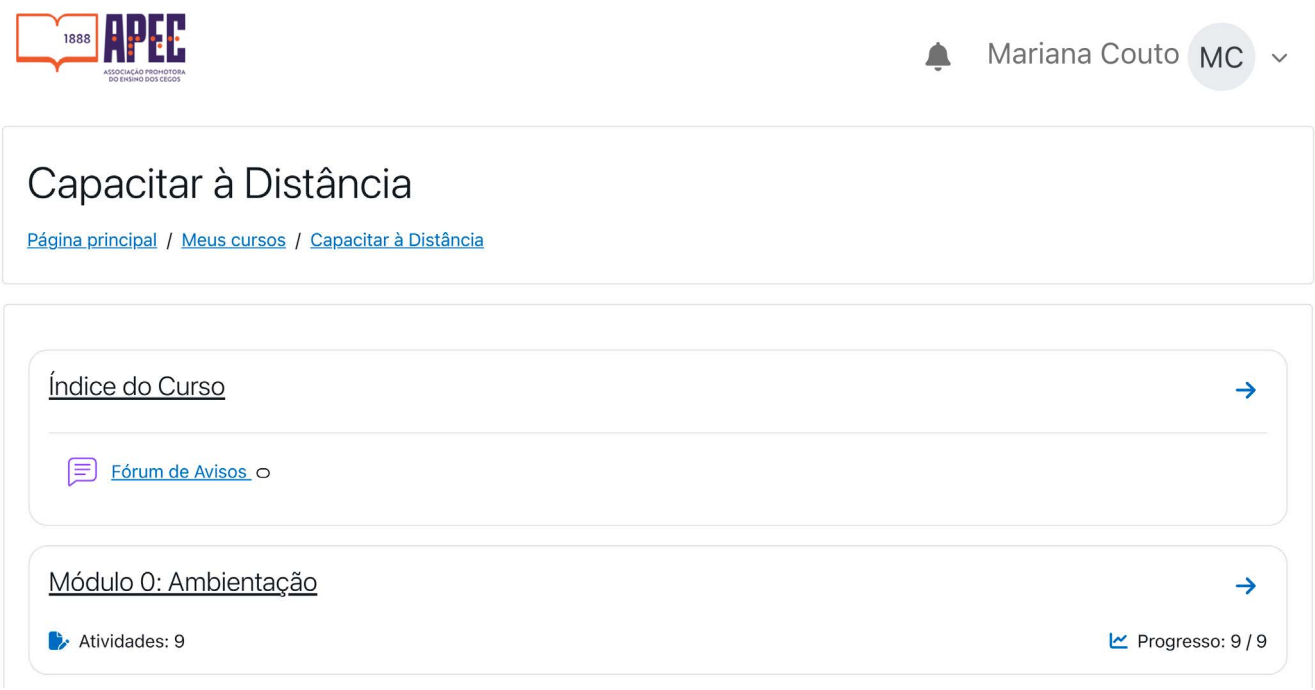


Figure 3. APEC. (2024). *APEC Virtual Learning Environment*. [Website] In APEC Moodle.

*__FBAUP__, Faculdade de Belas-Artes da Universidade do Porto, in portuguese.

While not being formally necessary for the completion of the project, or associated in any legal or educational way to FBAUP*, this resource proved to be invaluable as an additional source of information and was treated as a compliment when relevant to sample from. It aided the research and project by having its primary citations and videos always available for consultation as well as in providing a means of communication with specialised people in the form of teachers, technicians and other students that were in turn diagnosed with visual impairments themselves or were professionally working with people that had them.

COURSE ASSOCIATES
(TEACHERS, TECHNICIANS, OTHERS):

Coordinator: Rui do Nascimento;
Orientation and Mobility Technicians:
Cristina Almeida, Sara Leal, Carla Santiago;
Braille Technician: Fernando Costa;
Psychologist: Sílvia Alemão;
ICT Technicians: Norberto Sousa, Wagner Maia;
Sociocultural Recreationist: Marta Bastos;
Rehabilitation Assistant Technician: Rafael Melim;
Marketing, Communication and Public Relations Technician: Carina Almeida.

All information that couldn't be confirmed by certified people or proven by research materials in regard to uncertain aspects and details of the project in question was reviewed by the student in collaboration with the APEC Association and its specialised personnel.

1.3. OBJECTIVES & GOALS

- Create a controlled sensorial book for all readers with the basis of being accessible to everyone regardless of physical impediment;
- Catalogue and present the historical records of editorial design for the blind or visually impaired, as well as its relevance and importance to our society;
- Give an overview of the current market and the struggles one finds when creating something for the blind or visually impaired;

Figure 4. Miroshnichenko, T. (2021). *Close-Up Shot of Hands on a Braille Book* [Photograph].

- Touch on critical concepts and guidelines to keep in mind when creating a physical object for the blind, like Braille;
- Analyse relevant examples of editorial design for the blind already created with the purpose of educational, recreational, or individual use;
- Explore the senses, specifically the tactile and auditory senses, as a tool for communication, and reflect on Universal Design as a concept and its exploration as a means for connection.

1.4. STRUCTURE

The written thesis is divided in 3 major parts:

1. The internal structure of the written thesis begins with a thorough explanation of the conceptual prototype. This includes its context, framework, focus audience, objectives, methodology used and its true relevance for the study in question. Opening the project wide open starts interest in the subject discussed, providing its own artefact as a physical embodiment of what it's trying to defend, and leading to curiosity about the study more thoroughly. It will not feature all pages immediately, but provide a strong starting point to talk about its background.

All writing material collected by the student in association with the APEC online course will be featured and explained, when relevant to the topic in question, as a means to provide validation to the claims and present in its construction.

2. After that first introduction the study provides the necessary context as a whole and a quick historical research relevant to understand its impact, followed by a quick record on editorial techniques used for the blind, it's use throughout the centuries and to the modern day, descriptions of concepts that are directly linked to the project, like for example Universal Design. Giving the first true introduction to the research segment as a means to provide context to the creative decisions made.

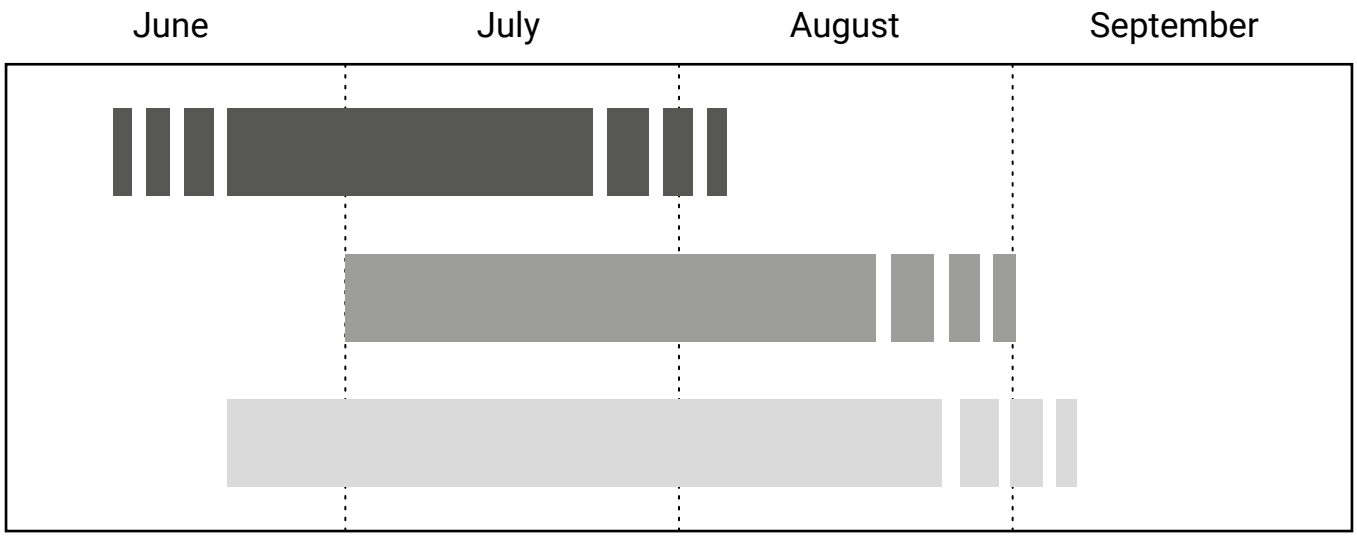
3. The last segment, using all previous parts combined, provides and describes its contents in a direct way, providing its necessary photo evidence. For a reader already familiar with its conceptual nature and historical research, it's completely possible to jump directly to the photo portion to see it fully completed and constructed. Annexes will also be featured after all other material is explained and presented.

1.4.1. PREVIOUS WORK & TIMELINE

Work for this project officially started in June of 2024 and was officially approved by FBAUP on the 26 of June 2024. Due to external circunstances, and by the previous approved internship ending, having been delayed and later cancelled prematurely, the previous research became unusable as it was based on the creation of an object that wouldn't be realised anymore.

Some material was saved from this partnership and modified accordingly to the means it would be most beneficial in its current form. No reference of this internship appears on the final written material as it was never approved for this research in particular. Work was concluded by the start of September, of the same year, where it was approved for its evaluation.

Approximate Timeline



Start: 21 June

End (Submission)**:** 13 September

Jun./Aug. Global/Audience/Market Information

Jul./Aug. Artefact Plannification and Context

Jun./Set. Thesis, Analysis & Other Materials

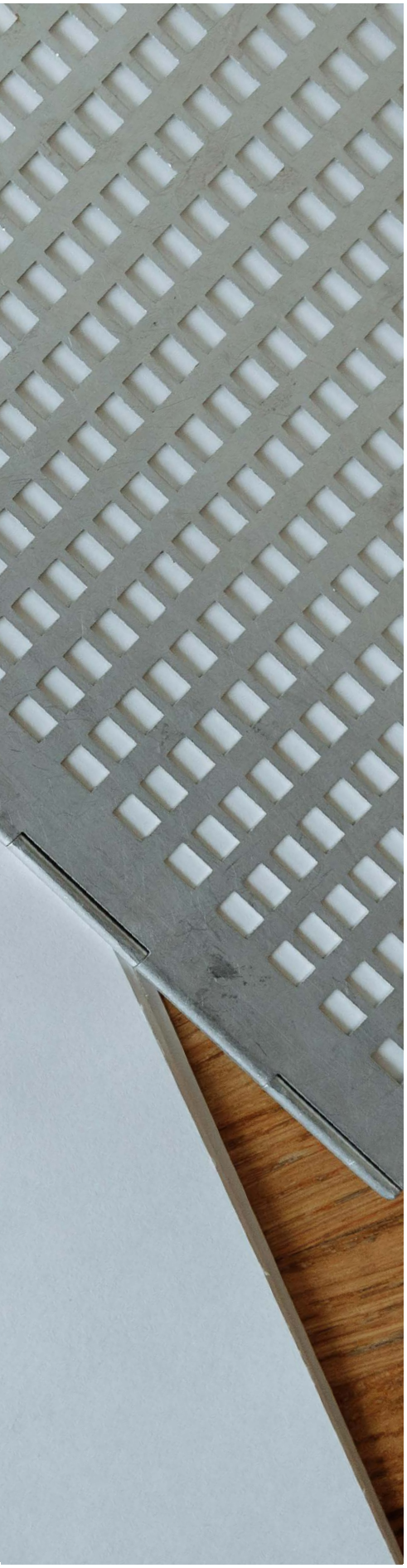
Part.1 - Research & Collection

Part.2 - Object & Construction

Part.3 - Compilation & Results

Figure 5. Author. *Approximate Timeline*.

Note. Research started by June 10 and was worked on in unison with the artefact until August.



1.5 FRAMEWORK & AUDIENCE

This project targets primarily an adult and/or early elderly audience, being possible to adapt in other pretexts towards a more younger audience in the future. It's mainly treated as an experimentation, fully open for changes and adaptations even after its full completion, having its basic research covered by the study along with the necessary details provided for its creation.

The study doesn't feature any research related to any intellectual impediments that might come from an advanced physical condition or further explanations of its auditory field apart from what might appear in the final artefact, using it merely as a means of connection between a new audience and its engagement with the object itself. All of the analysed material featured in the study is in direct correlation to what appears in the final editorial result and what it's necessary to explain its significance and justify its use.

The artefact is created with recreational and social purposes in mind with an educational core, with its primary author being a renowned blind poet—the writer António Feliciano de Castilho—and it will work as a direct sensorial connection for readers. The necessary explanation and analysis of the pages of the prototype along with its preparation is provided along with evidence on the final research material.

Figure 6. Thirdman. (2021). *Pages with Braille Text* [Photograph].

1.5.1. MOTIVATION & RELEVANCE

The rate at which visually impaired and blind individuals are able to autonomously and safely use the same spaces and tools as the general public has been drastically increasing[2] in recent times, thanks to the growing interest and subsequent need for a more universal and inclusive design in the contemporary age.

This increase can be attributed to several factors, such as the sequential advancement of technology, science, and cultural progress when it comes to breaking social barriers and taboos. The optimisation of trivial everyday tasks and the diversification of offered services. The big change of focus in the global market, and current capitalistic landscape, to the international buyer and broader population at large, among others[3].

These factors are not often limited to or restricted to any specific continent or country; they are observed globally at varying rates depending on the region being analysed. Ultimately, these are just byproducts of human evolution and adaptability.

It's reasonable to assume that with all advancements, markets eventually target previously untapped or hard-to-reach audiences to diversify and increase their earnings, especially since many of these adaptations can also benefit the general public. Guides for the visually impaired in particular[4] are interesting as they often rely on alternative communication methods, primarily based on touch and sound. Senses that have been proven to be particularly engaging for newer generations, who also have for example, been relying more and more on them for engaging education[5] and daily entertainment[6].

But are we truly utilising these adaptations to their full potential? It's undeniable that society has come a long way in providing accessibility and aid to those that truly need it. We have living proof of this in the many blind individuals we share our communal spaces with. But does that make us truly understand them at their own level, or are we just making that difference unnoticeable in our own lives?

[2] Evidence Map. (2019). *Disability Employment - Evidence Map*.

[3] Bendt, F., & Skropska, M. (2008). The Relationship between Foreign Market Expansion Strategies and Foreign Market Entry Strategies for SMEs.

[4] Nicolau, Hugo & Guerreiro, Tiago & Jorge, Joaquim. (2009). Designing Guides for Blind People.

[5] TEQ. (2003). *Research Review of Sound Enhanced Classroom Technology*.

[6] OFcom. (2023). *Children and Parents: Media Use and Attitudes*.

Some designers, like Jared Spool, defend that "Good design, when it's done well, becomes invisible. It's only when it's done poorly that we notice it."[7].

But the truth is human beings can't properly relate to something they don't fully understand without adapting it with some level of personal equivalency[8]. The first natural instinct a empathetic human faces when we're speaking about blindness is to question how having that impairment would badly reflect in one's own life, and that is true with many similar cases like illnesses, disabilities or physical and mental impairment of any kind.

Turning something invisible might be good for immediate integration, but in the long run, it might prove to be something alienating or even intimidating[9] to someone who might be forced to integrate later in life, like for example an older person experiencing sight loss with age, without prior strong positive external factors[10].

It's also important to keep in mind that blind individuals possess their own systems and means of reading, proven time and time again to be pretty efficient, but aren't as commonly used by people that don't require its frequent use, making them a certain level of conditional to a determined number of people that might've been born with the condition, were gradual in it's integration, or were already fully integrated within blind-friendly environments.

There is an implied bridge that needs to be created after spreading and maintaining true invisible design, so that dialogue can still be exchanged in an equivalent manner between all people equally. Without being both overwhelming or intrusive to uninformed readers while also being interesting to blind individuals on a conceptual level. This project's main motivation is to create that bridge in a natural way without compromising any reader, while also providing something they can all relate to on a multisensorial level, independent of the impairment or disability one might have.

A project that can be interesting to share with anyone for its multitude of factors and maybe even inspire to replicate—be it with different themes, subjects or in other forms of media.

[7] FBTB. (2022, June 15). *FBTB22: Jared Spool – What Got UX Here Won't Get UX There*.

[8] Sharma, N., Pratap Yadav, V., & Sharma, A. (2021). Attitudes and empathy of youth towards physically disabled persons.

[9] RNIB. (2022, June). *Starting Out Series – Emotional Support*. RNIB.

[10] Fredrickson, B. (2001). *The Role of Positive Emotions in Positive Psychology. The Broaden-and-Build Theory of Positive Emotions*. The American Psychologist, 56(3), 218–226.

1.5.2. STATISTICS & FACTORS

It's estimated by the International Agency for the Prevention of Blindness (IAPB), in its latest 2020 Vision Atlas report[11], that almost 600 million people live with some sort of vision impairment or disability in the world, 295 million of those cases being moderate-to-severe visual impairment and 43 million being completely blind. That counts for approximately 7.6% of the entire global population in 2020 alone, representing a more optimistic number compared to the predicted by the World Health Organization back in 2013 of almost 9%[12], but still equates to a big portion of the population that for all intents and purposes requires special attention and criteria when using or buying something for it to be deemed accessible in its entirety.

[11] IAPB. (2020). *The International Agency for the Prevention of Blindness. Causes of Vision Loss.*

[12] World Health Organisation. (2013). *Global action plan for the prevention and control of noncommunicable diseases 2013-2020.*

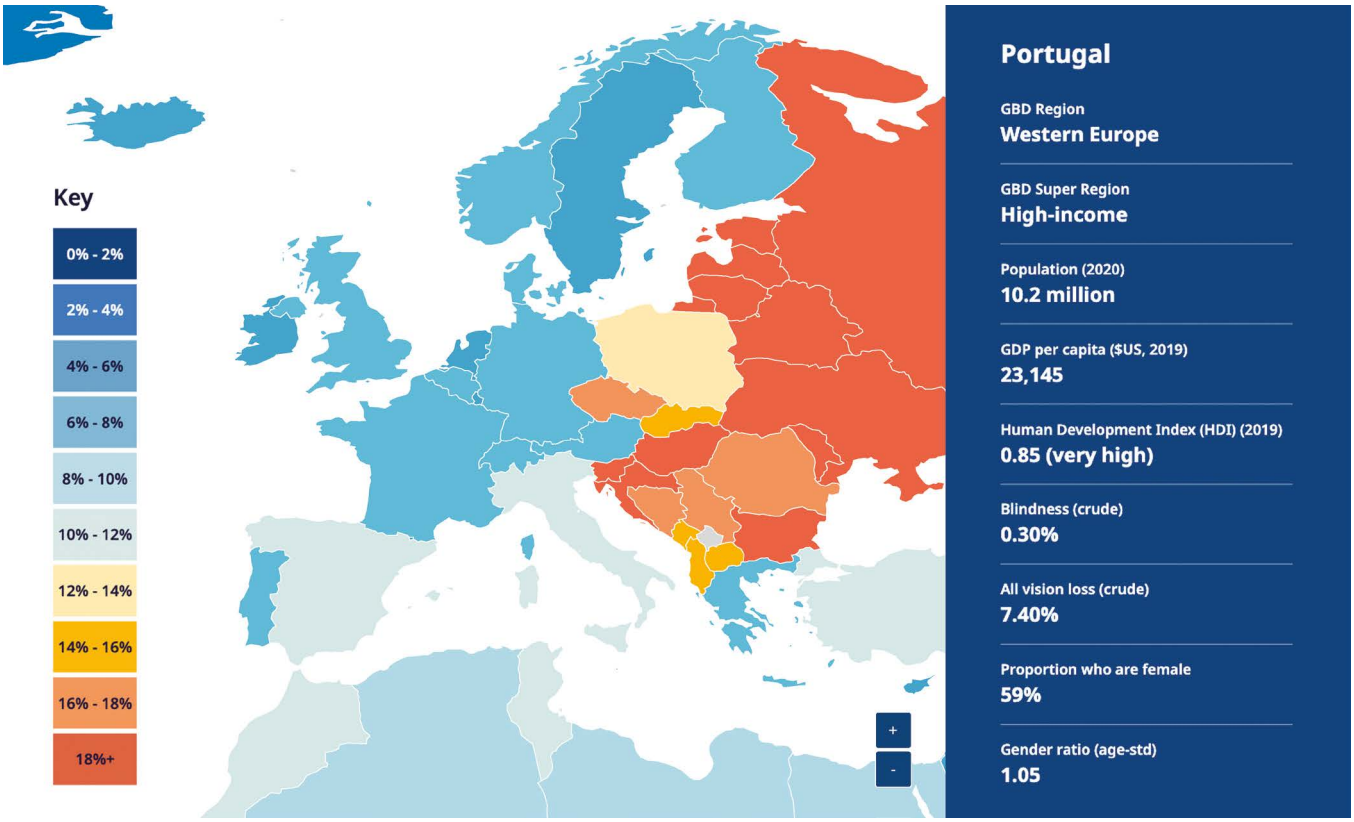


Figure 7. IAPB. (2020). *Portugal: Country Map & Estimates of Vision Loss.*

IN PORTUGAL

"In 2020 (...) there were an estimated 780,000 people with vision loss. Of these, 33,000 people were blind."[13] Says IAPB in regards to Portugal, a number not very far off from the 900,000 and 28,000 respectively of the 2011 Portugal Census collected by the ACAPO Association[14].

[13] IAPB. *The International Agency for the Prevention of Blindness. Country (Portugal).*

[14] ACAPO. (2011). Associação Dos Cegos E Amblíopes de Portugal. Deficiência visual.

This is more relevant than ever for designers and visual artists because by IAPB projections[15] there will be a significant increase of this percentage by 55% in people that suffer some sort of vision loss by 2050. These changes are natural in origin and are a result of expected population growth in contrast to the fast ageing current global population. But even with this in mind, the current module being used according to specialists doesn't show signs of improvement[16] in the recent decades especially in countries of low income.

According to eurostat, Portugal ranks 2º highest in countries with a population above 44 years old in Europe[17], and with the recent increase of emigration rates throughout Europe, this number has the probability to increase in the next few years[18].

With that big of a portion in our national demographic now older, there is the expected increase of developing a visual decline or even loss due to age, so this experience might be interesting to keep in mind for this public in particular.

It might be more relevant now than ever to start building this bridge so it spreads naturally and reaches anyone that might use it in the future. Providing both a first introduction, especially for those who don't normally have contact with the subject, while also being an interesting way to bring attention and connect to already integrated blind individuals in the public discussion about editorial design, opening this concept towards new experiences in the future.

[15] IAPB. (2020). *Projected Change in Vision Loss 2020 to 2050*.

[16] World Health Organisation. (2013). *Global action plan for the prevention and control of noncommunicable diseases 2013-2020*.

[17] Eurostat. (2020). *Population structure and ageing - Statistics Explained*.

[18] Instituto Nacional de Estatística. (2022). *Estatísticas demográficas: 2022*.

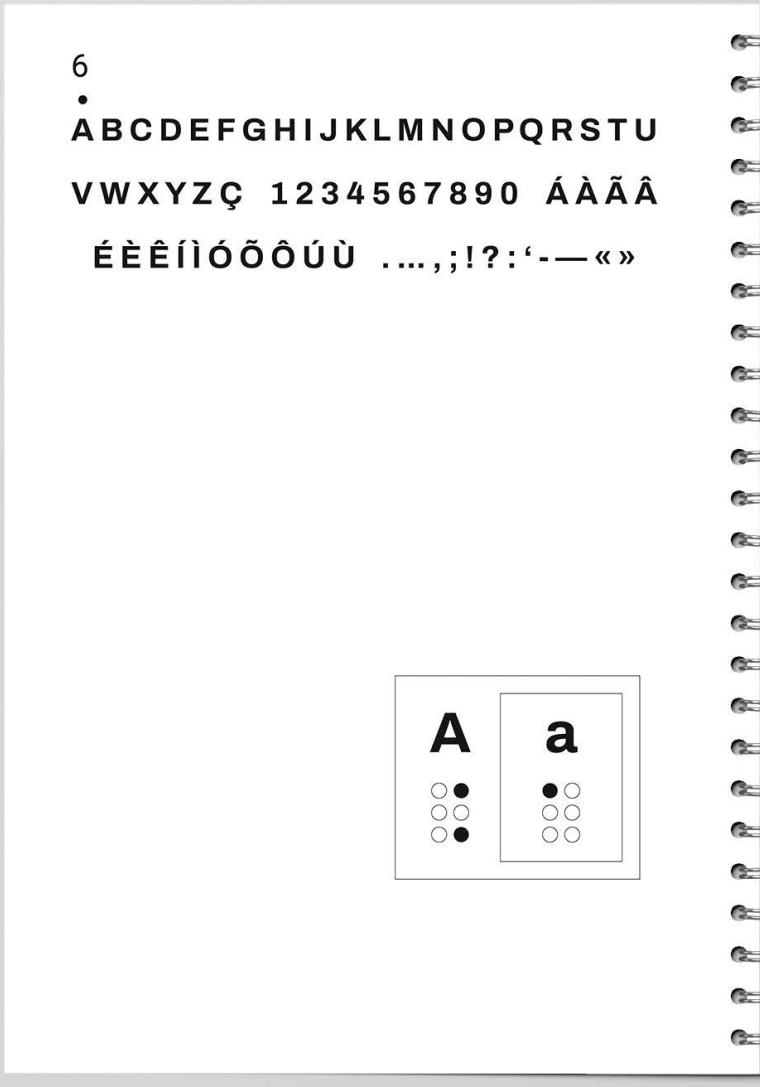
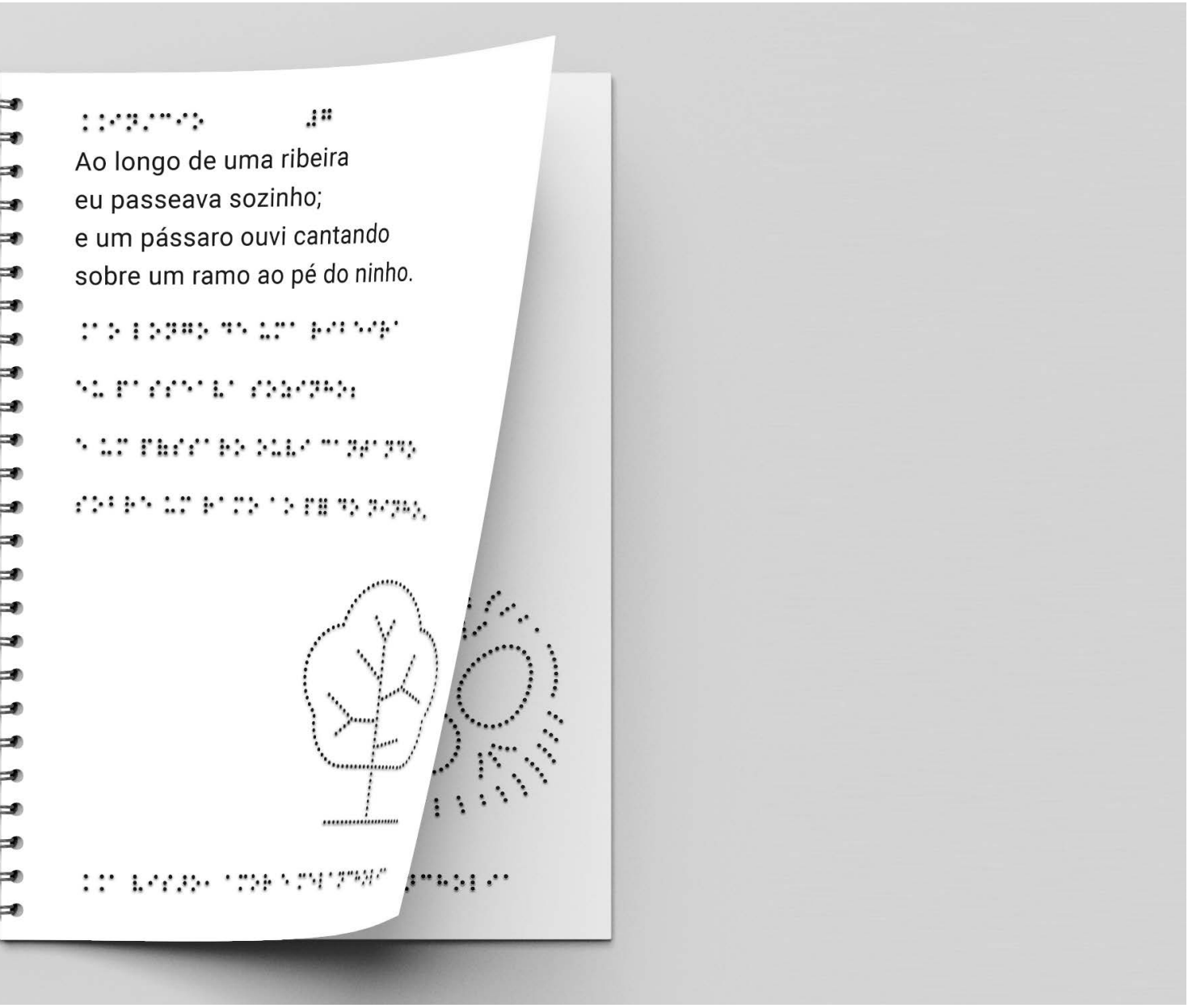


Figure 8. Mockups Design. (2020, October). *Binded Book Mockup.*

2. THE ARTEFACT A



SHORTCUTS

Shortcuts to research materials and studies will be available from now on throughout the text for easier navigation:

EXAMPLE:

> Return to “2. THE ARTEFACT” after viewing this text is now possible if you press the button directly on its side like this example, a similar button will be mirrored in its corresponding section to return here.

2.1. DESCRIPTION

A4 Poetry dual-reading book, preferably idealized in high-grammage paper (120 to 150gsm), uncoated, suitable for embossing and black-and-white or monochrome printing. Printed text in Portuguese, featuring Level 1 braille with simplified alphabet, punctuation, and practical examples.

Adaptation of *"A Visão"* ("The Vision") by António Feliciano de Castilho from *Amor e Melancholia* (1828), based on the 1861 edition, with illustrations made by the student. Created as experimentation and proof of format for poetry verses and/or small format text.

Designed for single-sided braille and relief printing, compatible with hardcover, paperback, and wire binding. Text is enlarged with ample spacing for improved readability for the elderly, blind, and/or visually impaired.

Original Title	**ENG Translation**	**Language**	**Braille**
A VISÃO: Amor e Melancolia, 1861	THE VISION: Love and Melancholy, 1861	Portuguese	Grade 1

Book Type	**Author**	**Target Audience**	**Specialized**
Poetry and Educational	António Feliciano de Castilho	Adults (18 to 65+)	Elderly, Blind and/or deaf

Project Type	**Colours**	**Paper**	**Page nº**
Conceptualization /Mockup	Black and White or Monochrome	A4 (210 x 297mm / 8.27 x 11.7 inches)	96 (Optional Cover)

2.2. TARGET AUDIENCE & READERS

This book is designed for adults aged 18 to 65 and beyond, with a particular emphasis on older individuals with newly experiencing changes in their vision. Many books cater to either just sighted or visually impaired readers but this dual-reading format aims to bridge that gap, offering both traditional enlarged printed text and braille in a single volume for dual reading purposes in a low cost format.

1

For older adults, learning braille or even reading past a certain age can often seem daunting. However, this book provides an accessible introduction to braille through a diegetic experience where the braille parallels the text in its entirety.

As readers engage with the poetry, they will encounter the braille alongside the text, offering a unique opportunity to familiarize themselves with it naturally. By introducing braille in a simplified manner, readers—whether elderly, visually impaired, or simply curious—can start to learn and recognize the alphabet, numbers and basic punctuation without feeling solemnly restricted to a book for its own educational purposes.

2

This approach also benefits sighted readers who may not initially consider the value of braille. By including both the poem and its braille translation, this book creates an inclusive reading experience that emphasizes the engaging versatility of dual-format publications in poetry and literature in general.

This is an independent, self-referential project that tries to unite both the normal and braille market, providing an idealized small scale project to easily introduce to close family members, nursing homes or local public libraries with the final goal of incentivizing curiosity and discussion for these types of books.

Figure 9. Freepik. (2021)
Top view of notebooks on table.

2.3. STYLE & AMBIANCE

"The Vision" is a romantic portuguese poem of the nineteenth century with its origins heavily based on its blind author's life story. It was chosen for its heavily descriptive nature that assisted the very natural illustrated narrative while also presenting an opportunity to read a lesser-known work that was yet to be translated into braille on the Portuguese national libraries.

3

This Conceptual book was created for a printer/embosser friendly environment. The interior is organized to not conflict with readability but also replicate a conventional or even classic poetry book while having most of its decoration on the optional cover or front/opening pages. Illustrations were made to resemble a more classic style of objects and based on historical influence to participate in its language and overall ambiance.

Its visual appeal is primarily to incentivize a new reader to possibly pick it up, introducing the concept instantly and hopefully inspiring future adaptations or book searching with these parameters in mind, not just for the isolated benefit of a blind individual, who might only be interested in the written portion of the book alone.

In its interactivity with the reader, the book creates a simple but friendly environment to personally, and in the reader's own time, start learning the Braille alphabet, numbers and punctuation: Incentivizing future healthy reading habits or similar experiences being made while also broadening the catalog of translated works that might not be as prominent on the portuguese national market or libraries.

4

A well-lit, quiet, and comfortable room would provide the ideal reading experience for helping the reader to truly focus. Explanations, editorial details, and examples are kept brief to quickly engage the reader with the content and ensure the book is compact, avoiding a lengthy or tedious read. It remains useful for future reference and can also serve as an incentive to share and partake with others.

Figure 10. Author. *Hardcover/Paperback Optional Book Covers (White, Green, Red and Black).*

Vibrant and/or opposing colors are advised if truly necessary for readability, and for some alternate cover designs, but also to target an eye catching adult audience for its memorability and uniqueness. Certain shades of Green, Black and White are also advised for being Colorblind friendly but this is entirely optional and not necessary.

1 "Rio" ou "Arvore"
2 "Ninho"
3 "Passáros"
4 "Vento"
9 "Sino"
10 "Cão"
11 "Agua"
12 "Lua"
17 "Astro"
18 "Fogo"
19 "Raio"
20 "pinhais"
25 "Sino"
26 "Cantar"
27 "Alma"
28 "Coluna"

Figure 11. Author. *Page Planning, Keywords and Illustrations. (part.1).*

2.4. RESEARCH & VALUES

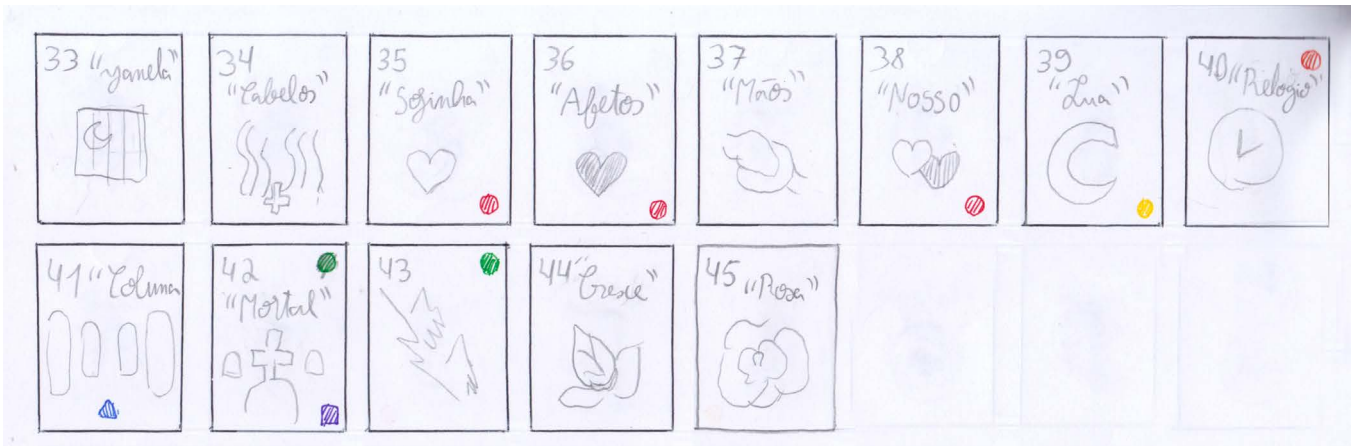
The final result is intended to be seen more as a research reference than for its detailed practical evolution, as certain guidelines could not be avoided due to the nature of its target audience. All relevant research data was collected and incorporated for practical analysis or as appendixes.

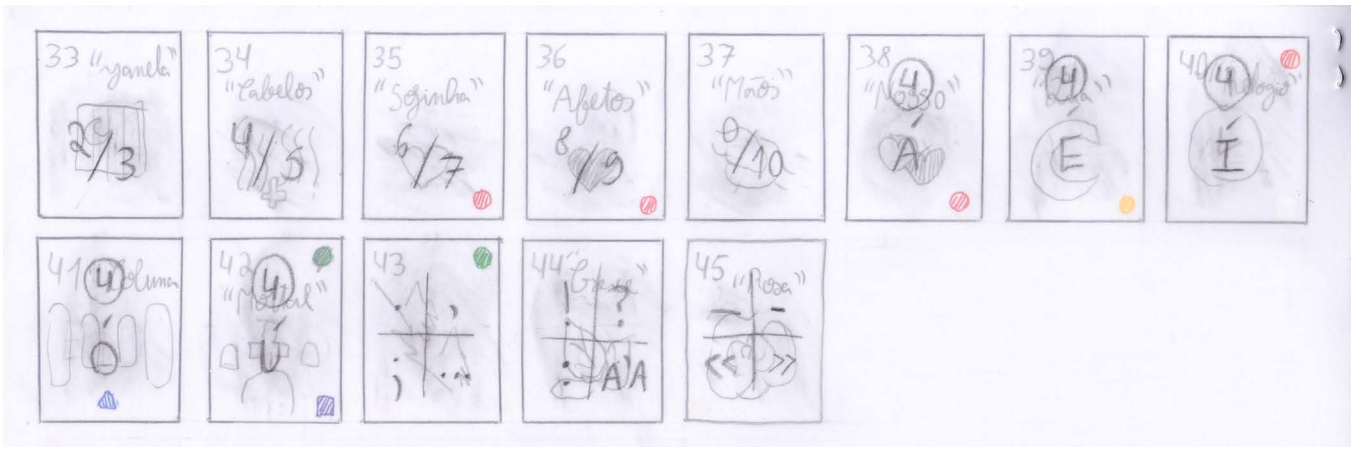
While minor changes took place during its construction, more effort was made to catalog why these changes took place in the first place. Its evolution started by the analysis and replication of already existing works and styles that were modified according to the needs of a particular audience as well as the incorporation and understanding of its subject material and the environment surrounding it.

This in unison with note taking and planification made small changes through the project almost unnoticeable, casual discussions with professors and students from the course made some issues and improvements apparent but were naturally incorporated in its final form. The next section will go into details about these changes and practical characteristics.

Figure 12. Author. *Page Planning, Keywords and Illustrations (part.2).*

Note. Parchment paper was used for annotations and for a full project overview.


33 "janela"
34 "Cabelos"
35 "Sozinha"
36 "Afetos"
37 "Mãos"
38 "Nosso"
39 "Lua"
40 "Relógio"
41 "Coluna"
42 "Mortal"
43
44 "Cresce"
45 "Rosa"


33 "janela"
34 "Cabelos"
35 "Sozinha"
36 "Afetos"
37 "Mãos"
38 "Nosso"
39 "Lua"
40 "Relógio"
41 "Coluna"
42 "Mortal"
43
44 "Cresce"
45 "Rosa"

1 "Rio" ou "Árvore"
2 "Ninho"
3 "Pássaros"
4 "Vento"
5 "Viagem"
6 "Comer"
7 "Sol"
8 "Orelhas"
9 "Sino"
10 "Dão"
11 "Água"
12 "Boca"
13 "Barco"
14 "Música"
15 "Noite"
16 "Deserto"
17 "Anjo"
18 "Fogo"
19 "Raio"
20 "pinhais"
21 "Mãos"
22 "PASSO"
23 "MOCHO"
24 "Relógio"
25 "Sino"
26 "Cantar"
27 "Alma"
28 "Coluna"
29 "Porta"
30 "Lareira"
31 "Relógio"
32 "Dormitório"

2.5. BOOK SIZE & PAPER

This book, in particular, was idealized for vertical A4 due to its phrase/word dimensions and accessible printing convenience—as A4 format embossing machines in Portugal are more common and used more frequently—being also more convenient to type-write or manually emboss if necessary, with possible assistance from a helper with a conventional “ink” printer.

5

Availability was key as there’s a distinct lack of dual reading books in comparison to both extremes of the spectrum—Printed books vs Braille books—so having an option most people were familiar and comfortable with would always be more efficient.

Braille paper comes in various thicknesses and qualities. Standard Braille paper is thicker and more durable than regular paper, ranging from 90 to 160 GSM (grams per square meter), this is to maintain their shape without tearing or flattening, but there are also lightweight options for single-use documents, which are less durable but more accessible.

For this book in particular it is recommended 120 GSM upwards.

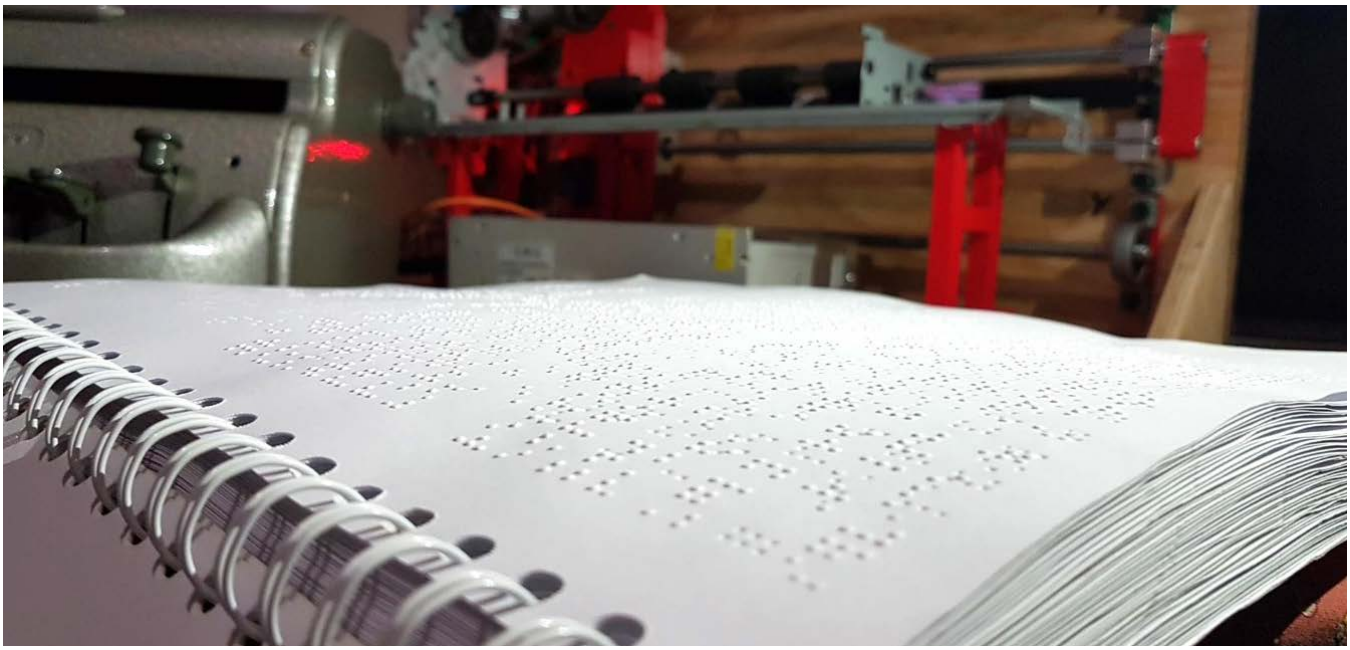


Figure 13. Campos, C. (2018). *DIY Braille Embosser* [Photograph].

Embossing creates raised areas on the paper, while **Debossing** creates sunken areas.

Embossing Styles for **Braille** come in two forms: **single-sided** embossing (interpoint) creating dots on one side and **double-sided** embossing (duplex) that prints on both sides to save space. Nowadays dots variation can be more customized based on the user needs, it can emboss higher dots for easier readability or lower dots for less prominence. This book in particular took into account some space for customization while using the standard size.

Since there's no real need to save space, as there's not a big quantity of Braille, **Interpoint** or **single-sided embossing** is enough for this experience. It's also a lot easier and direct of a process because there's no need to overlap Braille on paper.

The hard/paperback cover, while also designed, is entirely optional. This is due primarily to Portugal using wire binding more prevalently than other methods when it comes to single-sided braille embossing.

Double-sided embossing uses the negative space created by the blank spaces on the paper after the first embossment. It's not entirely parallel, having just a slight margin diagonally.

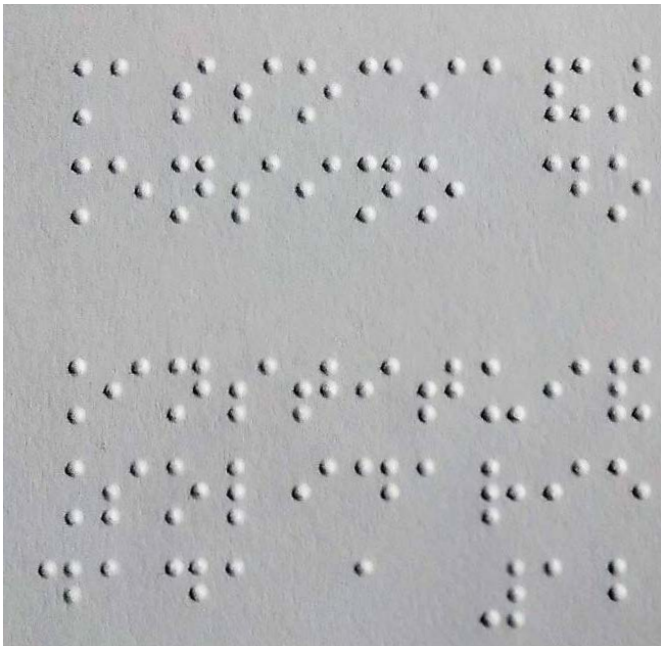


Figure 14. Associação Promotora do Ensino dos Cegos. (2018). *Single-sided Embossing (Interpoint)* [Photograph].

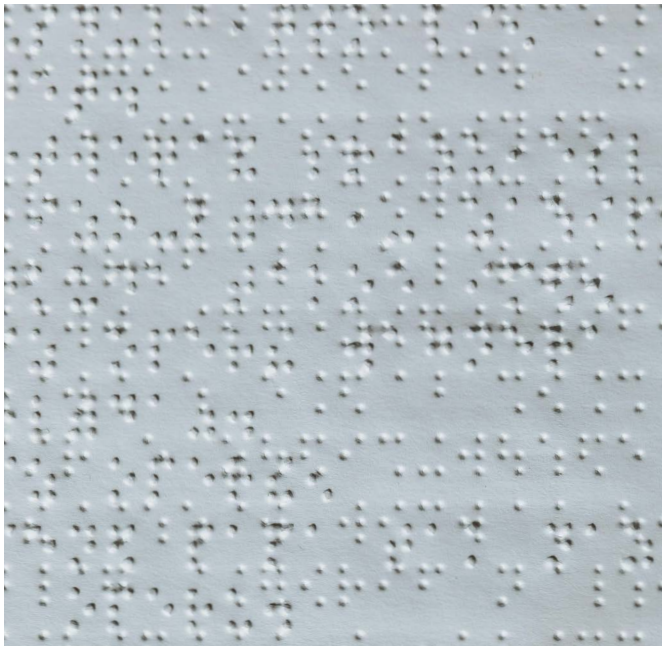


Figure 15. Thirdman. (2021). *Double-sided Embossing (Duplex)* [Photograph].

2.5.1. OTHER RELIEFS

Microcapsule Paper (more commonly known as **Swell Touch Paper**) is a paper that could be used in unison with Braille on the printed text, but due to the way the relief is created, it would require its own specialized machine. Buying a common full box of A4 Swell Touch paper would harbor 100 sheets so it's completely possible to experiment with this book, being under 96 pages.

While **high-reliefs**, like **collage** or **mixed media relief** and **layered paper**, is possible to use in the artifact corresponding to the designated areas, but it's disencourage the use of **low-reliefs** like cutting portions or sinking letters to not affect other pages (every spread is limited to itself and shouldn't be affected by neighboring pages). It's also not a good idea to mix these two for an object of dual readability as it often surprises or even confuses blind readers in the search of words.

Any relief a reader might want to include in the book outside of its designated areas is disencourage as it could inadvertently affect the overall Braille and readability.

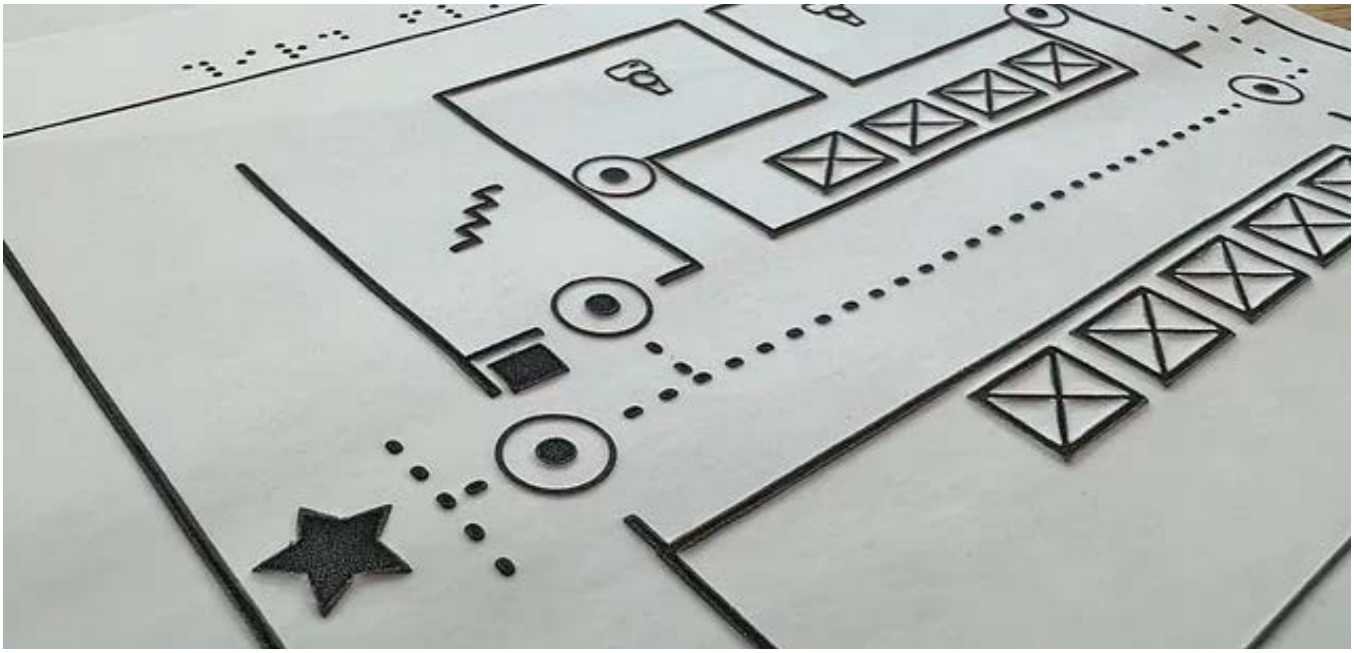


Figure 16. García, T. (2023). *Details of Swell Form ("Designing for touch")* [Photograph].

2.6. BINDING

The reason many of the processes/methods listed in previous chapters keep themselves to a low-cost mentality, or DIY nature, is because Braille books (if not produced in bulk) are often expensive. Being a project of 96 pages is important to provide possible alternatives to book binding and embossing in general for easier correction if necessary.

And as we're speaking of a possible elder audience, it's also important to consider accidents or damaged pages that might be frequent in this type of environment, if used in certain places like nursing homes.

There's a few things an individual should keep in mind before binding a Braille Book:

1. Braille pages are generally thicker due to the raised dots, so binding techniques must always accommodate for the bulk;

2. Nothing should obstruct page turning including the methods used to bind it. If a book isn't easy to fully open or page turn it should be discouraged altogether;

3. It must contain some level of page protection so it can withstand frequent handling without damaging the raised Braille text;

4. For personal use binding techniques are entirely optional, but for busy environments, detachable pages are more versatile for preservation.

For Braille in particular it's encouraged binding that allows the book to fully open above a flat surface without assistance, which proves very helpful for this project's intended audience, since many older individuals don't develop just visual impairments with age—**Spiral** or **Coil Binding** is the most commonly available option in Portugal—so this project took into consideration those page specifications.

Loose-Leaf Binding (Ring Binder), **Post binding** and **Comb Binding** are also equally viable options. That also might provide their own flat surfaces if necessary, along with the stylistic characteristics mentioned before. These are also good formats for any documents with Braille or tactile illustrations of this nature.

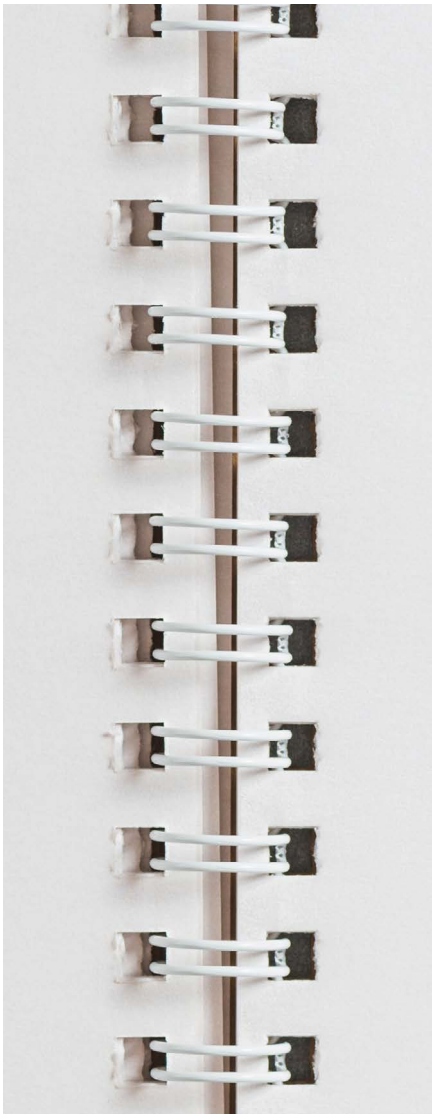


Figure 17. Freepik. *Detail of Spiral Blank Pages* [Mockup]

Figure 18. Unblast. *Ring Binder* [Mockup].

Figure 19. Reliure. *Example of Comb Binding* [Mockup].

2.7. BRAILLE & PRINTED TEXT

Reading style is left to right - In both texts.

The transcription of the poem to Braille was made by the student in relation to its parallel course education and uses simple **Level/Grade 1 Uncontracted Braille** (grade 2 and 3 proving too complex for its target audience but possible to be explored in different contexts).

Braille is always prioritized over printed text due to the nature of its audience. It's always in accessible places and taking in consideration how it's normally written in other books of this nature. No creative liberties were done in relation to shape or size and correspond to the national european portuguese standards.

The digital typography used to simulate Braille is a modified version of the font "Braille Normal" that is included with most Apple/ Mac computer systems. The font was changed using FontLab 8, adding just accents and punctuation that wasn't available on the English Braille Alphabet.

Grade 1 (Uncontracted Braille): Each character represents a single letter, number, or punctuation mark, with no abbreviations.

Grade 2 (Contracted Braille): Uses contractions and abbreviations for common words or groups of letters to improve reading speed and space efficiency.

Grade 3: An informal and shorthand-like Braille used for personal note-taking, with even more contractions and abbreviations. It's not standardized.

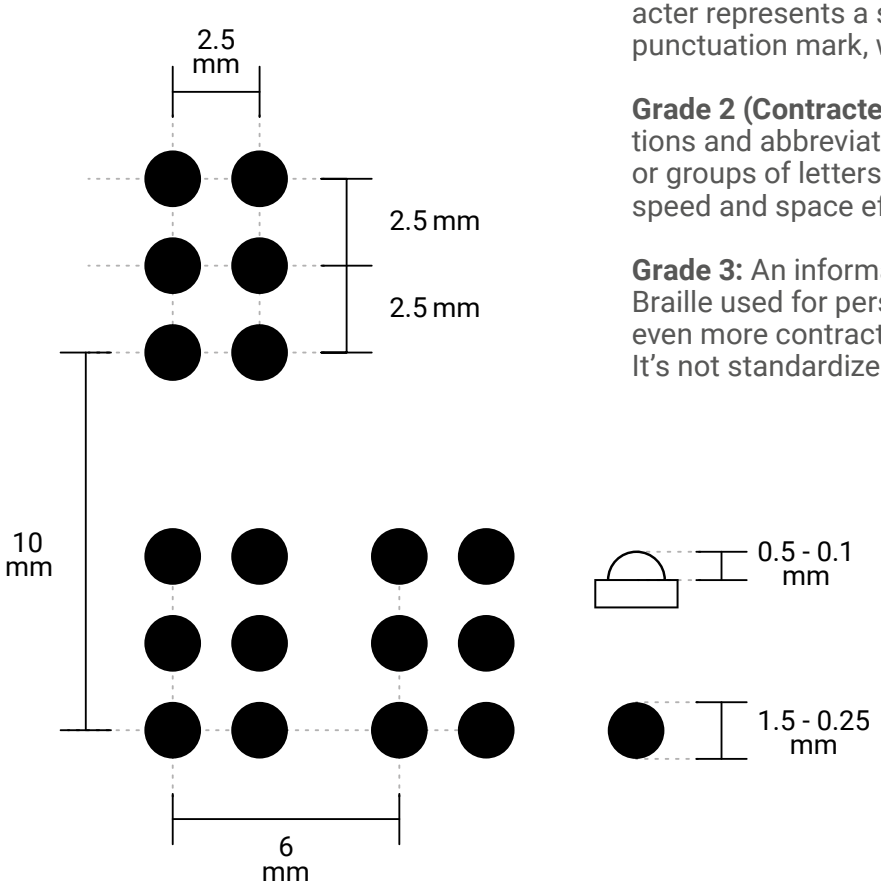


Figure 20. UK Association for Accessible Formats. (2017). Standard Dimensions Braille Cell.

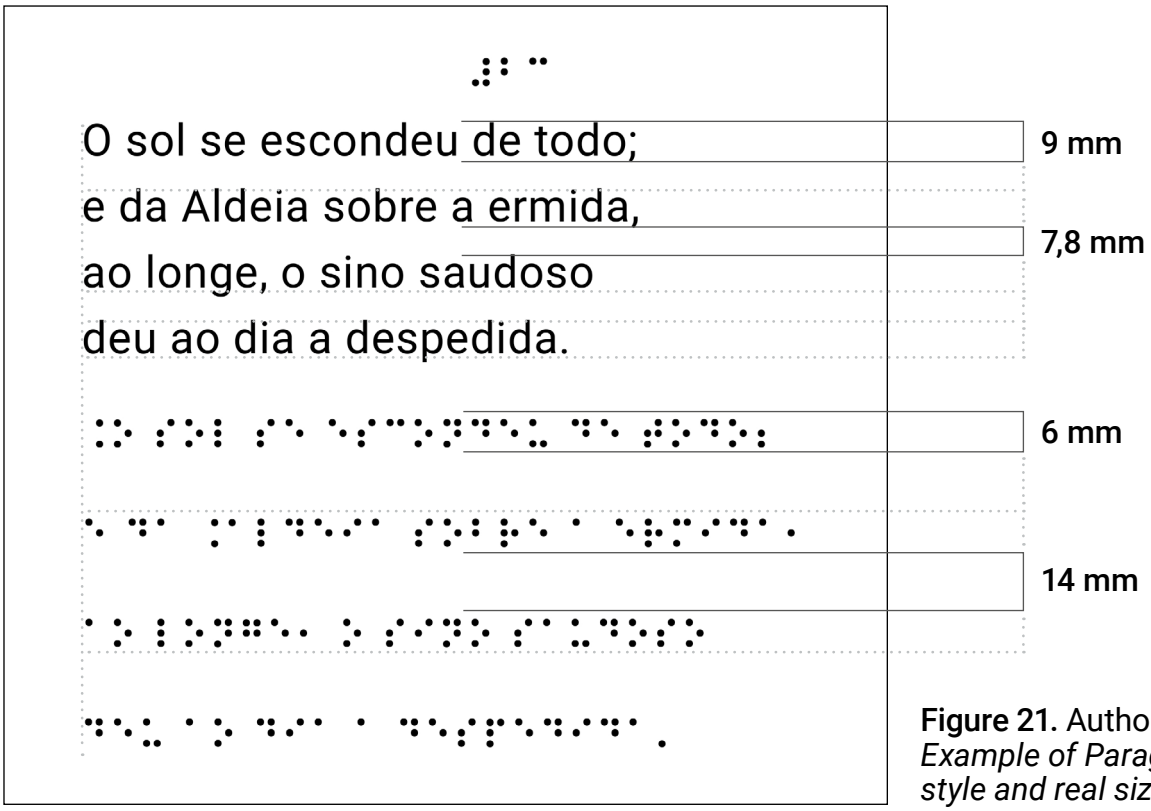


Figure 21. Author. *Example of Paragraph style and real size.*

The language chosen for this artifact was Portuguese due to its main focus audience and specific research, but also for being more familiar to the student, being their mother tongue, for easier translation and adaptation. (Translation and context for the poem and writer in english is provided by the student later on this thesis).

The type families chosen for this project were the "**Roboto**" and "**Archivo**" families. While not conventionally romantic in style, it was chosen for easier readability by an elderly audience, and for the inclusion of the simplified roman alphabet in clear bold styles. Utilizing large text for this book was crucial, not only to the effect of broadening the scope of audience, but for the type of audience a book of this nature often attracts.

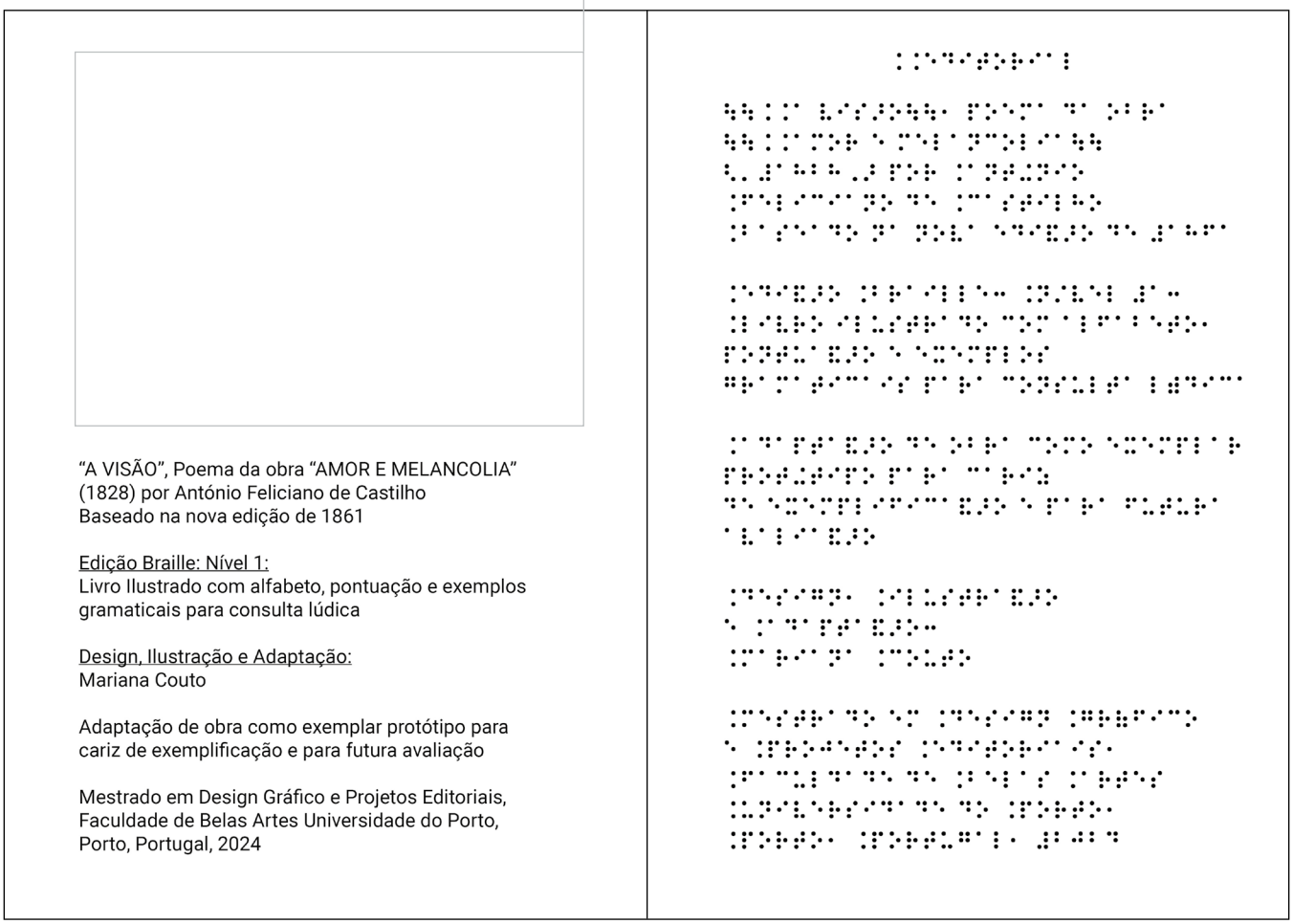
If replicated with other texts or for other types of media this aspect might change. But it's also here to provide the feeling of serialization and possible future adaptability to other written materials having just some minor style characteristics exclusive to this particular artifact (Illustrations).

2.8. PAGE STYLE

The prototype can be divided in 3 distinct sections. The first are the **opening** and **editorial pages** that explain the book thoroughly as well as provide the necessary information that any book should possess in its internal layout. While the remaining two always appear side by side: the **left** and **right** pages.

Empty spaces are negative areas created for the Braille. Due to the cover having Braille on the facing page, this one has to remain empty.

Figure 22. Author. *Cover and Editorial Page Spread.*



Left pages, in this project, prioritize visually heavy elements, distancing themselves from the areas with relief or Braille. These were used for consultation and to accompany the right ones while reading, with visual representations of braille and complete words sporadically as examples. While the left pages are not required to provide relief, the pages were constructed so no element would intersect if that would be the case for accessibility.

While this book doesn't require a Index in its usual format, page numbers allied with the alphabet, numbers and punctuation page markers also can assist an individual to locate themselves in the book, being present in every page except the opening pages.

The alphabet displays a basic, elementary school inspired appearance for familiarity and for quick comprehension, but also can be quickly understood by a helper or their close family, communicating instantly what the book is trying to provide on any page. This visual language stays present along the visual exercises, keeping consistency.

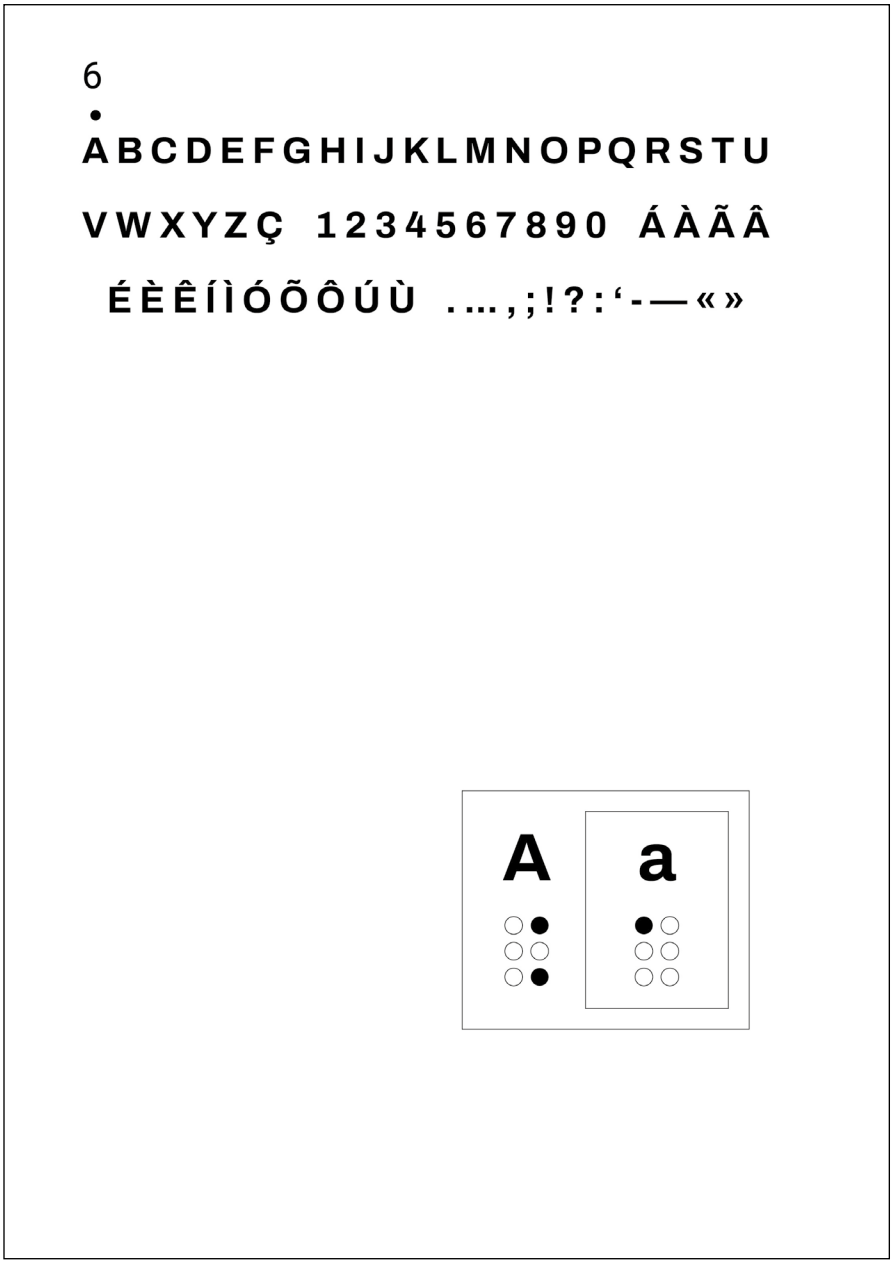
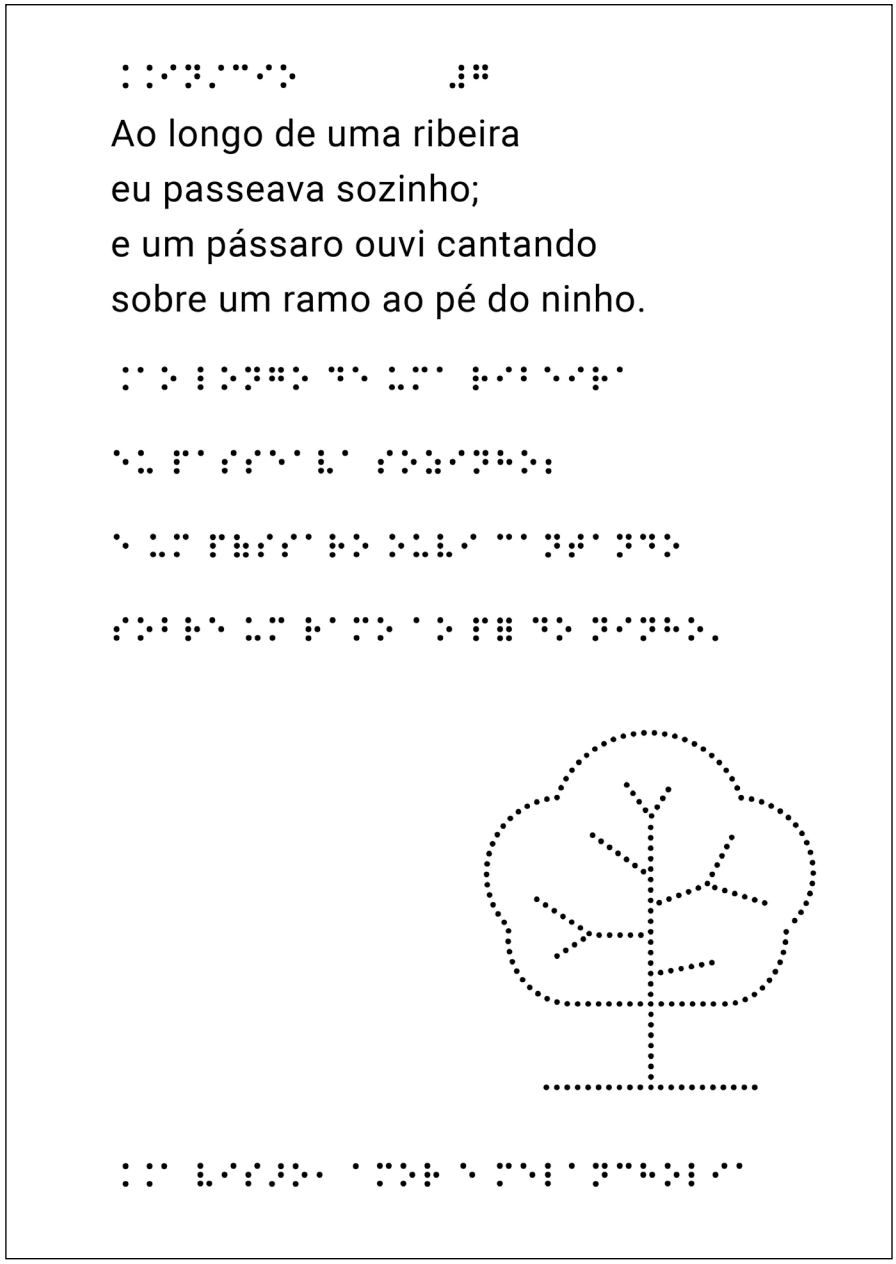


Figure 23. Author. *"A VISÃO: Amor e Melancolia" (Page 6).*

In Braille books, **Right pages** are by default prioritized over left ones for embossing. This is due to many factors, primarily by how books are generally utilized by everyone else as a concept, but also to not create discrepancies in relation to other books in its usage and storage.

Having embossing on just the right side of the book is also advantageous in a pragmatic sense. If Braille was placed on the left pages for example, there would be no natural way of holding a book this size open other than with both hands, being also unnatural in its page turning as it would require the search of the next one, an act any blind individual would not find comfortable or efficient.



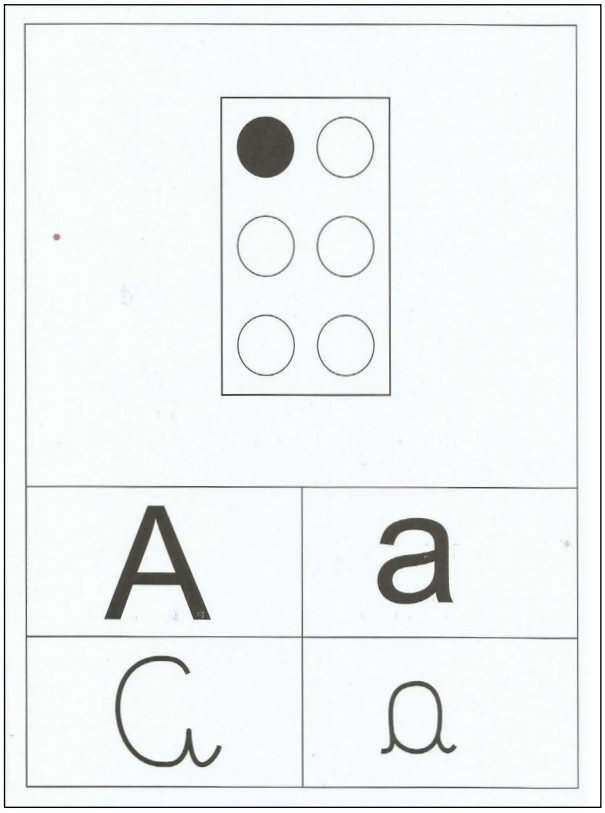
Unless both pages include tactile elements in some capacity, it is wasted potential to not take advantage of the right over the left pages for these types of elements; the finger is always in contact with the paper for easier navigation and page turning while not having to search anywhere else.

This solidified the right pages in their current form:

Having braille and its direct translations while also harboring the simplified illustrations, page numbers and necessary information for blind users.

Figure 24. Author. *"A VISÃO: Amor e Melancolia" (Page 7).*

The format for presenting the letter examples was inspired in special education exercises, providing a clean and simple approach to direct visualization. While also introducing the concept of conjoined braille cell letters in the form of Capital letters.



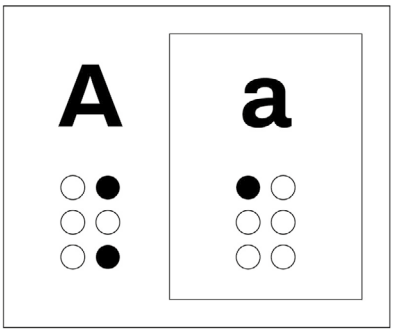


Figure 25.
atividadeparaeducacaoespecial. (2017). *INCLUSÃO: ALFABETO EM BRAILLE* [Scanning].

2.9. FORMAT & PARAGRAPHS

The printed text of the book always appears outside, slightly upwards or around braille, never directly above or below for two factors:

1. To not interfere with the braille sections directly and not pro duce errors in embossing;

2. Facilitates readability, not obstructed by possible paper deformations.

When reading Braille the finger is ideally positioned at a slight angle, around 20º to 45º degrees, from the reading surface. This allows the pads of the finger to make optimal contact with the raised paper. Keeping the finger too flat can reduce tactile sensitivity, while too steep an angle may result in missing or misinterpreting the characters. This angled position helps in maintaining both comfort and accuracy.

The book was formatted so the finger, if in use for reading, never hides the poem or other important information, this was specifically included for visually impaired readers as its structure doesn't affect blind individuals.

The text is directly based on the original, no punctuation changes or grammatical corrections, this was done to preserve the practical nature of the book despite its educational motivation, so it might still offer a comparatively 'normal' (as in closest to the source material) reading experience.

No decoration interferes with the readability of its print or braille sections and these don't overlap to cause any damage or produce errors with any of its interior sections. Its sectioned and clean nature invites the reader to a different but memorable experience that proves to be unique from your conventional single braille book.

Anyone ideally should be able to learn and/or read this poem in its entirety with only this book as reference, so all punctuation, accents and capitalization present, on the chosen edition of the poem, is presented for easy consultation even if distributed throughout the book. There are no indents or structural changes due to its literary origin, so paragraphs and phrases are static throughout the book, each text limited to its own section.

Right pages are divided by stanzas (quatrains) of the original poem and include their corresponding illustration directly below on the right corner of the page. Left pages are divided by each alphabetical, numerical and punctuation construction with the exception of the example pages that include 2 sets of letters to form complete words. These words fit into a theme related to its surrounding verses and feature both a word that starts with a Capital letter and a lowercase for comparison.

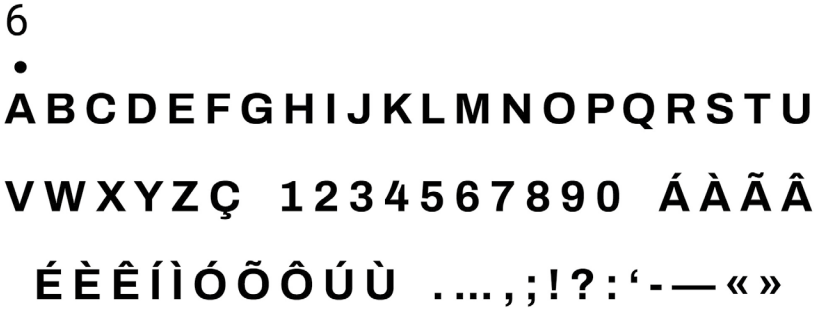


Figure 26. Author. *Example of Left Page Index (Page 6).*

Figure 27. Author.
Book Structure and Diagram Subtitles.

2.10. EDUCATIONAL PHILOSOPHY

This book's prototype uses an intermittent example-based learning method, based on the similar exercises realized during the APEC Course. Examples are distributed throughout the book and vary in complexity depending on its early to late page placement and the level of gradual letter acquisition.

7 This is prevalent to create a habit of **memorization**, seeing examples repeated many times, in addition to its visual representation in the form of sentences on the mirrored pages.

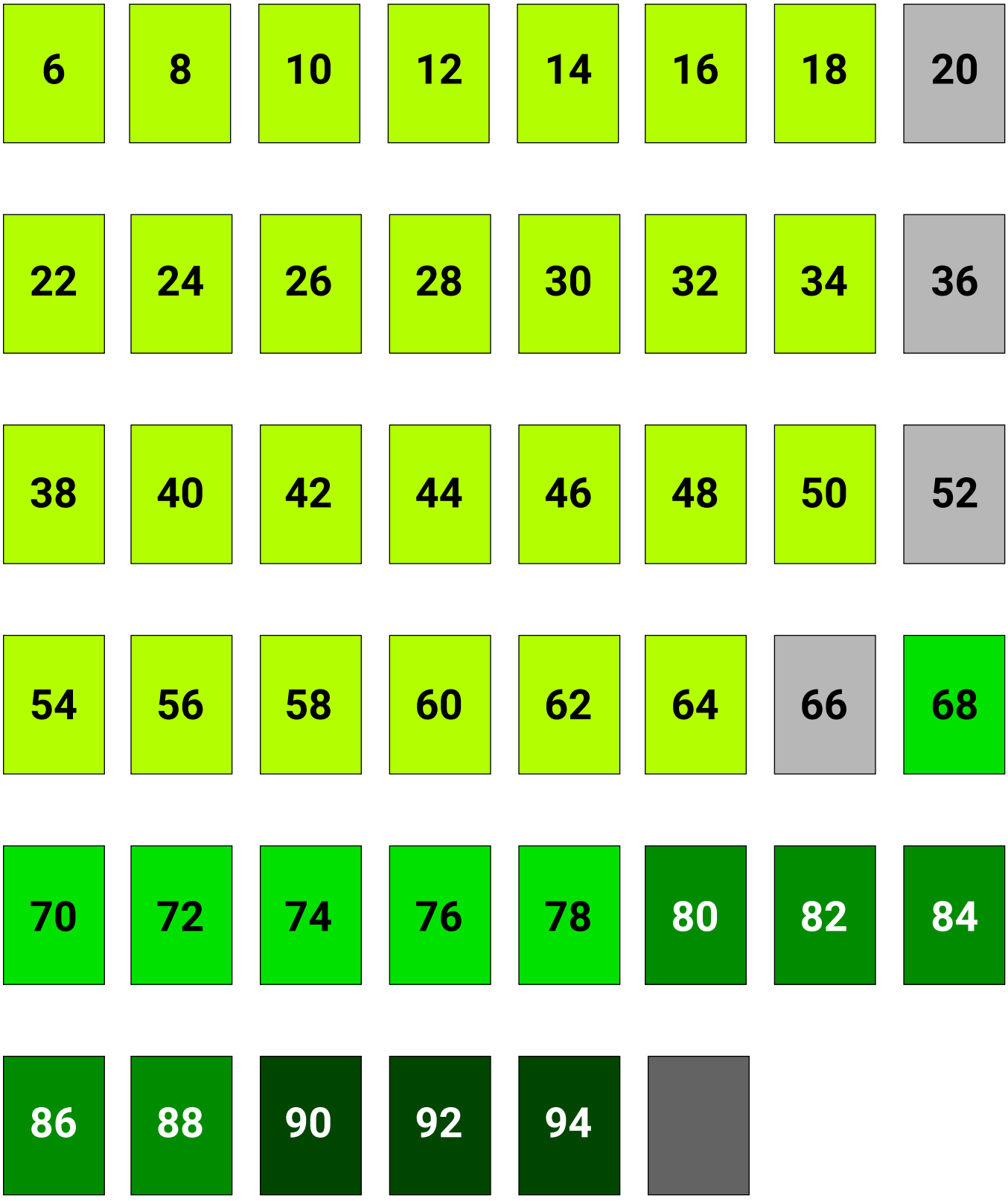
Exercises repeat every 8 spreads, with an intermission for numbers and diacritics, not differing in format to the initial alphabet portion. 'Accents' and words that use other simplified terms to refer to academic terminology were preferably used due to its audience level of literary comprehension.

Due its own format and paragraph disposition, printed text and its braille equivalent are presented paralleled and close in proximity, incentivizing exploration from a variety of readers. It also takes heavy inspiration from a variety of children's games and educational materials about the subject of education, simplifying its elements to its most basic formats.

As it was idealized for an equal reading experience despite the reader's visual impairments, it's not constructed based on elements that might've not assisted them permanently or wouldn't be able to be reliably used later with visual decline.

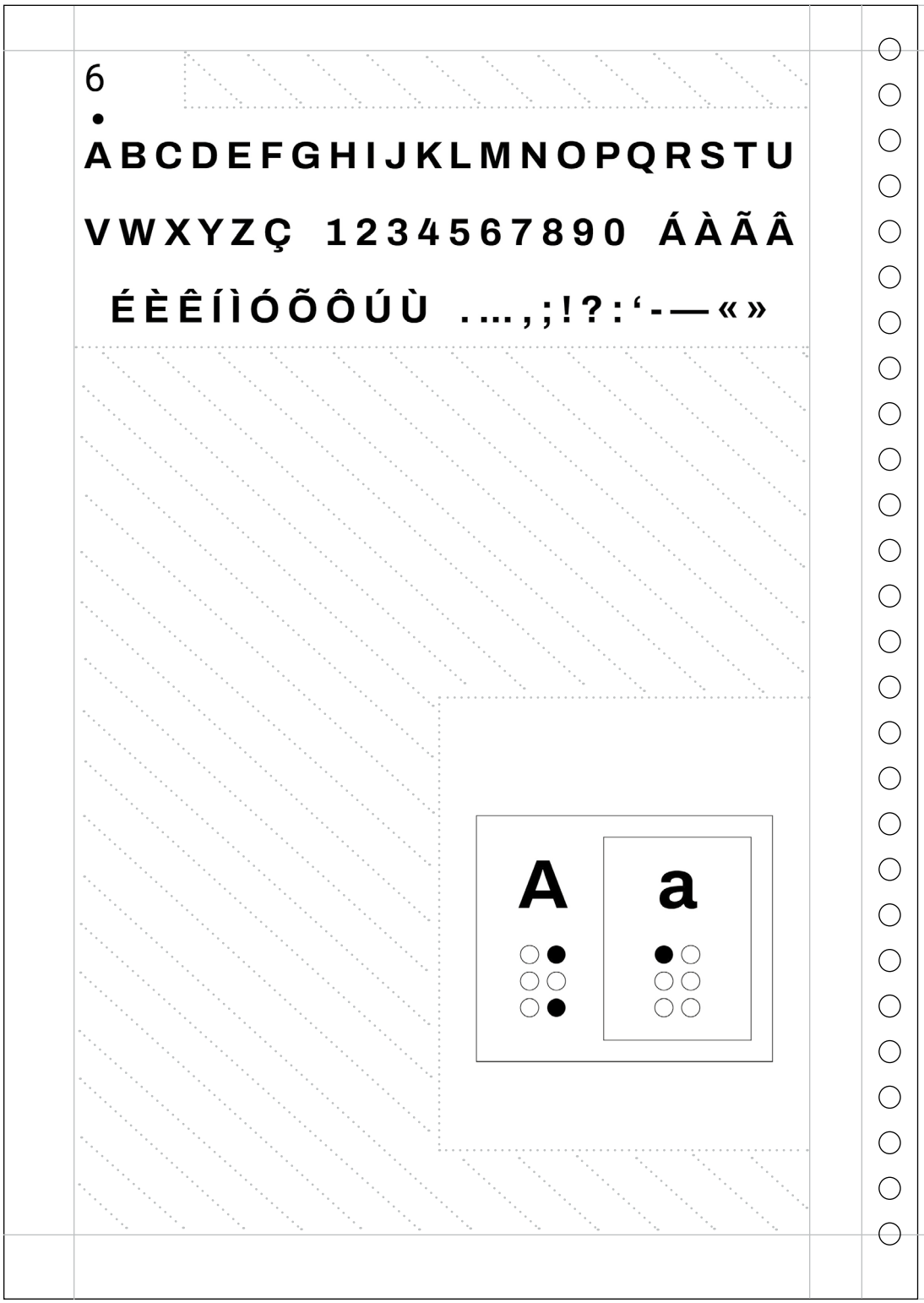
Colors in particular are entirely optional for the same motive as the optional cover, black on white is the most clear method of printing and visualization, so everything is heavily constructed to provide that same contrast and encourage alternative memorization techniques. This is based on the same principle that screen settings in technology offer in low visibility settings.

Editor.
Editor.
Intro.


6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
82
84
86
88
90
92
94

2.11. ANALYSIS

All information of the book is dual-readable and all pages provide both types of text (written and braille) with the exception of the editorial that is the only page that has braille only.



Alphabet;
Page Index;
Page Number;
(Print).

1
140x13mm

2
170x54mm

3
170x82mm

4
85x100mm

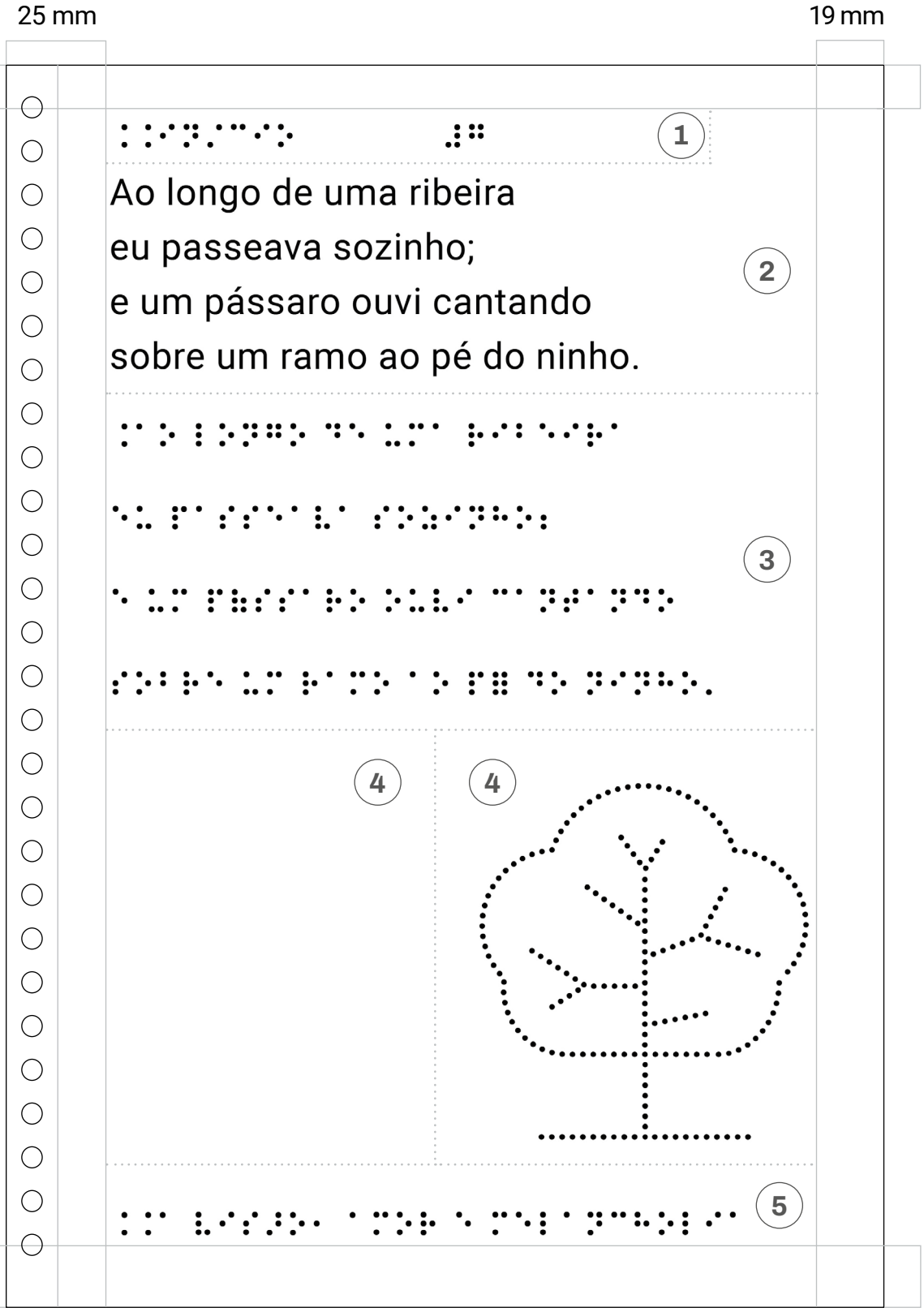
Visual Examples;

(Blank spaces for annotations or margins for embossment).

5
170x16mm

The book offers a quick structural example of its design on the opening pages after the editorial, directly describing its format in written form for their blind audience.

Figure 28. Author. *Analysis and Subtitles (Page 6 and 7).*



No standardized index is provided, as this prototype only uses a single poem as reference, with the exception being on each left individual page.

Each left page has its own index in the form of the current letter being displayed from the complete alphabet, with an indicator provided in the form of a dot above that letter for reference. The dot only disappears for sporadic exercises spread throughout the book.

Figure 29. Author.
Index and Visual Guides.

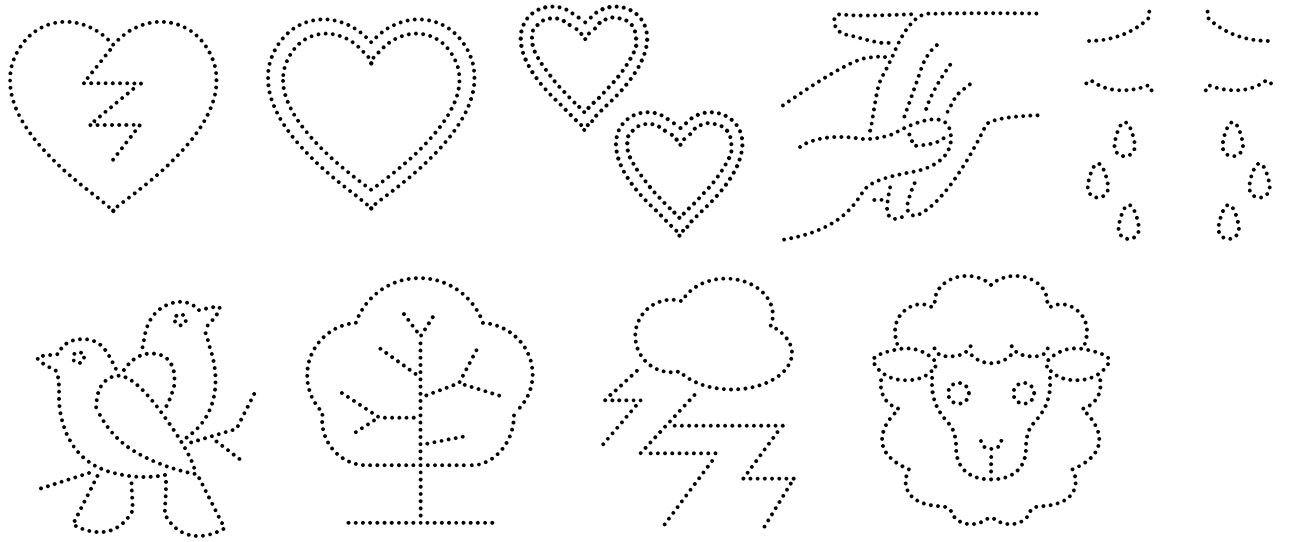


Figure 30. Author.
Illustrations (part.1).

2.12. ILLUSTRATION

The Illustrations for this book were created based on other illustrations for educational children's books and directional maps. Textures were not explored on the artifact due to the limitation imposed for its condition as an easy to be printed, or possibly handmade, book.

They were included to facilitate memorization and offer a quick localization method. They also incentivize exploration and interactivity with its reader.

Each illustration is directly connected to its individual page text and is limited to its own space on the bottom right corner. Every page is designed so every illustration has its own space not interfering with any text or facing page just like its alphabet/example counterpart in the mirrored page.

Due to its poetic nature, personal liberties were given by the author for each inclusion and design. It's exclusion or replacement it's also possible if the conditions are preferable (namely, personalization or experimentation with the individual's own stylus and/or handmade) If similar in nature for possible future readability.

The rose and flower elements are the repeating symbols for identification and to facilitate recognition as a love story and due to his poetic romantic nature, adjacent elements and illustrations paralleling this same narrative.

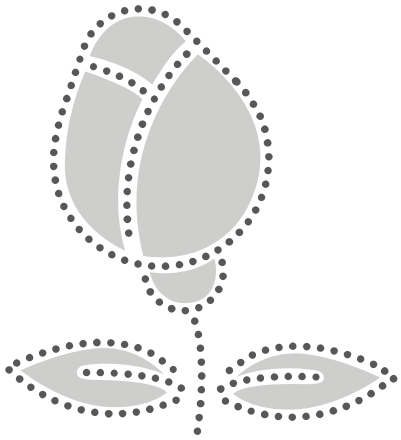
They're made using simple shapes made from simplified braille single lines, with negative space between them for readability (having the same dimensions as Braille itself). Each line is separated by at least an equally spaced dot, excluding contact points, to prevent confusion.

The first and last illustrations also work as quick directional indicators for the prototype, working as introductory and concluding indicators. The closed rose/flower is the first illustration while the rose appears last to conclude the poem.

Certain illustrations have mirrored or slightly changed versions throughout the book, this is made to create repetition or changing minor elements to suggest a bigger narrative (bells chiming, flowers blooming, time passing by, door opening, the elements of hearts, etc.).

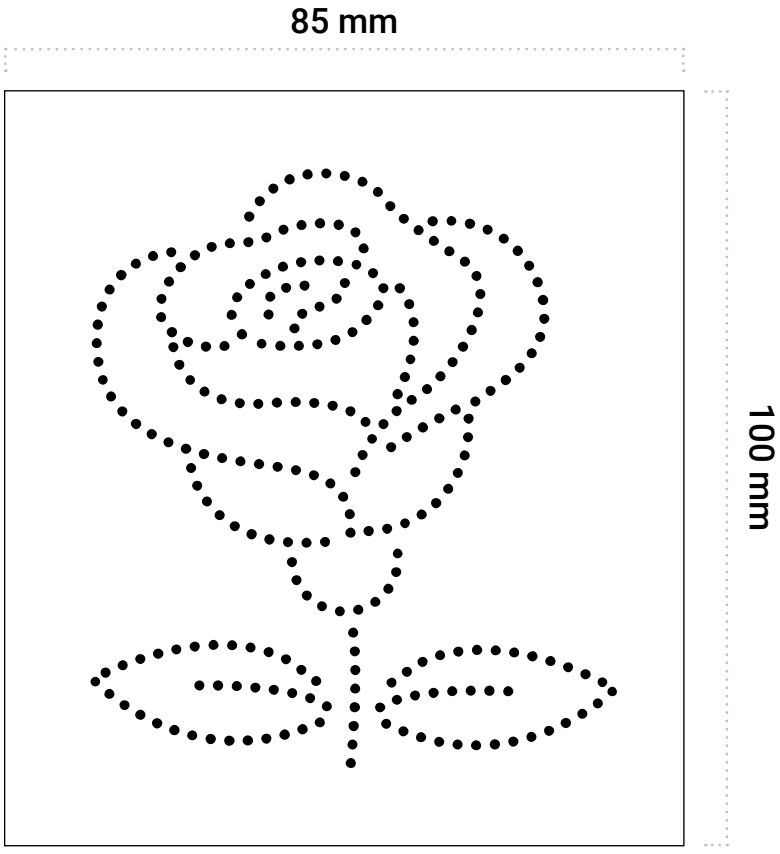
All illustrations are sized to fit in a specific dimension (85x100 mm) to properly be situated on the page and not conflict with other elements.

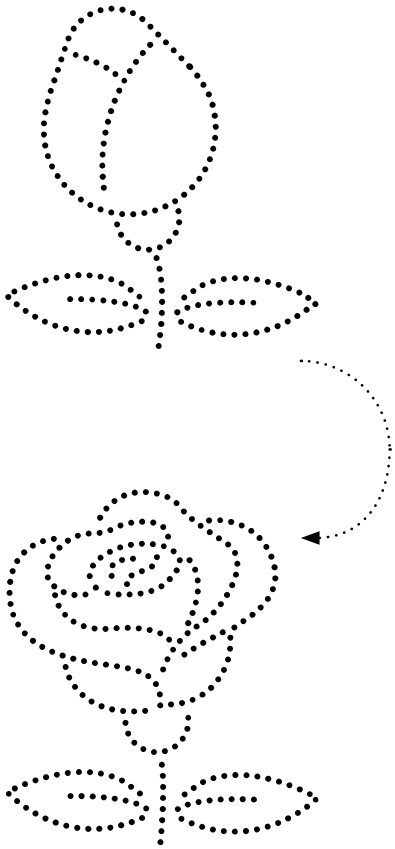
Figure 31. Author. *Illustrations (part.2) and Diagrams.*



Negative Space

Real Illustration Size:





Gradual / Selective Transformations

3. THE CONTEXT

3.1. THE WRITER & POET

"A one–eyed man is far less complete than a blind man.
He knows what he lacks."[19]

[19] Hugo, V. (1831). The Hunchback of Notre Dame: Vol. Book 1 (Chapter 5). Gosselin.

The primary written source used for this project is of the authority of the blind author António Feliciano de Castilho (1800—75), a prominent Portuguese writer and poet from the nineteenth century.

A concurrent portuguese writer of the time of both Almeida Garret and Alexandre Herculano, António Castilho had his own hand in shaping a generation of young intellectuals, followed closely by writers such as Eça de Queiros, Teófilo Braga and Antero de Quental.

His poetry was chosen for its historical context as well as its unique literary qualities, in particular, the ones focused on natural and almost tactile descriptions. It also shines a light on this influential blind author who contributed in some ways to the educational awareness of the country of Portugal to varying results during his lifetime.

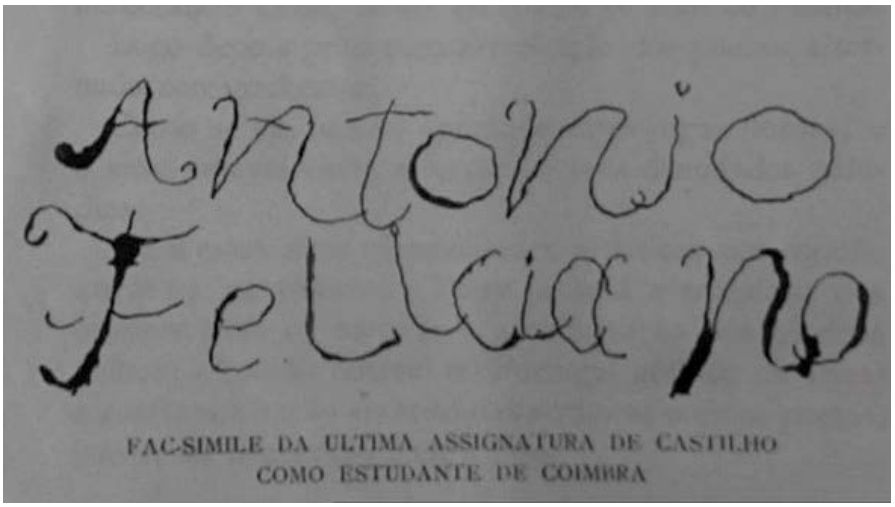


Figure 32. RTP Arquivos. (1975). *Last signature made by Castilho in Coimbra as a student* [Documentary].

Figure 33. Arquivo Municipal de Lisboa. (2015). *Photographic portrait of António Feliciano de Castilho.*

"I suppose that one of the reasons for the silence surrounding the figure of Castilho is that all our knowledge of him is more or less exclusively based on the knowledge that comes from the history of literature. (...)". Explains, in the commemorative documentary "*Castilho Morreu Há Cem Anos*"[20] (1975) about the centenary death of the poet, the historian and professor José Alberto Osório Mateus (1940—96). Known for his research work in the areas of Literature and Theatre, having some of the author's works even memorial donated from his personal collection to the Faculty of Arts of Lisbon, more specifically to the Library and Archive of Theater materials.

[20] RTP Arquivos. (1975, August 2). *Castilho Morreu Há Cem Anos – Parte I & II*. RTP Arquivos. (Original Texts in Bibliography)

"The history of literature is perhaps one of the most backward sectors of our cultural history in general, and one that most needs a comprehensive critical revision. Thus, the portrait we have of Castilho is necessarily deficient because it is still largely the portrait that the Generation of 1870 painted of him; our view of literary history in general has not changed at all since the Generation of 1870."

"The last author discovered in our literature was the last author known to the Generation of 1870, which was Gil Vicente; since then, there have been no further discoveries. The frameworks remain perfectly identical, the catalog of classics is the same, and the tables of literary value are unchanged. Naturally, Castilho's portrait suffers from this as well. The Generation of 1870's stance toward him was quite vigorous, and the portrait they painted of him is a polemical one, a reductive, simplistic, and extremely caricatured portrayal. Our view of him suffers precisely because of this — it suffers from never having undergone a sufficiently vigorous critical revision."

A few important things can be taken from his historical records, along with other relevant research and the influences they produced, that gives us a pretty conclusive picture of the Culture of Portugal in the nineteenth century, and even some aspects that are still reflected today, 200 years later.

While not blind from birth, the viscount António Feliciano de Castilho learned to live with complete blindness from a very young age. With help from his family, and brother Augusto, he started his studies of Latin at school - having published his first work to the public "*Epicedio na sentida morte da Augustissima Senhora D.Maria I*" at the age of 16, releasing an "incredible completed work for his age" according to literary scholars.

Everyone around the family, at that time, was surprised when he announced his intention to join his brother in furthering his studies in Coimbra. His father had such confidence in his abilities that he requested a very strict and very public admission test, something that was usually done in private with only the teacher body present. António Castilho demonstrated, to a room filled with students and teachers alike, his vast intellect and great comprehension skills that he extends way beyond his academic years.

He founded and directed the "*Lisboan Universal Magazine**", where he found a profound interest in pedagogy and alphabetization, utilising it as a means for his campaign for a more alphabetized country - using what he called his "*Method for fast reading**" or what scholars called "*The Castilho's Portuguese Method*[21]".

"António Feliciano de Castilho sought to defend an open school (...) that was designed for the youth (...) to feel comfortable, at ease, and happy, and not a school where they were oppressed by fear. This was one of the remarkable aspects of his campaign."

"Another aspect, and one that is particularly relevant today, (...) was that he was perhaps the first advocate for the democratization of primary education. At a time when most young people did not attend primary school because they did not have the means to do so, he (...) sought, defended, and fought for a school that was popular and accessible to all. This aspect, still perfectly relevant today, may surprise some people because Castilho's campaign is not well-known (...).". Dr. Fernando Castelo Branco, Olisipograph and Lisbon historian, 1975[22].

***Lisboan Universal Magazine**, Revista Universal Lisbonense, in portuguese.

***Method for fast reading,** Metodo de Leitura rápida, in portuguese.

[21] Castilho, A. F. (1853). *Metodo Castilho para o ensino rapido e aprasivel do ler impresso, manuscrito, e numeração e do escrever, Lisboa, 1853.* Biblioteca Nacional Digital.

[22] Castilho, A. F. (1975). *Correspondência pedagógica de António Feliciano de Castilho.* Biblioteca da Universidade de Trás-os-Montes e Alto Douro. (Original Texts in Bibliography)

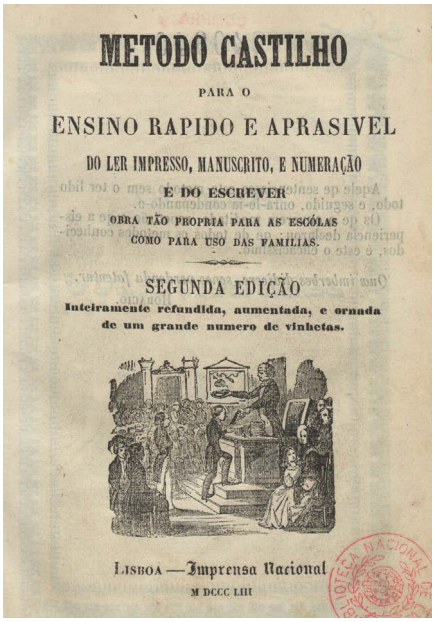

METODO CASTILHO
PARA O
ENSINO RAPIDO E APRASIVEL
DO LER IMPRESSO, MANUSCRITO, E NUMERAÇÃO
E DO ESCREVER
OBRA TÃO PROPRIA PARA AS ESCÓLAS
COMO PARA USO DAS FAMILIAS.
SEGUNDA EDIÇÃO
Inteiramente refundida, aumentada, e ornada
de um grande numero de vinhetas.
LISBOA — Imprensa Nacional
M DCCC LIII

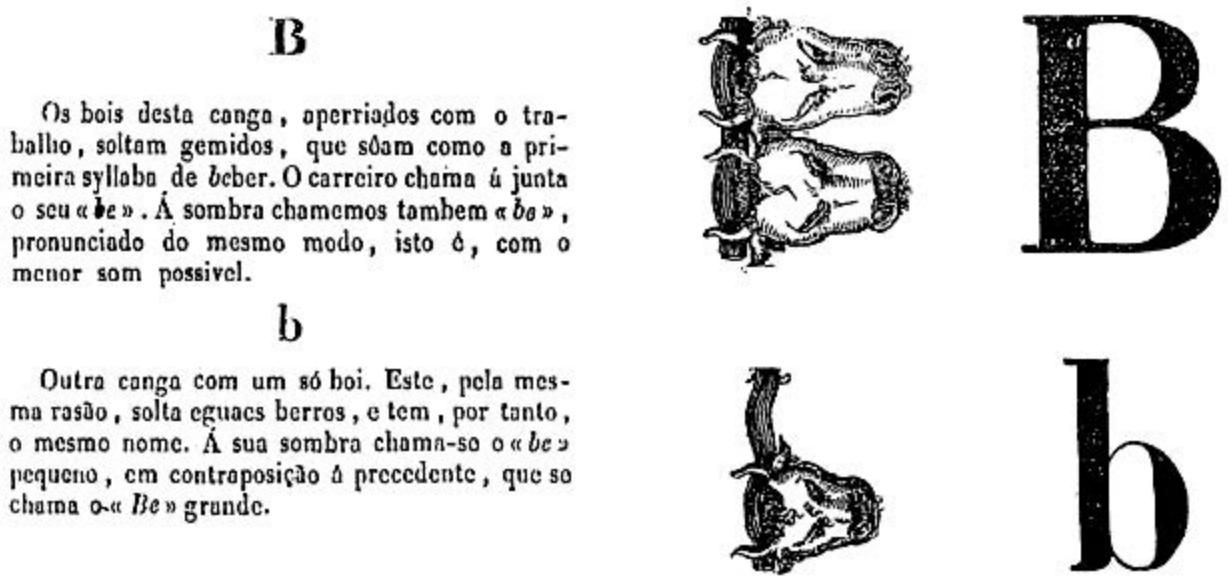
Figure 34. Castilho, A. F. (1853). *"Metodo Castilho para o ensino rapido e aprasivel do ler."*

"Reading, writing, and arithmetic should be popular and accessible to all. A common heritage and not a privilege. The rule, not the exception—and such a rare exception as it has been until now."

"Primary school should be as open and as mandatory for everyone as the baptismal font."

António Feliciano de Castilho, excerpts from both a letter to the Oralto Jornal and on the preface of his book "*O Outono**", a dedication to the current king, D.Luis[22].

***O Outono**,
The Autumn, in english.


B

Os bois desta canga, aperriados com o trabalho, soltam gemidos, que sôam como a primeira syllaba de *beber*. O carreiro chama á junta o seu « *be* ». Á sombra chamemos tambem « *be* », pronunciado do mesmo modo, isto é, com o menor som possivel.

b

Outra canga com um só boi. Este, pela mesma rasão, solta eguaes berros, e tem, por tanto, o mesmo nome. Á sua sombra chama-se o « *be* » pequeno, em contraposição á precedente, que se chama o « *Be* » grande.

Figure 35. Dias, J. M. T. (2000). *Castilho's Portuguese Method* (Letter B) [Scientific Paper].

In a time where the school itself was a privilege and not the norm, is a surprise that such a modern idea could be defended as harshly and as vocally as Castilho did, especially in a time where such ideas would be antagonised and criticised by the common person as going against the norm for the uneducated. A good concurrent example of this is the royal speech given by D.Pedro V, the king at the time, that got cut in certain sections by his own ministers for defending that education should be a necessity for his people[23].

When his method doesn't get approved and fails to reach the population at large, Castilho voluntarily moves to the Azores Islands, a place he wouldn't be heavily known or criticised for like in the Capital. He worked to the point of receiving honours in the fields of both Agriculture and Pedagogy, wrote many independent studies and literary works, created a printing-house where he published a local agricultural journal, organised literary conferences and founded his own society, the "*Sociedade dos Amigos das Letras e Artes**".

[23] Cesar Augusto Castro, Boto, C., & Luís, S. (2024). ANTÓNIO FELICIANO DE CASTILHO: *Cadernos de Pesquisa*, 30(4), 31–55.

***Sociedade dos Amigos das Letras e Artes**,
Society of Friends of Letters and Arts,
in english.

Something that marked his writing career for many year, and impressed even his contemporaries, was the arduous task of translating both the theatrical play of *Goethe** by the german writer *Johann Wolfgang von Goethe* and many plays by William Shakespeare without practically knowing any german or english. Something considered almost impossible without proper language background and even more difficult for those not versed in the poetic intricacies of both languages.

***Goethe**,
Fausto, in portuguese.

While controversial for his own time, criticising for many different factors, both new writers and fellow accomplished writers of his own generation. He always kept up with general public consciousness when writing his pieces, updating old texts and keeping in mind who and where those would've been read at. A man of business as well, he made an effort to generate more profit by linking his texts directly to fields he already sold published works on and created pieces about.

"(...) He re-multiplies past editions of works, as he adapts them to the taste of the time when he becomes an amateur historian, when necessary, because the taste of the time will premeditate validation. When he becomes pedagogical, it's because he has a strong awareness of the law of supply and demand, and seeks to know what the environment (...) will demand at a given time.". José Alberto Osório Mateus (1940—96)[20].

[20] RTP Arquivos. (1975, August 2). *Castilho Morreu Há Cem Anos – Parte I & II*. RTP Arquivos. (Original Texts in Bibliography)

One important aspect that marks Castilho's legacy, as well as the history of the Portuguese Literacy in general, was the ability to solidify and defend the professional status of a full time writer, not just be seen as a casual practitioner, in a new capitalistic society. The idea that a writer could earn enough to survive on its own and not depend on outside forces, hand me down works or side positions to stay in business was a novelty that very few benefited from. And he defended it - that it should be valued, defended and protected at all cost.

3.2. THE POEM 3

In 1826, António Castilho moved from the city to the countryside, along his brother Augusto, to the solitude of the Caramulo's Mountain Range* to follow on his brother's ecclesiastical career. This change of scenery deeply affected António, who grew up used to the movement and buzzling of the city, this reflecting itself in his work that became a lot more sombre and contemplative but also emphasising his more descriptive and natural elements.

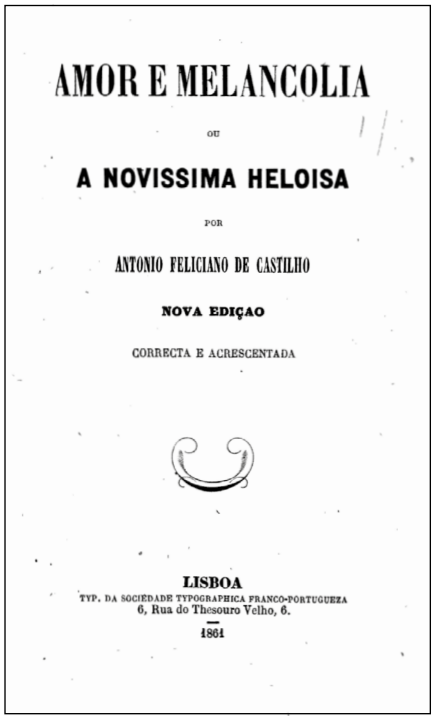
This also proved to be a safe refuge for the poet during the Liberal Wars that affected the country at the time (1828—34) a place isolated enough where he could keep up his studies as well as his personal passion of translating old roman classics to portuguese such as *Metamorphoseon* and *Amores* from the roman poet Ovid. He wrote some personal works during this time but it's one in particular, "*Cartas de Echo e Narciso**" that truly changed António's life.

In his solitude deep in the countryside, the poet finds solace in exchanging letters with his first great love, Lady Maria Isabel de Baena, a reclusive nun of the Convent of Vairão* in Vila de Conde. A fan of his works, Lady Maria Isabel in letters calls herself the hypothetical *Echo* that could inspire the poet, her *Narcissus*, to flourish and they keep exchanging these letters for many years.

It's in this stage of his life, that the poet writes "**The Vision**" or "*A Visão*", in portuguese. A poetic court from the series "**Love and Melancholy**" or "*Amor e Melancholia*" (1828), two volumes of honeyed and prolix bucolic poetry, and an almost complete Romanticist work.

As a result of the Liberal Wars, all religious orders of the country at the time were abolished, and the couple take this opportunity to marry in 1834. But this happiness doesn't last long as Lady Maria Isabel de Baena dies just barely 3 years later in 1837, at 40 years old and without any children.

Currently the **Portuguese National Library (BNP)*** doesn't own a Braille copy of this work for consultation in both partial or integral (no audio version either), the only work fully adapted being "*Os ciúmes do bardo*" But there are already many audio readings of the poem online for individual consultation[24].


AMOR E MELANCOLIA

OU

A NOVISSIMA HELOISA

POR

ANTONIO FELICIANO DE CASTILHO

NOVA EDIÇAO

CORRECTA E ACRESCENTADA

LISBOA

TYP. DA SOCIEDADE TYPOGRAPHICA FRANCO-PORTUGUEZA

6, Rua do Thesouro Velho, 6.

1861

Figure 36. Castilho, A. F. (1861). *Amor e Melancolia or Novissima Heloisa Front Cover.*

***Caramulo's Mountain Range**, Serra do Caramulo, in portuguese.

***Cartas de Echo e Narciso**, Letters from Echo and Narcissus, in english

***Convent of Vairão**, Convento de Vairão, in portuguese.

***Portuguese National Library**, Biblioteca Nacional de Portugal (BNP), in portuguese.

[24] Biblioteca Nacional de Portugal. (2024). *Recursos Braille*. Bnportugal.gov.pt.

Figure 37. Arnald, G. (1900). *Narcissus and Echo* [Landscape oil painting].

3.2.1. ORIGINAL & TRANSLATION

ORIGINAL

A VISÃO

Amor e Melancholia (1828) p. 36

Deh! dove senza me, dolce mia vita
*Rimasa sei si giovane e si bella.**

Oh! Onde sem mim, minha doce vida
Você continua jovem e bonita.

Ariosto, Ludovico. Ariosto Furioso.
*Capítulo VIII (C.76)**

TRANSLATION

THE VISION

Love and Melancholy (1828) p. 36

Deh! dove senza me, dolce mia vita
*Rimasa sei si giovane e si bella.**

Oh! Where without me, my sweet life
You remain young and beautiful.

Ariosto, Ludovico. Ariosto Furioso.
*Capítulo VIII (C.76)**

1	Ao longo de uma ribeira eu passeava sozinho; e um pássaro ouvi cantando sobre um ramo ao pé do ninho.	Along a river I was walking alone; and I heard a bird singing on a branch at the foot of the nest.
2	A esposa guardava os filhos co'as asas agasalhados; todo o vale era em silêncio; e eles ambos sem cuidados.	The wife guarded the children with her wings wrapped up; the whole valley was silent; and they were both careless.
3	De sua vida amorosa concebi toda a doçura; e achei-me sozinho à beira da corrente que murmura.	Of their love life I conceived all the sweetness; and I found myself alone on the edge of the murmuring current.
4	Afastei-me tristemente; e um zephyro de passagem me trouxe um cheiro de flores d'entre a próxima folhagem.	I walked away sadly; and a passing zephyro brought me a smell of flowers between the close foliage.
5	E eu disse: «Este hálito doce «do seio de esposos vem; «mais de uma florinha virgem «agora se torna mãe.»	And I said: «This sweet breath «comes from the bosom of husbands; «more than one virgin flower "Now becomes mother."
6	Vi que estava solitário; e d'este aroma, o prazer junto á beira da corrente mais me veio entristecer.	I saw that I was alone; and from this aroma, the pleasure along the edge of the stream more it made me sad.

7	O sol ia quase a pôr-se; e a frouxa luz que espargia, as águas, e o campo, e o bosque, tudo em púrpura tingia.	The sun was almost setting; and the faint light that spread, the waters, and the field, and the forest, everything dyed purple turned.
8	Ao longe, ouvia as pastoras, que os seus rebanhos levavam; eles balavam contentes, elas de amores cantavam.	In the distance, I heard the shepherdesses, that their own flocks carried; they bleated happily, they sang of love.
9	O sol se escondeu de todo; e da Aldeia sobre a ermida, ao longe, o sino saudoso deu ao dia a despedida.	The sun completely hid; and from the Village over the hermitage, In the distance, the longing bell bid farewell to the day.
10	Os campos ficaram tristes. Só, de momento em momento, se ouvia um cão em distância, ou brando agitar-se o vento.	The fields turned sad. Only, from moment to moment, Could be heard a dog in the distance, or gently stirred the wind.
11	E eu me achei só, assentado ao pé d'água que fugia; e os sons da tarde em minh'alma dobraram melancolia.	And I found myself alone, sitting at the foot of the running water; and the sounds of the afternoon in my soul doubled the melancholy.
12	Já tinha nascido a lua no céu formoso de estrelas; quando boiava água a baixo barco sem remo nem velas.	The moon had already risen in the beautiful sky of stars; when the water was floating below boat without oar or sails.
13	E o barqueiro ia cantando não sei que saudosas mágoas... assentado sobre a pôpa, debruçado sobre as águas;	And the boatman was singing I don't know what sad sorrows... sitting on the stern, leaning over the waters;
14	e quando ele interrompia seu cantar, e assobiava, mulher que vinha com ele, em voz muito doce cantava.	and when he interrupted his singing, and he whistled, woman who came with him, in a very sweet voice she sang.
15	A noite, as auras, a lua, rouxinóis a gorjear, me inspiraram sentimentos, que não tive a quem narrar.	The night, the auras, the moon, nightingales chirping, feelings that inspired me, which I had no one to tell.

16	Então, com o pranto nos olhos, no coração a tristeza, «¿Que faz a flor no deserto?» perguntei à natureza.	Then, with tears in my eyes, sadness in the heart, “What does a flower do in the desert?” I asked nature.
17	«¿Que faz um astro brilhando «a paiz deshabitado? «¿que presta um cabeço fertil «no meio do mar salgado?	«¿What does a shining star «do to an uninhabited country? «¿what provides a fertile head «in the middle of the salty sea?
18	«¿Porque me fazes num vago «inutil fogo abrazar, «se não acho n’este mundo «uma só que eu deva amar?!»	«¿Why do you a vague «useless fire makes me embrace, «if I don’t find in this world «only one that I should love?!»
19	E eu voei com o pensamento, qual relâmpago ligeiro, aos muros silenciosos de solitário mosteiro.	And I flew with that thought, like a flash of lightning, to the silent walls of a lonely monastery.
20	Melancôlico e silvestre era todo esse lugar: de um lado, montanhas ermas! do outro, pinhais, e o mar!	Melancholic and wild it was all this place: on one side, desolate mountains! on the other, pines, and the sea!
21	E eu entrei ao mesmo tempo no fundo do santuário; das campas o surdo estrondo movi com pé temerário!	And I entered at the same time to the bottom of the sanctuary; from the graves a dull roar was heard and I moved with a reckless disposition!
22	Por toda a parte achei noite, e o silêncio mais profundo: nenhuma voz! nenhum passo! nenhum dos filhos do mundo!	Everywhere I found night, and the deepest silence: no voice! no step! none of the children of the world!
23	Só do mocho sobre o tecto o triste piar se ouvia, que pela abóbada extensa se alongava, e se perdia.	A owl above in the ceiling the sad chirp was heard, that by the extensive vault it stretched and got lost.
24	Logo o relógio da torre meia noite fez ouvir; do templo os echos acordam, e tornam logo a dormir.	Soon the tower clock midnight makes heard; In the temple the echoes wake up, and then go back to sleep.

25	Depois um sino, tocado por forte invisível mão, chamou triste os pensamentos para a nocturna oração.	Then a bell, rung by a strong invisible hand, called the sad thoughts for the night prayer.
26	Do côro, até ali deserto, foram cheios os lugares; no ar, até ali calado, reinaram ternos cantares.	From the choir, until then deserted, the place became full; in the air, until then silent, tender songs reigned.
27	A hora, o lugar, as trevas, e aquelas vozes suaves, reuniram na minha alma há ternura ideias graves.	At that time, that place, that darkness, and those soft voices, gathered in my soul the tenderness of serious ideas.
28	Ao tronco de uma coluna pensativo me encostei. Muito mais triste que antes, e muito mais só me achei.	To the trunk of a column I leaned my back thoughtfully. Much sadder than before, and much more I just found myself.
29	Emudeceu todo o côro; eis as luzes se retiram; bateu a porta ao fechar-se; as santas irmãs saíram.	The entire choir went silent; and the lights went away; they slammed the door shut; the holy sisters left.
30	Da lampada veladora o lume, já quase extinto, de mil trémulos fantasmas encheu do templo o recinto.	From the candle lamp it's fire, already almost extinguished, of a thousand trembling ghosts filled the temple grounds.
31	Logo o relógio da torre uma hora fez ouvir; do templo os echos acordam, e tornam logo a dormir.	Soon the tower clock one hour makes heard; In the temple the echoes wake up, and then go back to sleep.
32	Afastei-me horrorizado, e veloz nesse momento ao dormitorio tranquillo me arrojei com o pensamento,	I walked away in horror, and fast at that moment to the quiet bedroom I dared myself with a thought,
33	Mão na face, e olhos na lua, vi, dentro de escura cela, chorosa virgem, sentada às grades de alta janela.	Hand on face, and eyes on the moon, I saw, inside a dark cell, a crying virgin, sitting down at the side of a high window's bars.

34	Conheci por seus cabelos, e seus trajes seculares, que não era das votadas eternamente aos altares.	I knew by their hair, and their secular attire, which was not one of the votes eternally to the altars.
35	Conheci que um pensamento nutria triste, e profundo; e eu disse: «Qual eu me vejo, «se vê sozinha no mundo!»	I knew that a thought was growing sad, and deep; and I said: «Which I see myself, «you see yourself alone in the world!»
36	E todos quantos afetos sua alma encerrados tinha, num profetico delirio foram presentes à minha.	And all the affection their enclosed soul had, in a prophetic delirium were present to mine.
37	Apertei-lhe a mão com força; e chegando-a ao coração, «Ambos achámos» — lhe disse — «o que buscamos em vão.	I squeezed their hand tightly; and reaching it into my heart, “We both found it” — I told them — «what we seek in vain.
38	«Por este céu me protesta, «que eu juro por este céu, «tu, ser minha eternamente; «eu, ser para sempre teu.»	«For this heaven protests me, «that I swear by this sky, «you, be mine eternally; «I, be yours forever.»
39	O céu ouviu nossos votos; viu-nos a lua abraçar; e ambos juntos assentados ficámos a conversar.	Heaven has heard our vows; the moon saw us embrace; and both sitting together we stayed talking.
40	Logo o relógio da torre duas horas fez ouvir; os ecos de novo acordam, e tornam logo a dormir.	Soon the tower clock two hours makes heard; the echoes wake up, and then go back to sleep.
41	Mas esta virgem quem era porque entrou na solidão? de onde o seu ar pensativo? de onde a interna agitação?	But who was this virgin? Why did she enter solitude? Where does her thoughtful look come from? Where does the internal turmoil come from?
42	Alta noite!.. ela sozinha!.. porque razão não tremeu ? ao mortal desconhecido como subito se deu!	Late night!.. she was alone!.. Why didn’t they shake? about this mortal unknown how suddenly it happened!

43	Onde existe esse mosteiro, esse encantado lugar ? de um lado, montanhas ermas! do outro, pinhais, e o mar!	Where is this monastery, this enchanted place? on one side, desolate mountains! on the other, pines, and the sea!
44	Homens, deixarei meu segredo; Basta saber que eu sou dela, seja onde for seu retiro, seja quem for esta bela.	Men, I will leave my secret; Just know that I'm hers, wherever her retreat is, whoever this beauty is.
45	Mulheres, este fantasma vos exede nos encantos, Serão dele eternamente o meu amor e os meus cantos.	Women, this ghost exceeds you in charms, They will be his forever my love and my hymns.

4. UNIVERSAL DESIGN

Universal design is the approach to designing products, environments, and services that are accessible and usable by all people, regardless of their age, ability, or disability[25]. A concept that has been embraced more and more as the world has become more inclusive due to the infusion of different cultures, new global technological advancements and the extended, in real time, human connections brought by the internet and their users.

[25] Centre for Excellence in Universal Design. (2024). *About Universal Design*. Universaldesign.ie.

[26] Burgstahler, S. (2021). Universal Design: Process, Principles, and Applications. Washington.edu.

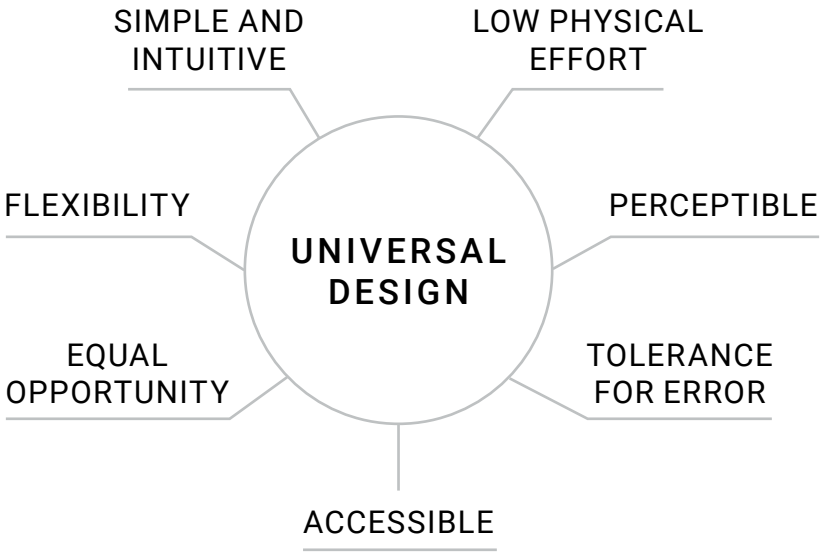


Figure 38. Author. *UD Universal Design Principles.*

Note. Based on a Paper published by Sheryl Burgstahler.[26]

4.1. PORTUGAL & INCLUSIVITY

Portugal in recent years has made slow but significant advancements towards a more inclusive future, especially towards blind individuals, even having its first elected blind member, Ana Sofia Antunes, as "Secretary of State for Inclusion of People with Disabilities" in 2015[27].

National monuments, natural parks, transport stations, government buildings and infrastructures require basic safety information to be available to blind individuals by the use of engravings, tactile flooring or audio supports ever since 2015, but it's been gradual in its complete integration. Reserved spaces and places, basic tools and commodities, or just offered assistance are some of the support offered by the government, but these are heavily simple and often don't delve into detail on how or to what extent they can be used effectively.

People with vision impairments in Portugal, especially later in life, need to learn that these exist by themselves and reading isn't often the first place these individuals think of, instead relying on their family, friends or caretakers to provide them with much needed information. Something that can be difficult when they live in isolation, outside of city centres or think they might've lost the ability to read along with their loss of vision.

While adapting the prototype of this thesis it was important to make it clear this wasn't meant to be a substitute for a teacher when it comes to learning to read braille, or a book a newly blind individual could pick up immediately. It can indeed be versatile and be picked up by a blind individual while also be accessible enough to a person familiar with their own visual limitations, but it is also limited by its exposure to its audience.

Its exposure is unpredictable, unless truly published one day, but its readability and conceptualization was designed to work as a standalone book independent of outside influences and be self reliable. This means that its own strengths lie in the ability to fit into numerous scenarios without being restricted to neither and that, by definition, makes it an example of Universal Design.

[27] República Portuguesa, & Segurança Social. (2019). *Guia Prático: Os Direitos das Pessoas com Deficiência em Portugal*.

Associação Salvador. (2023). *Pessoas com Deficiência em Portugal Indicadores de Direitos Humanos 2023*. Instituto Superior de Ciências Sociais e Políticas - ULisboa.

Fontes, F., & Martins, B. S. (2023). *A deficiência em Portugal: Lugares, corpos e lutas* [Project].

5. THE INDIVIDUALS 1

To understand the way an object interacts with its audience we need to also take a look at the audience as a whole. Some generalisations will be taken into account, but as a general note, there will always be some local discrepancies when we speak about the way the subject of visual impairment is spoken around the world, even today.

It's a condition that is viewed differently from country to country, individual to individual, and has its own variety of cultural and contextual backgrounds supporting it in the way individuals with the condition are integrated in society today like many other mental and physical conditions. The characteristics present in this section will be consistent to credible sources and based solemnly on collected research and studies based on the study subject in question.

World Health Organization. (2018, October 11). *Blindness and vision impairment*. World Health Organization: WHO.

CDC. (2011, April). *Blindness and Vision Impairment*. Centers for Disease Control and Prevention.

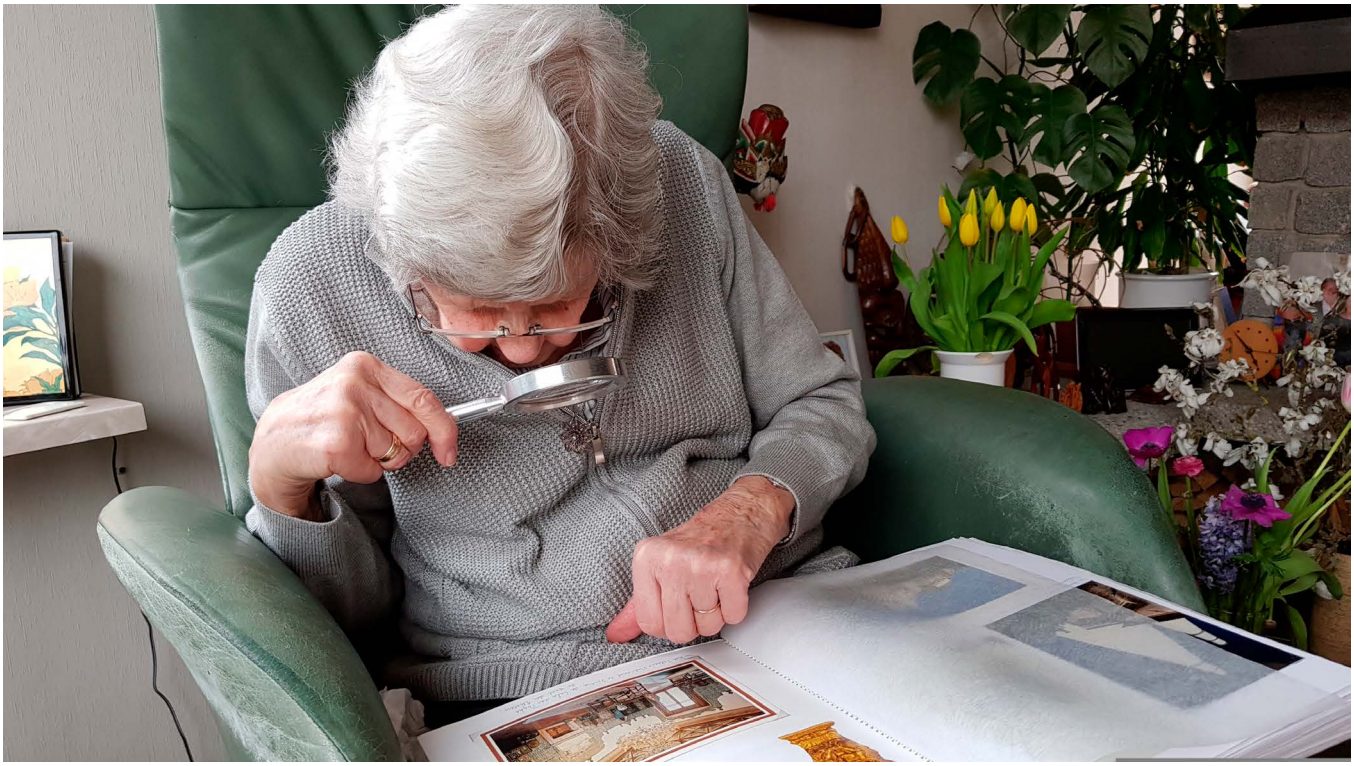


Figure 39. Dassel, A. (2018). *Elderly women using a magnifying glass* [Photograph].

5.1. LEGAL TERMS & ASPECTS

When discussing blindness and visual impairment, it is essential to have a clear understanding of certain terminology used, and by extension, its usage in this thesis.

This chapter aims to clarify the key terms and concepts commonly encountered in this field providing a foundation for its informed evaluation. However, it is important to note that this portion of the thesis will not delve deeply into the medical aspects of blindness or the personal experiences of individuals living with visual impairment. While understanding the biological and psychological dimensions of blindness is crucial, the focus here is on the language and definitions that form the basis some arguments might require.

Visual or **vision impairment** (**VI** or **VIP**) is the partial or total inability of visual perception. This means that the eyes might not perceive clear images or keep track of every single aspect presented to them but it might still capture certain qualities like light, shapes, colours, or motion. This can also be applied for individuals that might have one of their eyes damaged, have it reduced over time due to health reasons or just having them unavailable for short periods of time. **Visual acuity** > 20/60 (6/18) = or < 20/200 (6/60).

Vision loss may cause a person difficulties with simple tasks over time, including reading and walking. In this thesis when we speak of vision loss it will be applied directly to ageing and its effects and not due to other diseases or illness. While it's true that individuals that lose eye sight also have **higher risks** of direct **physical danger**, those can also be attributed to poor reflexes and balance from older individuals, so when used, it will refer only to **object awareness**.

While **Color Blindness** can be an aspect of vision deficiency, it won't be as relevant to the project in question, as it's not being applied for reading and/or direct information acquisition. Every reader is welcomed to be considered an equal for this study, but this particular factor of blindness will not be a strongly defining factor for the final result.

World Health Organization. (2015, July 14). *Change the Definition of Blindness*.

Kenny, A. (2018, August 20). *Research, Fighting Blindness* - Charity with a Vision to Cure Blindness. Fighting Blindness.

Optical Images. (2021, December 21). *What's the Difference Between Low Vision and Blindness?* Optical Images.

Caltrider, D., Gupta, A., & Tripathy, K. (2021). *Evaluation Of Visual Acuity*. PubMed; StatPearls Publishing.

Almog, Y., & Nemet, A. (2010). *The Correlation Between Visual Acuity and Color Vision as an Indicator of the Cause of Visual Loss*. American Journal of Ophthalmology, 149(6), 1000–1004.

Complete blindness also known scientifically as **total blindness** or **NLP** (no light perception), refers to the complete inability to see any light or visual images. In this condition, the eyes do not detect light, and the visual pathways in the brain do not process visual information. **Blind** is a term and adjective that will be used only under this context, to describe a physical condition that affects certain individuals, and not as a misused or negative quality. **Visual acuity** > 20/400 (6/120).

Terms that will be used under these specific contexts: Blind / Legally blind / Limited vision / Low vision / Partially sighted / Visually impaired / Vision Deficiency.

Blindness in combination with **hearing loss** is known as **deaf-blindness**. The term **deaf-blind** or **deafblind** will be used for this condition only and it will be taken in as much importance as complete blindness. Limited hearing will also be considered as a side effect of ageing or a medical condition that might manifest later due to many factors.

The terms **Disabled** and **disability** will also be used by its scientific terminology and as a general term for a physical, mental, developmental or intellectual disability. Even if the psychological aspects of blindness might not be especially focused on apart from its social context, it's important to remember that at one point in human history, these terms were used to describe people with one or more of these conditions negatively.

Hyvärinen, L. (2007). *Implications of Deafblindness on Visual Assessment Procedures: Considerations for Audiologists, Ophthalmologists, and Interpreters*. 11(4), 227–232.

National Centre on Disability and Journalism. (2018). *Disability Language Style Guide | National Center on Disability and Journalism*. National Center on Disability and Journalism.

CUF. (n.d.). *Saúde A-Z: Doenças, Sintomas e Tratamentos - Cegueira*.

5.2. PERCEPTION & LIMITATIONS

Perception is an important factor for blind individuals because of their exclusive connection to the physical and auditory medium when it comes to reading and comprehension. This means that any information that it's not correlated to a blind reader by sound needs to be, exclusively and fully, displayed and accessible to the reader's skin and/or fingers so they could also assess "silent" or strictly visual information and for it to be successfully perceived.

Radziun, D., Crucianelli, L., Korczyk, M., Szwed, M., & Ehrsson, H. H. (2023). *The perception of affective and discriminative touch in blind individuals.* Behavioural Brain Research, 444, 114361.

With this in mind it's not only necessary to be aware of to what individual, and consequently audience, a book might cater to, but to also adjust its text and relief accordingly to its perception of the narrative and/or environment. It itself needs to be intuitive enough to not confuse or alienate the reader, while not be-

ing obnoxious in its display and hinder the experience of reading altogether when providing an experience for a limited part of the population.

Facial and Social Cues, Ethnic groups and certain physical characteristics might not be that relevant to take into consideration for a basic blind comprehension, but other factors like age, gender and cultural factors might heavily play a part in each subject's enjoyment and understanding of a piece or object. This balance, more times than not, appearing on a multitude of other design theory subjects, comes to prove that we need to understand the strengths and pitfalls one might face when adapting an originally intuitive text into a more limited physical environment and the importance of cataloguing these experiences for future study.

According to the Perkins School for the Blind[28], an organisation specialised in helping children with disabilities especially blindness, there's a few things to consider and provide so that children, as well as individuals starting to learn Braille with sensory books, might find more rewarding to partake:

[28] Perkins School for the Blind. (2019). *Perkins School for the Blind*. Perkins School for the Blind.

Perkins School for the Blind. (n.d.). *Eight tips to introduce reading to your young child who is blind*. Perkins School for the Blind.

1. Choosing times and places that are quiet, comfortable and free of distractions. Avoid things that might make a person lose focus and lose track of what they are reading.	2. Try to read books that might relate to the individual's own experience. Be it personal interest, past hobby, something familiar or in relation to his friends and family.
3. Use adequate language to make the book more personally meaningful and not just easy. Something that it's more adequate to their level of understanding and comprehension.	4. Try to use objects or external factors to attract and keep attention. Textures and bright colours might be interesting to take advantage of even with limited visibility.
5. Use large print and focus on the Braille as its own thing without interfering, allowing them to "find" words on their own without visual or tactile noise.	6. Engage with the individual after finishing the book or casually during the reading, find a common middle ground that works for the both of you, so it feels more casual and not as alienating.

Figure 40. Perkins School for the Blind, *"Eight tips to introduce reading to your young child who is blind"* [Article Excerpt].

Personal interest in the genre of reading materials is not heavily impacted by the ability to see or hear and depends more so on the individual's taste, the only aspects that could change its environment are the way it is presented and engaged with along its availability. The auditive or tactual effect on reading remains unchanged in their own forms, but they still provide the same silence and intimacy one might have in reading any kind of physical work privately. Resonating with its perceived reader differently than with an audiobook or other digital media.

This is true especially in older readers that depend less and less on their ability to perceive sound and more in the way they perceive things and people closely around them, losing motor capabilities and becoming more and more stagnant while also not engaging strongly with new technologies. There's also a strong case for deaf-blind individuals that can't engage with digital visor readers or audiobooks in the first place, providing them another way to read without depending only on senses that might also become more degraded by age.

BIAL Foundation. (2021). *Does blindness affect the way we perceive whether an emotion is authentic or posed?* Bialfoundation.com.

Sarzedas, J., Lima, C. F., Roberto, M. S., Scott, S. K., Pinheiro, A. P., & Conde, T. (2023). *Blindness Influences Emotional Authenticity Perception in Voices: Behavioral and ERP Evidence.* Cortex, 172.

Figure 41. Kampus Production. (2021). *An Elderly Man Reading a Book Beside a Woman* [Photograph].

5.3. READING SPEED & COMPREHENSION

It's balancing this duality of **intuitive vs objective** reading that the psychologists: Aries Arditi, Jeffrey D. Holtzman and Stephen M. Kosslyn, write in their article "Mental imagery and sensory experience in congenital blindness":

"Kerr, found that blind people could scan their images, requiring more time to traverse farther distances. Furthermore, the increase in time with distance was the same as that found for sighted subjects (...) Kerr took to indicate that the functional properties of "visual" mental imagery are not visual, but rather are spatial (...). For example, subjects could have used tactile images, imagining moving their hand along the imagined scene. Similarly, Kerr found that blind people took more time to inspect images of smaller objects, just as do sighted people"[29].

[29] Arditi, A., Holtzman, J. D., & Kosslyn, S. M. (1988). *Mental imagery and sensory experience in congenital blindness.* Neuropsychologia, 26(1), 1–12.

The study analyses both perceptions of visually abled individuals and blind individuals, and acquires proof that while strictly necessary for blind individuals, reading speed and comprehension seems to be unaffected and even the same as the general public when it comes to tactile comprehension vs strictly visual information in its assessment.

This means that if both information was available from the start of consultation, there would be practically no difference in reading speed or even understanding by the same piece of text for different people already skilled in their field of reading. Apart from some personal shortcomings or limitations of knowledge about topics unknown or uncommon to them, or being limited by their own disposition like for example its size or display material (Small images, reliefs and typography or even material too glossy or reflective - would difficult the reading comprehension of any subject independent of visual ability).

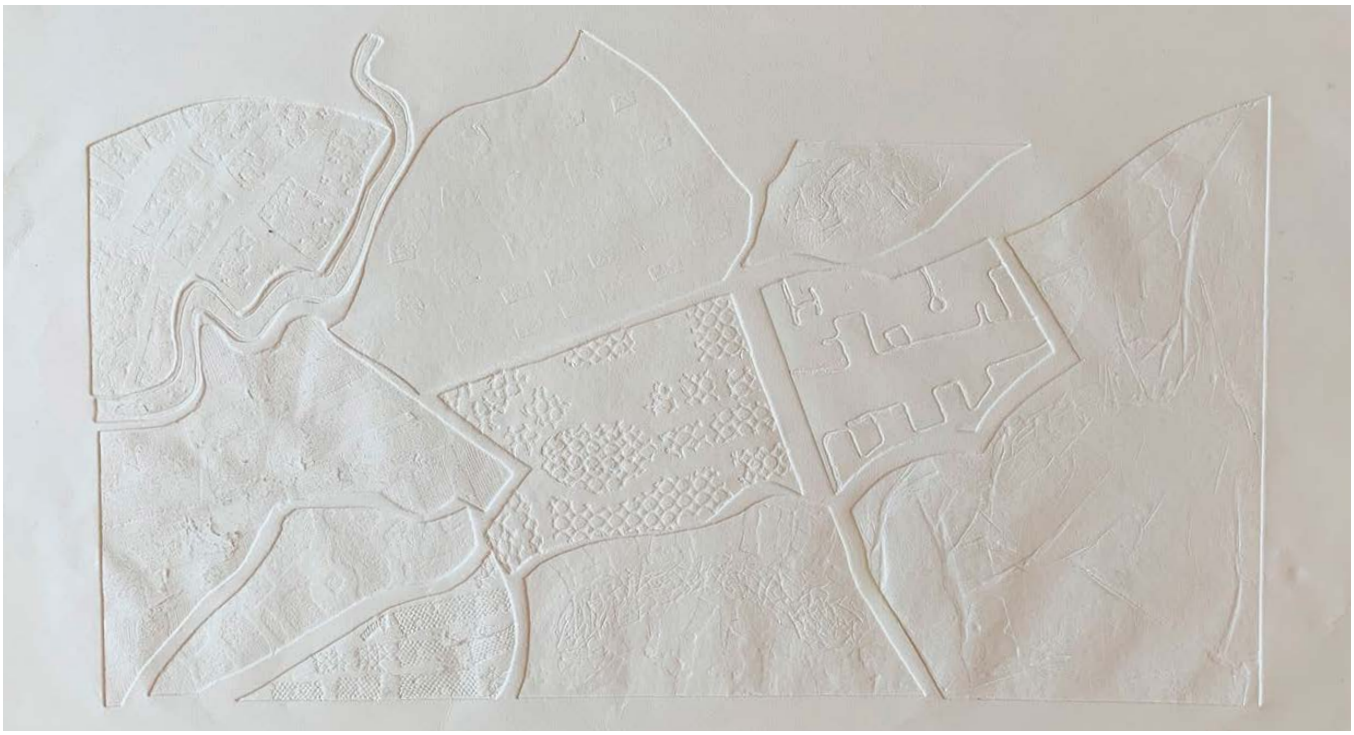


Figure 42. Edinburgh College of Art Degree Show. (2010). *Tactile Map: Edinburgh* [Blind collography using found materials].

"Students with a vision impairment started slower at reading single words than their normally sighted peers. (...) Single words were read faster than text. Reading speeds increased with increased visual acuity and with practice."[30]

Age and experience, like any other factor, also plays a big role in reading comprehension from a blind individual. Micheal A. Hudson while speaking about "Embossing Systems for Blind Readers" in his tour for the American Printing House for the Blind[31] mentions that while certain styles of Typography like Roman Letters are "no trouble" for children to learn and understand from a very early age, there's a certain confusion in older people that lose sight later in life, for discerning them from each other, after learning them beforehand visually.

This combined with studies about early-blindness vs late-blindness, like with the experiment "Adults' spatial scaling of tactile maps: Insights from studying sighted, early and late blind individuals"[32] where both groups are placed against one another with the same relief map and told to traverse it as fast and efficiently as possible: "Both groups of blind participants tended to learn the map faster than blindfolded sighted controls, and response times were also faster for blind participants than for blindfolded sighted participants. This pattern of results confirms previous studies in which blind people responded faster than sighted people in spatial tasks in the haptic domain".

[30] Loh, L., Mallika Prem Senthil, & Constable, P. A. (2024). *A systematic review of the impact of childhood vision impairment on reading and literacy in education*. Journal of Optometry, 17(2), 100495–100495.

[31] Letterform Archive. (2022, August 17). The Tactile Book: Embossing Systems for Blind Readers. YouTube.

[32] Szubielska, M., Szewczyk, M., Augustynowicz, P., Wojciech Kędziora, & Wenke Möhring. (2024). *Adults' spatial scaling of tactile maps: Insights from studying sighted, early and late blind individuals*. PLoS ONE, 19(5), e0304008–e0304008.

Helps to understand that while late-blind individuals tend to rely on direct mental visualisation, early-blind and/or visually abled individuals tend to trust more in past experience and proximate memory which can generate some confusion, for example, in the case of the Roman Letters.

In other words, people that are accustomed to not being able to see, or had the condition for a long time, rely on each piece of information as it appears to them momentarily, while people that might've lost that ability temporarily or in a short time might still rely on past memory and experiences to address each new information obtained. This is especially pertinent if we're referring to the subject of gradual blindness due to age, that while gradual, it still heavily relies on memory and past experience, if the individual isn't at a later stage already.

Having both visual information along with relief indentations and Braille available seems to be the most common point many projects and artefacts choose to take. That or offer the same piece in a strictly limited blind-friendly printed edition that due to its audience are always in shorter quantities or it's seeked out on demand by the individual.

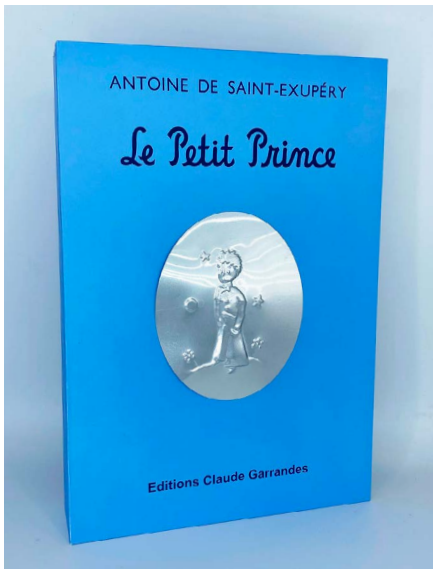
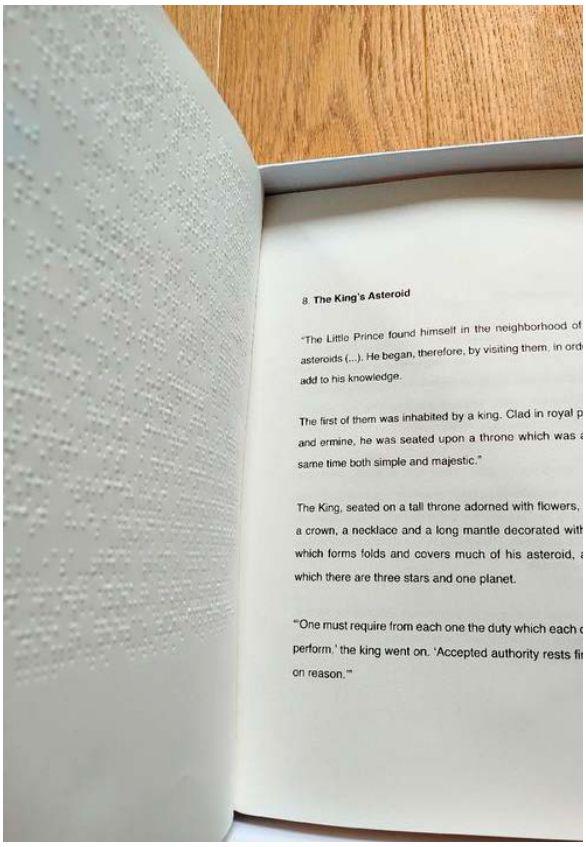


Figure 43. Le Petit Prince. (2022). *The Little Prince – Tactile Braille edition.*



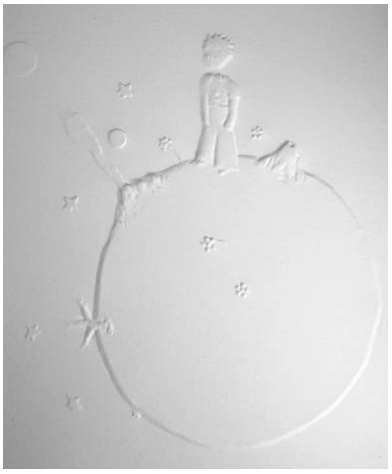


Figure 44 to 46. Le Petit Prince. (2022). *The Little Prince – Tactile Braille edition.*

Note. From Left to Right:

20. Page excerpt;
21. Detached illustrated excerpts;
22. "The Little Prince on Asteroid B 612" Excerpt page.

5.4. ATTITUDE & HABITS 7

Figure 47. Nilov, M. (2021). *Man Using the Braille in Front of a Computer* [Photograph].

While blind individuals face the same struggles and achievements any other people do, it's important to reiterate that there are some, if not more, issues related to topics out of personal control or personal ability during their lifetime in comparison to other parts of society as a whole. While not being strictly about blind individuals, the study/survey "*Pessoas com Deficiência em Portugal – Indicadores de Direitos Humanos 2023*[33]" came forward to say that in the year 2023, Portugal had 62.3% of its percentage of individuals with disabilities at risk of poverty in direct connection to 2022, if it were not for the assistance of social benefits.

[33]ISCSP-ULisboa . (2023). Pessoas com Deficiência em Portugal. Universidade de Lisboa.

Unemployment, lack of reliable resources, aid, commodities and/or technology are the biggest hurdles one must face as a blind individual, in Portugal, and around the world. These hurdles had been getting easier and easier to fight against by the decade but it's still a highly neglected topic when it comes to inclusivity in the public discussion.

According to the ICT technician and professor Wagner Maia, partially blind brazilian instructor of the course *Capacitar à Distância** : "Blind individuals need to be extra resourceful and 200% better at what they do if they want even a chance to compete (for a well-paid position anywhere)", "(...)Being resourceful it's just a first step, one can't be lazy or distracted from what is necessary, because if taken the chance, someone will be chosen over you".[34]

***Capacitar à Distância**, Capacitate at a Distance, in english.

[34]Maia, W. (2020, June 6). Recursos de Acessibilidade dos smartphones para deficientes visuais.

While **Memorization** is a skill that blind individuals train constantly: from their own keyboards and technical equipment, to their phones, credit cards, relevant personal information, and whatever is necessary for their daily activities: **Resourcefulness,** a skill that is often neglected to be mentioned, it's often times what makes an active blind individual be truly independent. The majority of Individuals that lose their eyesight later in life or too suddenly for preparation aren't predisposed to re-learn everything they did gradually, and so, are alienated from their previous lifestyle and previous learning habits.

Lucas, J., & 2022. (2022, April 27). *Blind people remember language better than sighted people do.* The Hub; Johns Hopkins University.

Arcos, K., Harhen, N., Loiotile, R., & Bedny, M. (2022). *Superior verbal but not nonverbal memory in congenital blindness*. Experimental Brain Research, 240.

Dr.Suzanne Hodge and Dr.Fiona Eccles, both from the Division of Health Research at the Lancaster University, write for The Thomas Pocklington Trust[35], a voluntary organisation that strives for equality of blind and partially sighted people in every aspect of society: "Loneliness and social isolation occur as part of a complex interactive process involving other factors, especially difficulties with everyday functional activities. (...) Loneliness is linked more strongly to how people experience their visual impairment rather than the clinical assessment of their vision; this highlights the importance of understanding people's personal experience of sight loss."

[35]Hodge, Dr. Suzanne., & Eccles, Dr. Fiona. (2014). Loneliness, social isolation and sight loss Research Findings.

There is a big tendency in individuals to try and 'hide', or at least drive away, attention from the impediment for **two** big factors:

People that are fully integrated with their condition and just want to score better and equal opportunities for their own life, seek independence while knowing and accepting their limitations, adapting themselves to the environment and taking what they can from it without imposing themselves on the people around them. And Early-blind individuals tend to want to avoid the subject altogether for associated fear of having the condition for the first time, exclusion from their peers, or a sense of alienation and helplessness that often reflects in their own person and character, especially in older individuals.

"A person with acquired blindness or low vision is often confronted with serious problems inherent to the psychological dimension (...) Braille is, in this process, a fundamental tool for access to knowledge and the inclusion of blind individuals, in a society that should be a place for everyone and open to all." Renata Salvado, Amaro Costa (2021)[36].

[36]Instituto Nacional para a Reabilitação I.P. (2021). *Compilação das comunicações apresentadas no seminário comemorativo do Dia Mundial do Braille de 2020.* Núcleo Para O Braille E Meios Complementares de Leitura, 978-989-8051-21-9.

When choosing or creating an artefact for these individuals it's important to be direct and not infantilize them in a way it makes the individual feel "otherworldly" or an "exception" to the societal norm, in a way being more appealing of the public at large while making it also accessible at the same time, not excluding them as default. Its form should be obvious and its communication clear without hand-holding the reader while letting them take information at their own pace. Not having a time limit or any outside pressure is also beneficial for Early-blind individuals that might feel bad in taking too long to access information, providing them a safe space to practise.

Figure 48. Unknown Author. (2017). *Elderly women reading with a child - CC0 Public Domain* [Photograph].

Figure 49. Agrupamento de Escolas de Ílhavo.(2022). *Portuguese Sign Language, "Commitment"*. [Video Screenshot].

6. BLIND HISTORY

To understand the state of what's available at this moment, we need to take a pointed look at the condition as a whole. That includes where it currently resides in the public consciousness and how it affects day to day activities for individuals who do have it. Historical records will be used generally to contextualise its evolution, and not degrade or invalidate any specific set of individuals, but it's warned that some topics of ableism will be discussed as it pretends to be a real and necessary discussion to take into account for this subject. Reader discretion is advised.

Illingworth, W. H. (1910). *History of the Education of the Blind. Hardpress Publishing*.

Sousa, A. A., Todorov, O. S., & Proulx, M. J. (2022). *A natural history of vision loss: Insight from evolution for human visual function*. Neuroscience & Biobehavioral Reviews, 134(104550).

Figure 50. Bruegel, P. (1568). *The Blind Leading the Blind* [Distemper on linen canvas].

Blindness as a whole has existed with humanity from the beginning of time, appearing as a physical condition in newborns due to genetic disposition or later inflicted during its individual lifetime. While having this condition inflicted or gradually appearing with age was expected and brought its own set of societal expectations and assumptions, infants born with these conditions were extremely rare and frequently non-existent in primitive societies due to their highly dangerous lifestyle, death at birth or abandonment from their own communities.

This was due to many reasons, from lack of resources available, difficult life conditions, religious beliefs, possible divine retribution, less than desirable competence for manual work or the assumed failure of expected tasks that might've been required of them in their own inner circles. A child that fit the predetermined norm was accepted while one that lacked decisive attrib-

utes, like in this case sight, was pushed to the side and/or considered subhuman, a treatment that was considered normal and in accordance with the ruling powers. In the middle ages there was a growth of the idea of blindness as a punishment, something that could be taken away as a fair trade for committing crimes or as an indication of personal and societal weakness. During war times it was particularly common to send soldiers back to their homelands wounded in some way, more frequently partially or completely blind, but just debilitated enough so they wouldn't pose a threat if they wanted to retaliate and still send a message to their warring neighbours.

At the same time that a general increase of blind individuals was happening due to punishment or subsequent health decay caused by natural and/or external factors, Christianity was also gaining more and more traction as the main religious institution in Europe. In this new ideology of Anthropocentrism, or idea of the human being above all, blind individuals despite their own physical limitations were seen as equal human beings to their own societies for the first time in recorded European history.

This change, despite its biggest strides into full equality, was quite reserved. The same institutions that preached for their innocence and protection were the same ones that were harbouring them out of the public eye and conscious. Isolating them and including them in their own predetermined places and roles. This offered just different limitations to what they had available until then but the processions were still common for individuals that were living outside these circles.

Seal, J. (2022, October 26). *Revelations of blindness in the Middle Ages*. Wellcome Collection.

National Federation of the Blind. (1974, July 3). *Blindness: Is Literature Against Us?*.

Figure 51. Yates Thompson. (1290). *Cistercian nuns in chapel (La Sainte Abbaye)* [Medieval manuscript].

Another big step towards true equality is located in the Renaissance, with the feudal powers now gone and the start of mercantilism, the predecessor to our current capitalism, modern ideas started to take root. Individualistic skills and characteristics are being rewarded accordingly to their usefulness and their own specialised pre established circles. This gave even more power to individuals that felt excluded before as it offered them niches that could be taken advantage of as well as some recognition for their own beings and ideas.

A person of relevance with a physical limitation turned a lot more common, and seen as just an aspect of the person as a whole, instead of being its own separate category. From the eighteenth century onward society views blindness in a more pragmatic sense. With the Age of Enlightenment, society as a whole advances in the fields of science and medicine, blindness as a condition is finally studied as just that - a condition. With the most extreme of negative light cast upon these individuals being prejudice to just plain ableism instead of persecution or punishment.

Equestri, A. (2022, March 23). *Literature and Disability in the English Renaissance.* Oxford Research Encyclopedia of Literature.

Willings, C. (2022, June 18). *Timeline of Visual Impairments. Teaching Students with Visual Impairments.*

Research to Prevent Blindness (RPB). (2014). *Short History of RPB.*

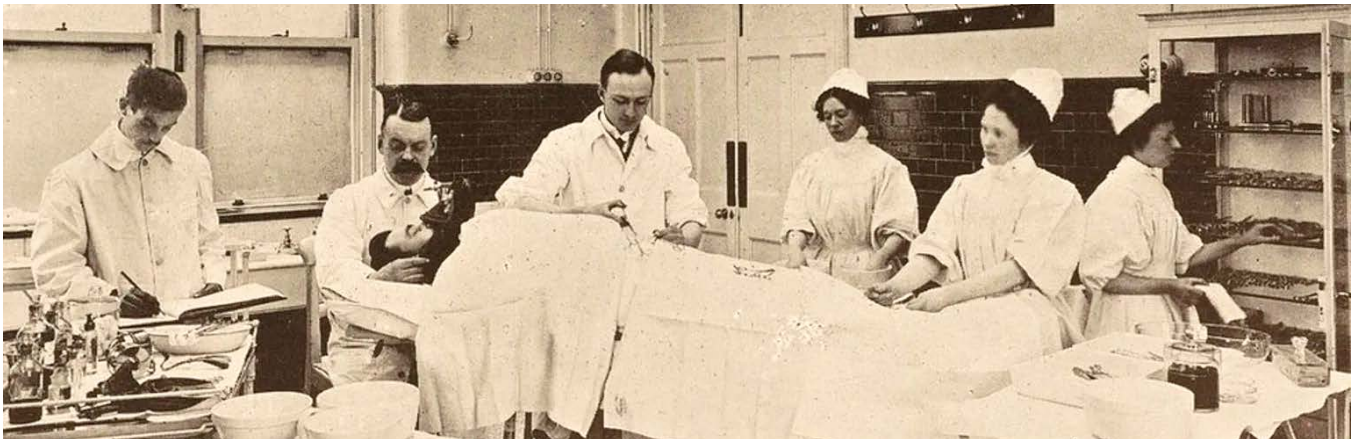


Figure 52. BBC. (2020). *An operation being carried out at the hospital* [Photograph].

Studies of treatments for the condition started and were discussed in this time, and even if not successful or very limited in doing so, it brought a clear understanding to the doubts that were always present to the individuals that did have it through history, helping in some crucial cases like discomfort or possible harm related to more aggressive conditions while also making it being generally more accepted overall.

Systems of writing for the visually impaired are invented and spread, circles of blind intellectuals and students are created and education becomes more available than ever for the general population, making them consequently more included and overall on par with general expectations. Academies, institutes and specialised education are more available to whoever needs it and the condition is fully integrated by the end of the century in the societal consciousness as just a debilitating aspect.

Note. For more information about the topic of Blindness in Academies and Schools see chapter 7 “Blind Writing and Editorial Systems”.

In 1878 the International Congress, in Paris, decided that Braille should be adopted and standardised as the universal teaching method for the blind, and by the twentieth century, the idea of all blind individuals sharing learning spaces with other students it's brought forth. This leads the way to other spaces possibly including assistive aids, as well as including them in other shared spaces.

World War 1 and 2 came to reinforce what was discussed previously as international governments wanted their wounded soldiers to reintegrate into society. From the conditions caused by war - visual, auditory or mobility aids became even more available and common to the general public. These conditions came to be more normalised in day to day spaces and services and contributed to these becoming even more integrated in the long term.

The **WBU**–**World Blind Union**–is the worldwide organisation that represents the blind, with members representing institutions that advocate their cause, spread across 190 countries. **The United Nations Enable**, which published the "United Nations Convention on the Rights of Persons with Disabilities" (UNCRPD), the **World Intellectual Property Organization (WIPO)**, among other national and international institutions, also follow the same path, advocating for Braille as the reading and writing system of choice for this group of users.

Braille Works. (2013). *History of Braille - Braille Works*.

International Encyclopedia of the First World War. (2014, October 8). *War Losses (Germany)*. 1914-1918-Online (WW1) Encyclopedia.

World Blind Union. (2016). *History: World Blind Union*. Worldblindunion.org.

Figure 53. Sargent, J. S. (1919). *Gassed (London, United Kingdom)* [Oil on canvas]. Imperial War Museums.

6.1. BLINDNESS CONTEXT (PORTUGAL)

In Portugal, **Branco Rodrigues** provided the first recorded training on the Braille system for the newspaper he directed (1895—1920), called the *"Jornal dos Cegos"*[37]. The method and instruments for its study appeared in **vol. IV** (1896) where the article "*O sistema Braille**" is included. It explained what it consisted of, its relevance, how it was being applied worldwide and informed that in the United Kingdom all existing works for reading by the blind had just been printed in Braille, until then only available in the English Frere and Moon systems.

With this periodical, practical teaching of Braille was recurrent: The **vol. IX** (1904) is entirely dedicated to the Method of reading and writing for the blind and the **vol. XXIII** (1919—20) includes the text Braille system for the alphabet and numbering, roman numerals, musical notation, Stenographic method, and Synoptic table of word abbreviations.

Ferreira, C., & Graça, A. (2015). *A Área de Leitura para Deficientes Visuais da Biblioteca Nacional de Portugal: um estudo de caso.*

[37]Câmara de Lisboa. (2015). *Jornal dos cegos : revista de educação e ensino intellectual e profissional dos cegos* [1895-1903].

***Jornal dos Cegos**, Newspaper for the Blind, in english.

***O sistema Braille**, The Braille System, in english.

1.º Anno — Novembro 1895 — N.º 1

JORNAL DOS CEGOS

Revista de educação e ensino intellectual e profissional dos cegos

Todos os lucros d'esta publicação serão offerecidos pelo seu redactor á benemerita Associação Promotora do Ensino dos Cegos

ESCRIPTORIO	REDACTOR	PUBLICAÇÃO MENSAL
Livraria Catholica, Rocio — Lisboa	BRANCO RODRIGUES	Assignatura por anno 500 réis

La science et la philanthropie ont déjà fait beaucoup pour les aveugles; mais la dette de l'humanité est loin d'être payée.
M. DE LA CHATRE.

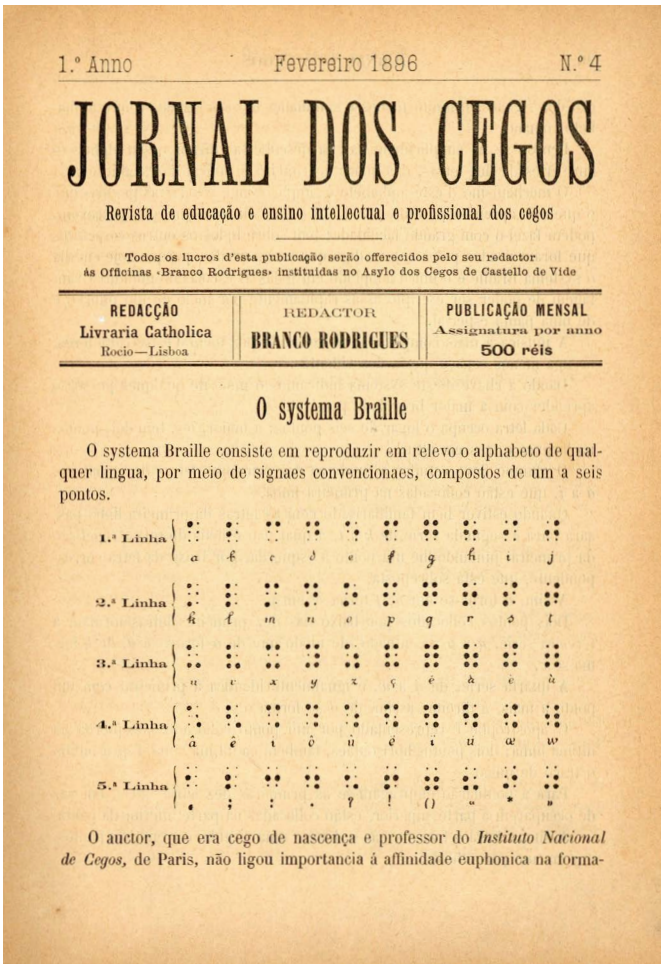
O ensino dos cegos em Portugal

Apesar de Portugal ser a unica nação da Europa, onde não existia officialmente o ensino dos cegos e de ser a ultima a ministral-o, nem por isso o nome do sr. conselheiro João Franco, o benemerito homem de estado que decretou esse ensino no nosso paiz, deixará de ser memorado na lista gloriosa aberta pelo nome de Valentim Hauy, o fundador em Paris, da primeira escola de cegos, que existiu no mundo.

*

No primeiro numero d'este periodico não podia deixar de prestar a devida homenagem ao illustre ministro, que, póde dizer-se, é o iniciador do ensino dos cegos no nosso paiz; não podia deixar de lhe consagrar a primeira pagina d'este jornal, para que no futuro, quando alguem

CONSELHEIRO JOÃO FRANCO
Ministro que decretou o ensino dos cegos em Portugal



1.º Anno — Fevereiro 1896 — N.º 4

JORNAL DOS CEGOS

Revista de educação e ensino intellectual e profissional dos cegos

Todos os lucros d'esta publicação serão offerecidos pelo seu redactor ás Officinas «Branco Rodrigues» instituidas no Asylo dos Cegos de Castello de Vide

REDACÇÃO	REDACTOR	PUBLICAÇÃO MENSAL
Livraria Catholica, Rocio—Lisboa	BRANCO RODRIGUES	Assignatura por anno 500 réis

O systema Braille

O systema Braille consiste em reproduzir em relevo o alphabeto de qualquer lingua, por meio de signaes convencionaes, compostos de um a seis pontos.

1.ª Linha — a b c d e f g h i j

2.ª Linha — k l m n o p q r s t

3.ª Linha — u v x y z ç é à è ù

4.ª Linha — â ê î ô û ë ï ü œ w

5.ª Linha — . ; : ? ! ( ) " * »

O auctor, que era cego de nascença e professor do *Instituto Nacional de Cegos*, de Paris, não ligou importancia á affinidade euphonica na forma-

Figure 54 and 55. Rodrigues, B. (1895). *Jornal dos cegos n.º1 and 4* [Newspaper]. In Lisbon Municipal Digital Hemeroteca.

In the first half of the twentieth century, other pioneers led to the deepening of the use of Braille in Portugal, which has led to, in 2015, 10 to 15% of blind and partially sighted Portuguese people mastering it and using it fluently. Based on recent technological developments, the "Braille line" enables access to a variety of information using personal computers (with Bluetooth) and also mobile phones. A specific application has also been created by several manufacturers, commonly known as a screen reader, with the most commonly used products in our country being **JAWS** and **NVDA** for Windows, **ORCA** for Linux and **VoiceOver** for Apple products.

Today, if requested for the first time and if a person is already associated with a verified national specialised organisation, like **ACAPO** or **APEC**, the first assistance kit, also denominated **SAPA**[38], a person receives in life is free by the government. There's only two ways to receive these kits: being legally considered blind—or have a significant visual impairment—or for educational purposes like being part of a course or to receive additional certification.

[38]ACAPO. (2024). *Produtos de Apoio. Associação Dos Cegos E Amblíopes de Portugal.*

Figure 56. ACAPO. (n.d.). *ACAPO Logo*. In Águeda Local Delegation Website.

Each kit is verified, by a certified professional, being only necessary to provide the responsible organisation with some personal information like height, weight and personal degree of impediment. These informations will only be used for personal authentication and tool personalization, the kit containing, but not being limited to: an adjustable walking cane, a personal slate and stylus for Braille, a amplified monitor or specialised reader (like a magnifier glass) and an additional device for digital text, with more specialised items only being included depending on the severity of the condition and personal motor skills.

Private companies like **Sertec**[39] and **MegaPontes**[40] offer extra non-contributed options that can be purchased by the general public, but it's generally advised by specialists to find free contributed options when available that might be already in circulation for auxiliary purposes.

[39]Sertec. (n.d.). *Informação e orientação para pessoas com deficiência Visual.*

[40]MegaPontes. (n.d.). *MegaPontes - Tecnologia Acessível para Cegos / Baixa Visão.*

7. EDITORIAL HISTORY FOR THE BLIND

For as long as humans had the practical need to keep record of their activities and preserve written knowledge for prosperity, physical, more specifically paper, records have been a big part of the process, as it was the most proliferated, practical, and functional form of physical communication and preservation before the digital ages.

Kelly, L. (2015). *Knowledge and power in oral cultures.* Cambridge University Press.

The future of the media It's heavily debated today, especially in the face of the new coming tech-savvy generations, but despite its declines and growths, it still forms a strong base of our society today. Its importance is still unmeasurable and necessary, and its use is still felt today to varying levels and effects.

This study will not delve into this matter or provide a definitive answer to this debate. But it might bring an interesting point and experience that might only be possible to perform in the physical media of an editorial artefact. Keeping this in mind, it might be used as proof that there might still be some value to the medium after its initial intended usage becomes obsolete.

Communication itself, despite its temporary universal preferred form of record, takes many different shapes depending on its many local colloquialisms, that to this day, we can still observe in the way we each differently speak and write. Be it the many different languages that exist, to very specific symbols, codifications, sayings, and traditions—all these are born from very specific and local forms of oral tradition and societal expectations—that we still use and re-use in some way to their desired effect.

Many people, even in modern times, try to preserve both oral and written traditions, as well as other teachings passed down from generation to generation, ensuring that they don't lose their implied meaning or connotations that might be important for later context. Without this effort, future generations might find these bases alienating, lost, or only having available the bare basic descriptions without the proper background to make them interesting or relevant.

Words in this sense are like people, always changing like their users, adapting and fitting certain purposes through their cycle, and never being stagnant for too long unless obsolete or changed entirely to fit into newly created objectives.

But how did these structures even form for blind individuals in the first place?

How can a piece of information be adapted and portrayed in a physical medium only?

What was their primary purpose, and how did they worked in unison with the technology they had available?

Do these portrayals even need to change or adapt for modern times?

This specific part of disabled history is very neglected in some cultural conscious aspects, perhaps because we don't use it frequently or have a very basic or skewed perception of how it came to be, only knowing its destination and paying no mind to how it was created or the changes it did suffer to reach this clear-cut set of rules and guides we use today.

Journal of Blindness Innovation and Research. (2018). *The Association between Braille Reading History and Well-being for Blind Adults*. NFB; JBIR.

Edwards, P. (2022, April). *Blindness Culture: Reimagining Who We Are*. American Council of the Blind.

A factor one must have in mind when speaking about the subject of language and semantics for the blind is that no language or form of written expression was born linearly and pointedly in a specific time or place. One might have the best form of the process categorised and preserved in its entirety in one instance, but it will never be able to provide all answers or fit every single form of writing ever found or created to this day equally. We can only observe what survived to modern times, was used in mass to a specific desired effect or goal, or was used to such a standard that we can safely assume its utility and usage.

These readers are, by themselves, a smaller and not as well recorded part of our history that, by cultural discrimination, simple disinterest or heavy specialisation was left neglected or not well categorised by many years. Only having certain characteristics or strong bases covered by word-of-mouth recollections or written records found and collected later to their origin.

Keeping this in mind, there will now be a general overview of how certain systems, like, for example, Braille, came to be and how they adapted and changed over the years, as well as any important or relevant information that might be interesting to add or is intrinsically linked to the final artefact historically or contextually.

Figure 57. The British Museum. Sumerian Cuneiform Tablet, Shuruppak (ca.2500 BCE).

BLIND WRITING AND EDITORIAL SYSTEMS

7.1. ANCIENT WRITING, B.C.E.

Every writing system known today has its origins primarily traced back to ancient civilizations, or approximately 3500-3000 B.C.E. (Before the Common Era), Blind Writing Systems are no different in this regard.

Writing is generally traced back to the Sumerian cuneiform, a form of writing that used a reed stylus to cut wedge-shaped marks on clay tablets. But it's just one of the many ancient methods that started being developed around the world in different countries and cultures, from the Egyptian Hieroglyphs, the Maya scripts and Quipu records to the Linear B Mycenaean Greek.

Is implicit by each unique shape and its disposition that certain marks carry their own set of meanings and objectives, but an important fact that often causes inattentional blindness[41] to the general viewer is that they are purely tactile by their own creation. From modest clay tablets to monumental wall carvings, every method is used to create a mark that any person, even a blind individual in this case, could read if they had previous knowledge about its usage. While learning to read or receiving an education was prohibited and discouraged in ancient times for certain ethnic groups, genders, social classes, and lower hierarchy levels—such as the Egyptians who viewed disability as a curse from the gods—this idea of tactile reading has survived to modern times and has influenced our understanding of how writing systems can be adapted to these groups and used functionally to a positive degree.

Letterform Archive. (2022, August 17). *The Tactile Book: Embossing Systems for Blind Readers*. YouTube.

[41]**Inattentional Blindness:** A failure to notice unexpected but perceptible stimuli in a visual scene while one's attention is focused on something else in the scene. This phenomenon occurs even when items are visible for several seconds.

Figure 58. The British Museum. Royal temple lintel of Amenemhat III [Relief].

7.2. FRANCE, 1785

The first school for blind children in the world, *L'Institut national des jeunes aveugles**, was founded by Valentin Haüy in the eighteenth century (1785). He had lived in a time where homelessness and poverty were common on the streets, and many children and adults didn't have the funds to receive a proper and complete education, especially disabled people that were still commonly seen as "others" and an eyesore to the common person at the time.

According to scholar Micheal A. Hudson[42]: "He had a kind of a Epiphany on the streets of Paris in 1781 when he had stumbled into a street tavern where a number of blind people had been paid by the proprietor to dress up in clown outfits (...) and play music instruments badly, and be mocked and laughed at, it had basically been their job." This story is often retold and recorded as the school's origin story, a school that is still open today.

He starts this school with one student, a 17 year old blind beggar boy named *François Lesueur*[43], to start trying to find successful methods of instruction. While under his tutelage, it was the student's job to pick up letters and mail for both his teacher and the school respectfully, he noticed after some time that he could recognize some of the letters because of their different embossment and that gives his teacher the idea to create a special type font that could take advantage of this and later even help his students to emboss their own books.

APH — American Printing House for the Blind. (2021, May 11). *First Raised Letters: Early Efforts in Embossed Line Type*. Youtube.

[42]Letterform Archive. (2022, August 17). *The Tactile Book: Embossing Systems for Blind Readers*. YouTube.

W. H. Illingworth, & American Printing House for the Blind, I. (1910). *History of the Education of the Blind*. In Internet Archive. Sampson, Low, Marston and Company, Ltd.

[43]Erzilbengoa, E. (2023, January 8). *L'histoire du dimanche - Avant l'invention du braille, Valentin Haüy fondait en 1785 la première école pour aveugles à Paris*. France 3 Hauts-De-France.

***L'Institut national des jeunes aveugles**, National Institute for Young Blind People, in english.

Figure 59. APH. (1993). *Portrait of Valentin Hauy*. [Photo Illustration Portrait].

Figure 60. *Large French Green Wax Seal*. (1700). [Photograph]. In Monahan Papers.

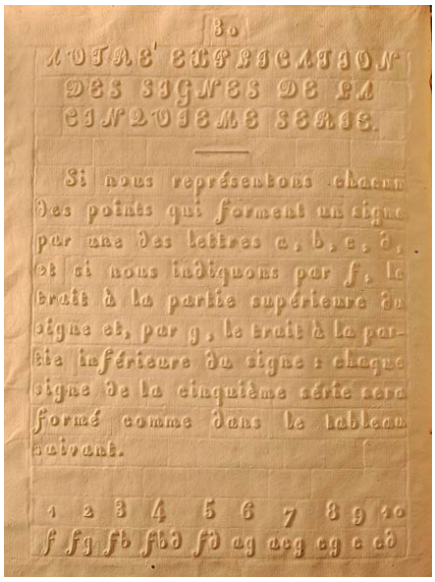


Figure 61. N.F.B. (1829). *Example of raised letter system used by Haüy.*

The first complete published book by the school is the *"Essai Sur L'Education des Aveugles*"* in 1786, by the sole authority of Valentin Haüy for his own school. It uses a big, highly serifed, complex font that looks just like a slightly exaggerated version to what would've been available at the time for other types of book. Printing using movable metal types in Europe was the standard at the time, and embossing letters came with its own specific set of metal types, that printers used frequently for the previously mentioned seals and letters.

***Essai Sur L'Education des Aveugles**, Essay on the Education of the Blind, in english.

He was able to demonstrate with this book that it was possible to teach the children how to read and it even gave instructions on how the students could create their own books by explaining the whole process of embossment as well as how to approach book making and use the school's equipment.

This is historically considered the first letter raised book of its kind, but unfortunately, due to how books were bound so tightly, its spine and cover being so hard as well as the copies found being stored in not ideal spaces and conditions, any copy in existence lost its relief entirely, leaving only the ink it once had complementing it.

With each subsequent book released throughout the ages, the spine would become much bigger in contrast and sometimes have extra spacers bound to try and alleviate some of the pressure as to not damage the internal relief, but this is only discovered after many copies with relief are damaged by time and that itself might've made many works lost to time. This had been by then an experimental book, so mistakes like these would only be recognized a long time later, but it was a significant step to how society could tackle this issue moving forward.

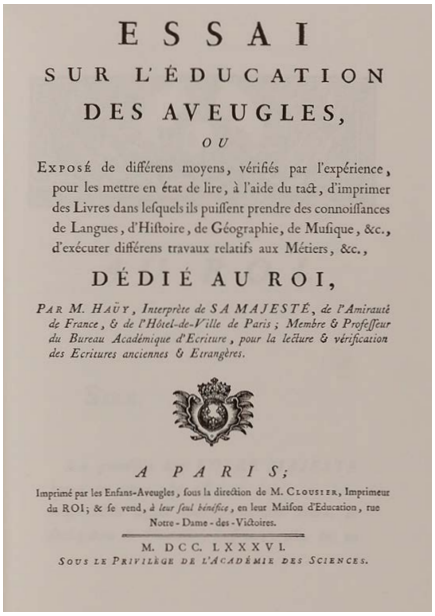

ESSAI
SUR L'ÉDUCATION
DES AVEUGLES,
OU
Exposé de différens moyens, vérifiés par l'expérience, pour les mettre en état de lire, à l'aide du tact, d'imprimer des Livres dans lesquels ils puissent prendre des connoissances de Langues, d'Histoire, de Géographie, de Musique, &c., d'exécuter différens travaux relatifs aux Métiers, &c.,
DÉDIÉ AU ROI,
PAR M. HAÜY, Interprète de SA MAJESTÉ, de l'Amirauté de France, & de l'Hôtel-de-Ville de Paris; Membre & Professeur du Bureau Académique d'Ecriture, pour la lecture & vérification des Ecritures anciennes & Etrangères.
A PARIS;
Imprimé par les Enfans-Aveugles, sous la direction de M. Clousier, Imprimeur du ROI; & se vend, à leur seul bénéfice, en leur Maison d'Education, rue Notre-Dame-des-Victoires.
M. DCC. LXXXVI.
Sous le Privilège de l'Académie des Sciences.

Figure 62. Bibliothèque Diderot de Lyon. (1817). *Notice historique sur l'Institution Royale des Jeunes Aveugles.*

7.3. ARBITRARY SYSTEMS 6

After Valentin Haüy proved his success in teaching blind children in Paris, news of his methods spread throughout Europe. Many early typographers tried to create their own systems, in a very local fashion, using the knowledge they had previously acquired from their craft to provide what they deemed better solutions to Haüy's heavily serifed font.

This originated in the creation of many specialised relief fonts that didn't obey the same rules or had any mutually strong structures between them. Some of them even had their own unique way of displaying their letters like for example the typographer James Gall (1831) that chose to geometrize each letter to its simplest and angular form, or John Alston (1832) the director of the Glasgow Asylum for the Blind, that instead of creating separate modules for upper and lower case, only used capital letters from already commonly available fonts.

While intentionally well meaning, it proved alienating to different blind communities in Europe that had already created their own systems themselves or relied only on memorization and didn't find it in their time to learn different ways of representing characters in a time where learning to read by itself was rare. These type fonts ended up only being used sporadically by blind individuals, the roman alphabet being the most frequently used throughout Europe, while serving more as embellishments for the general public.

John Alston font in particular, an adaption of a Dr.Fry's sans serif version of the roman alphabet, came later to prove that serifed fonts weren't exactly better than not-serifed fonts when it came to readability for low vision individuals, and could be applied just as strongly if applied with extra thickness and size.[44]

APH — American Printing House for the Blind. (2021, May 11). *First Raised Letters: Early Efforts in Embossed Line Type*. Youtube.

Letterform Archive. (2022, August 17). *The Tactile Book: Embossing Systems for Blind Readers*. YouTube.

NYISE. (n.d.). *Gall, Alston, Lucas & Moon*. The New York Institute for Special Education.

Mills, P. V. (1965). *Thomas Lucas and his embossed stenographic characters*. British Journal of Ophthalmology, 49(9), 485–489.

National Institute for the Blind. (2016). *A History of Blind Welfare in England and Wales*. Internet Archive.

[44]GlasgowLife. (2019). Alston - Glasgow Libraries Online Library. Csglasgow.org.

In England by the late nineteenth century, two instructors tried to create their own alphabets, independent of the already existing embossed roman letters used by their predecessors.

Thomas Mark Lucas, around 1830—32, invented a tactile alphabet system based on a then popular shorthand system used primarily for quran notes and quick dictation. It was constructed on arbitrarily chosen symbols for each letter, some strokes had a dot at the end while others did not. Consequently, it was not widely used except around his local region, but it was the first shorthand system for the blind to be invented before others, like Braille itself.

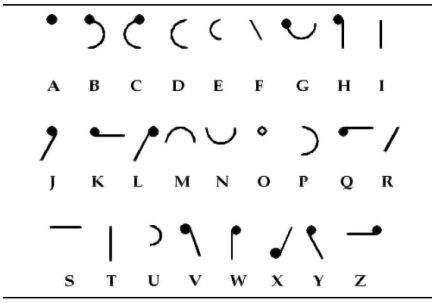


Figure 63. Lucas, T. (1838). *Lucas Tactile Alphabet System.*

William Moon lost his sight at age 21 and became a local teacher for blind children. A bit later around 1845, he invented a system because he noticed the children he teached had difficulties learning embossed reading codes used throughout Europe at the time.

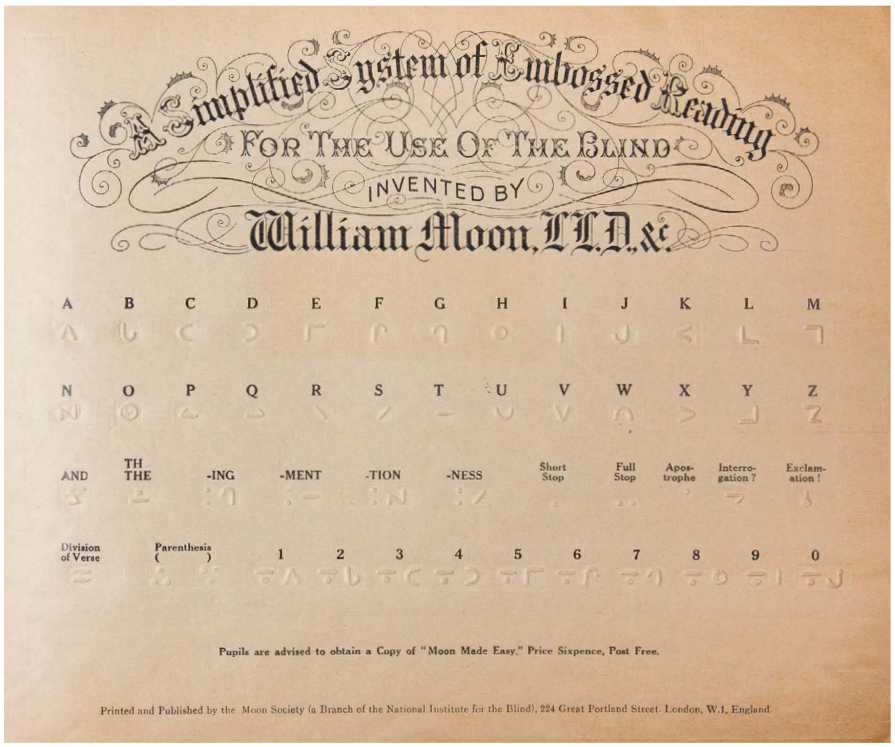


Figure 64. Moon, W. (1938). *Moon Tactile Alphabet System.*

The moon system is considered a hybrid between an alphabetic and arbitrary system because he assigns tangible roman shapes to certain letters and numbers while creating unique shapes and symbols for others deemed “difficult”. The goal was to be better tangible and readable than conveying the most direct reading of the original letter.

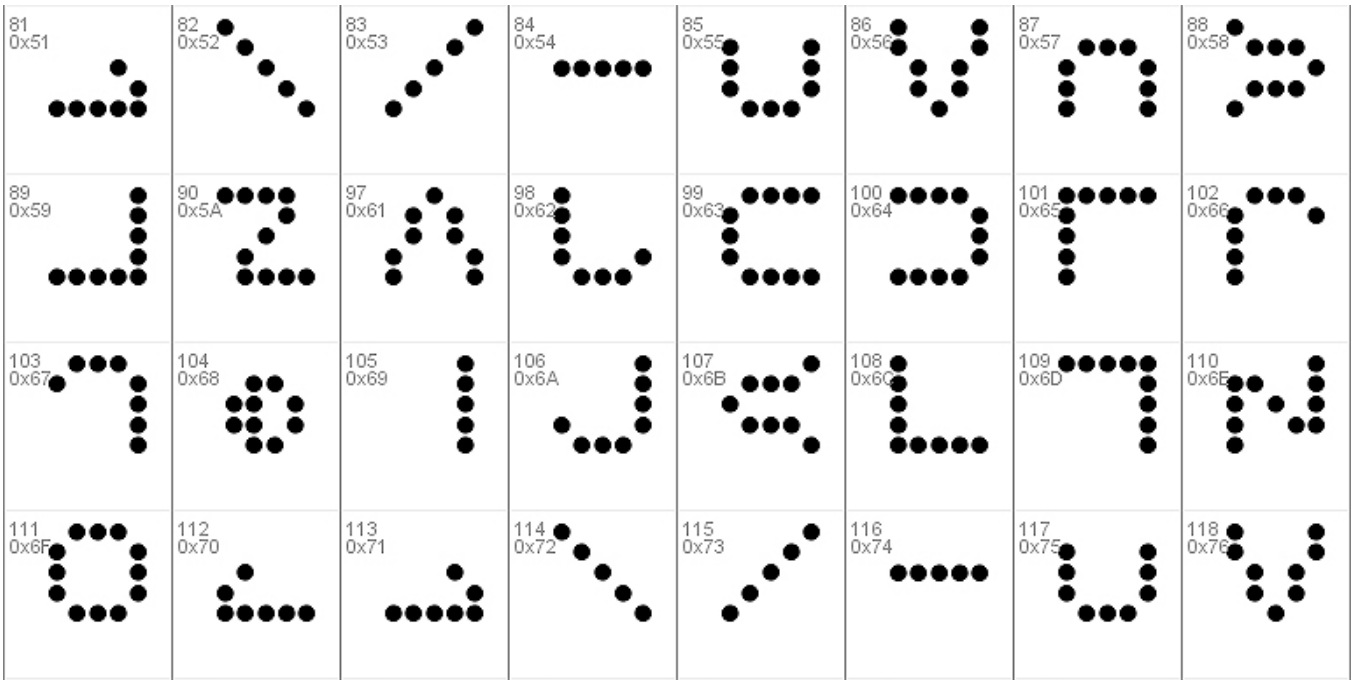


Figure 65. Falexoo. (2014). *Dotty-Moon Font* [Braille Font].

"There are people still reading Moon type even into the 21st Century, and only recently [specialists] just continued Moon type." said Micheal A. Hudson (2021)[45]. "Dotty-Moon", is the digital and printable version of the moon system, being able to be used by 12 languages[46].

A debate started at the time by these two systems in Europe - should the teaching of the embossed roman letters prevail over other more tangible systems by its numerous usage or should it be abandoned in favour of an easier readability for its audience.

[45]APH — American Printing House for the Blind. (2021, May 11). *First Raised Letters: Early Efforts in Embossed Line Type.* Youtube.

[46]Fakoó, A. (2014). *Dotty-Moon шрифт.* Online Fonts.

7.5. BRAILLE

Louis Braille was not born visually impaired in 1809. He became completely blind early in life due to an accident at his father's leatherworking shop. Fortunately, he lived in France, where the world's first and only school for the blind was located at that time and he was lucky enough to be accepted as a student. Considered incredibly smart for his age, at 12 he comes into contact with a dot code by Charles Barbier that had been recently teached at the school, the so-called "**Night Writing**".

Royal Blind. (2019, April 8). *Who was Louis Braille? | National Braille Week*.

Valentin Haüy Association. (2016, July 5). *"Braille 1809-2009" Writing with six dots and its future.* Association Valentin Haüy.

Much of what we know about **Charles Barbier** (1767–1841), according to a canadian researcher named Philippa Campsie[47], is false. Many of the papers we had in the past about the man had been folklore, according to Micheal A. Hudson, a professional that read the papers and summarised that what we know is basically the result of early authors only copying each other through time without focusing on its origin.

According to Philippa: Charles Barbier, often described as a soldier, might have only been a soldier for a few days having to flee the country prematurely to America because of the french revolution, as he was an aristocrat. He teached French and shortly served there as a professor at Transylvania University in Lexington, Kentucky, where he first started to develop his system. In 1803 he returned home after Napoleon granted all aristocrats amnesty, and his system ended up spreading to France's Royal Institute for Blind Youth, the school where Louis Braille attended. The Night Writing system could be described as a dot system that uses up to 12 dots, 2 columns of 6 dots each, that instead of basing his code on the alphabet it's more heavily based in phonetics, or the way words are pronounced.

[47]Campsie, P. (2021). *Charles Barbier: A hidden story.* Disability Studies Quarterly, 41(2).

Letterform Archive. (2022, August 17). *The Tactile Book: Embossing Systems for Blind Readers*. YouTube.

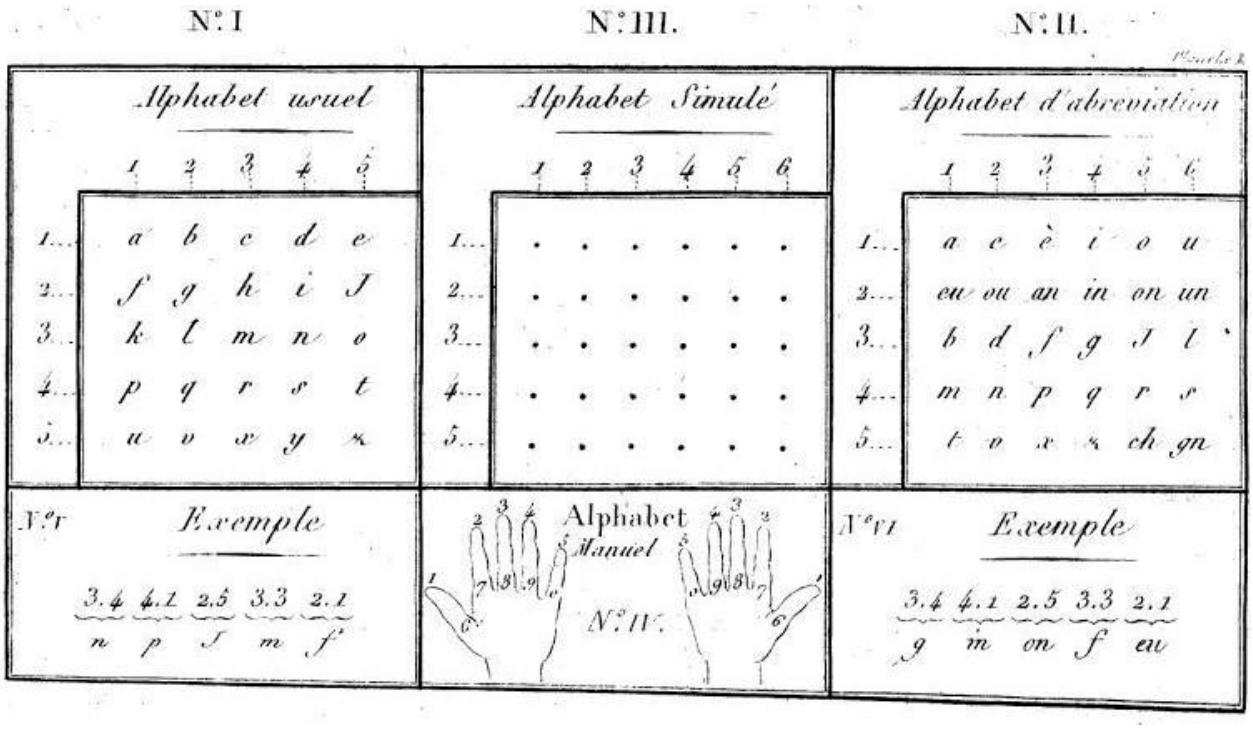


Figure 66. Campsie, P. (2021). *Essai sur divers procédés d'expéditive française of 1815* [Screen Printing]. In Charles Barbier: A hidden story.

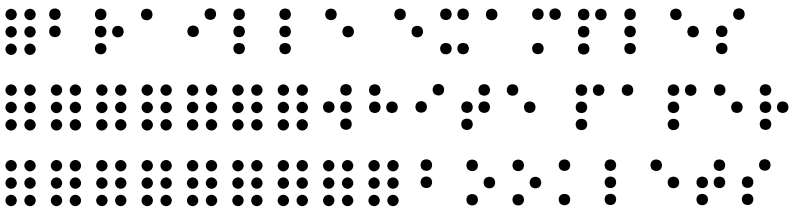


Figure 67. Author. *Real Size of Braille on paper A4.*

7.5. **BRAILLE** (PART 2)

Louis Braille, like his fellow students, embraced the code as it allowed them to finally take notes in class, something that was impossible until then due to the embossed letters, that were difficult to write fluently as words were spoken to them. Louis discovered with practice some of the flaws the Night Writing code had: the twelve dots took up too much space, it was slow to write for certain characters and they didn't fully fit the finger while reading. And because it was a phonetics system you couldn't also spell letters individually, something Charles Barbier tried to correct later but it didn't reach the schools before then.

Between the ages of 12 and 15 (1824) Louis redesigned the code to be of 6 dots, the one we use today, based entirely on the alphabet and came up with a punctuation system that fit those same constraints including even capitalization, vowels and numeral systems. He published his first book at 20, "*The Procede*" in 1829, translated to "The method for writing music, words and plain-chant by way of dots". The book itself, due to the systems in place at the time, still had the raised letters system prevalent, as he wanted a way to spread his method to his fellow students that had only learned this method beforehand.

Louis Braille developed his code by pressing a stylus into a slate. This slate was a simple tool, typically made of two wooden or metal pieces connected by a hinge. A writer would place thick paper between the parts of the slate that had cells that guided the individual to press the stylus down to create indentations on the paper. To ensure the text could be read from left to right, users had to write in reverse and mirrored.

Once the paper was flipped over, the dots would align correctly for reading. Although using a stylus proved to be slow, it was groundbreaking at the time and remained the most effective method until machines were specifically invented for this effect.[48] The average reading speed for Braille, even in the twenty-first century, is 125 words per minute, with the potential to reach up to 200 words per minute in adept readers.

[48] American Printing House. (2024, April 24). *Blindness History Basics: History of Braille Writers | American Printing House*. American Printing House; APH.

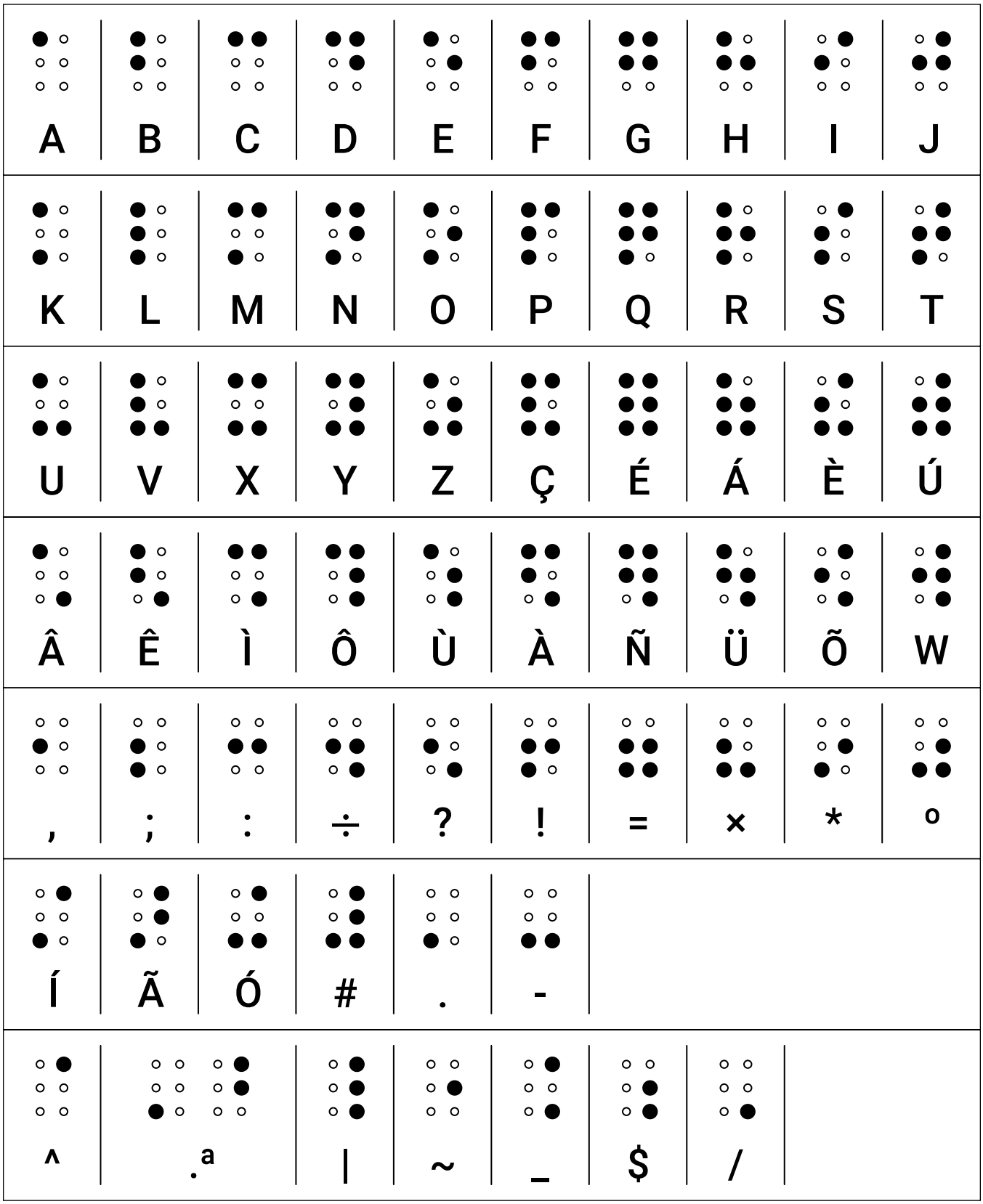


Figure 68. Fernandes, J. (2017). *Sistema Braille 1ª atualização 87 anos depois* [Annex]. In Blogue.

7.6. DECAPOINT & RAPHIGRAPHY

Braille wasn't the only writing system Louis Braille developed in his lifetime, **Decapoint** was another system that the french educator and inventor released in 1839[49]. The system consists of combining the method of dot-punching with a new specialised grill that he developed to assist in overlaying the shape of roman letters on paper. The objective was so that both sighted individuals and blind individuals could read and write by the same guiding structures.

[49]American Foundation for the Blind. (2009). *Braille Invents His Code.*

It was originally created for the relatives of his students that could not read or understand braille, but proved to be difficult for blind individuals themselves to use due to the height of ten dots, even assisted by a grid. A friend of Louis Braille, Pierre-François-Victor Foucault, learned of this style of writing and built his own contraption in 1841 to make the process much easier for his friend and students.

The **Raphigraph** was an apparatus designed for this style of writing, now renamed Raphigraphy, that could push all the points of one column of characters at the same time onto the paper. With the later invention of typewriters, Raphigraphy was quickly replaced by this new method of writing despite the impossibility of blind individuals to see what they had written, majorly because it proved to be much quicker and only needed the presence of someone to read what had been produced.[50]

[50]fakoo.de. (2024). *Raphigrafie 1839 als optisch lesbare Punktschrift von Louis Braille.*

Figure 69. fakoo.de. (n.d.). *Die Raphigrafie.* [Typography].

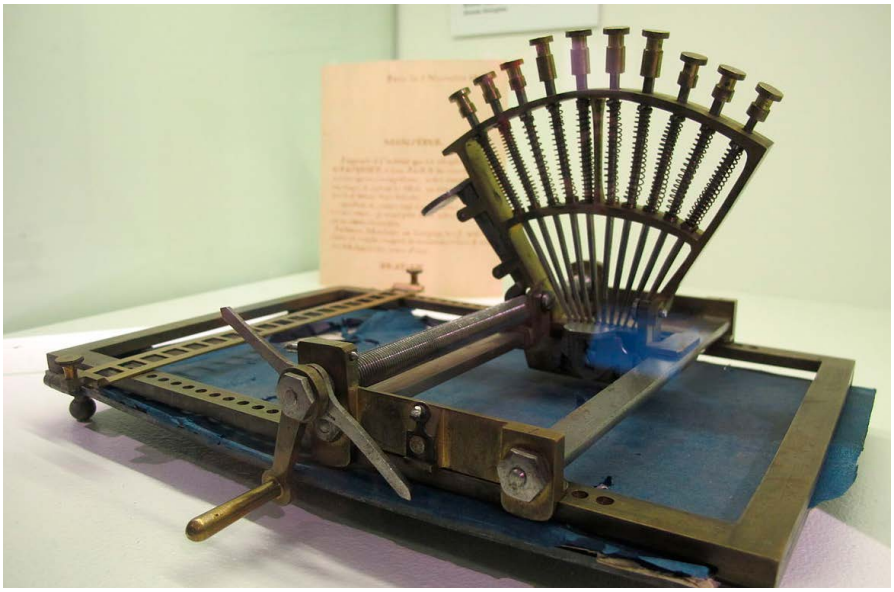


Figure 70. Musée Louis Braille. (n.d.). *Raphigraph by Pierre François Victor Foucault* [Photograph]. In His inventions.

7.7. TACTILE ALPHABETS & INDUSTRIAL PRINTING

Other intellectuals at the time like the American, William B. Wait (1839—1916), found the Braille system to be very bulky and tried to re-design letters that changed their length according to its usage, his “New York Point” (1868), being used in certain regions of North America for a short time. Others found it interesting to change certain aspects like capitalization and numerals, using Braille more freely to their own needs, adding certain variations according to language and country specifications.

European Route of Industrial Heritage. (n.d.). *The Industrial Revolution and Its Impact on European Society.* ERIH.

The New York Institute For Special Education. (n.d.). *History of Writing Codes for the Blind - New York Point.*

During the next century many small variations appear globally while Braille remains unchanged locally, still used according to its original rules. Other examples of this type of variant is the Korean Braille, created by Rosetta Sherwood Hall in 1894, using a cell 4 dots wide by 2 dots high - like the New York Point - but under a completely different set of rules. (Both currently discontinued in their respective countries).

Due to the continuous expansion of the Printing Press from the sixteenth to nineteenth centuries, 1500 to early 1900, we see big changes in Europe and in bookmaking as a whole. There are created and established many publishing houses in Europe that make mass production much easier and economic while there’s also improvements in press design, paper quality, and ink consistency. Events like the English Civil War or the American and French Revolutions make newspapers, pamphlets and bulletins much more available to the population and so experimentation becomes a lot more common.

From the Industrial Revolution (1760—1840) onwards, life became arduous but generally more affordable for everyone, including books and education that while still fairly limited to the wealthy and privileged, that possessed the money and time to indulge, became a lot more defused on the population. Steam power, and later electricity, made iron smelting and machinery much more available and many technological advancements appeared from this time forward.

7.8. TYPE MACHINES & TYPEWRITERS

Typewriters like many inventions, for example automobiles or telegraphs, are tools that were developed by many individuals and inventors over the centuries to ease the process of ordinary tasks, in this case writing. But despite this, these instruments possess two origin stories based primarily on trying to help a blind individual to read and write, much like the creation of the Raphigraph in 1841.

The legends are based in Italy in the beginning of the eighteenth century. The first tells the story of Pellegrino Turri that fell in love with the then Countess Carolina Fivizzono, and as the countess' eyes began to blur, distort, and/or fade he crafted a machine made with keys and metal arms tipped with raised characters so that when she pushed certain keys an arm struck a piece of carbon paper atop a sheet of paper. Another tells the legend of Agostino Fantoni, nephew of the Italian poet Labindo, that developed a similar machine to equally help his blind sister.[51]

[51]Story of computers, Hardware, software, internet... (2024). *History of Computers and Computing, Birth of the modern computer, The bases of digital computers, typewriter and computer keyboard.*

It was a pretty significant development for blind individuals for a variety of reasons: It provided blind individuals the ability to write fast and on par with their colleagues even if in some cases they needed help to understand and verify what had been typed afterwards, it was an easy process of just pressing a key instead of drawing the letters individually (the biggest hurdle until then even with Braille), made them equally wanted when it came to work as it became a predominant tool in most offices and workplaces, along other situational factors.

This only proved more reliable as later electric models and designs were released by the 1870s and these machines became the inspiration for later computer keyboards and key disposition. With technology advancements quickly changing and improving at this time, it became easier for visually impaired individuals to participate in normal everyday tasks with the help of specialised tools and with no extra assistance, a trend that still hasn't changed in the twenty-first century even if certain methods are considered old and antiquated due to the quick digitalization of media and the quick abandonment of past mechanical or manual tasks.

Figure 72. Underwood Typewriter Company. (1914). *Underwood Model 5 [Typewriter].* In National Museum of American History.

Figure 73. Smith Corona. (1960). *Smith Corona - SMC* [Electronic Typewriter]. In Atlas Showroom.

7.9. SPOKEN BOOKS AND AUDIOBOOKS

The only alternative for blind individuals to read any sort of book writing, that wasn't tactile or recited to them by others, appears in the 1930s with the development of **Spoken Books.** These consisted of audio recordings/readings in the form of vinyl records that could be heard up to 1 hour (30 minutes on each side) with the help of a gramophone. This later changed with the growth of the music industry, changing to cassette tapes by the 1960s and to compact disks by the 1980s, growing its production in both quantity, quality and duration.

The term "**Audiobook**" however only became the official term for these book readings by 1995. And with the advancements of the internet and computers, visually impaired individuals now have full access to these digital versions of books, free of charge, anywhere and at any time.

These do not replace book reading and writing by themselves but make it so it's easier for blind individuals to have versions of books available to them that would take too long to translate individually. Making them the most accessible medium for quick and easy research and/or entertainment.

National Library Service for the Blind and Print Disabled. (2021). *History, Talking-Book Machines*. NLS - Library of Congress.

Thoet, A. (2017, November 22). *A short history of the audiobook, 20 years after the first portable digital audio device*. PBS NewsHour.

7.10. MODERN BRAILLE TECHNOLOGY & TOOLS 5

Braille technology has come a long way from its creation in 1824. **Slates and styluses** are still the closest thing to a simple writing manual utensil, and are used frequently to this day, but now can be mass produced and bought at accessible prices, coming in a variety of shapes, sizes and materials.

Typewriters quickly developed and specialised to include the use of Braille. Starting in 1892 with the american inventor Frank Haven Hall[52], but the most relevant example being the **Perkins Brailler**, appearing in 1951, spreading and evolving to be its own separate machine. "Brailler" or "Perkins" became the terminology for machines that specialise in writing physical Braille in real time due to their availability and quality. Developing the "**Braille typewriter keyboard**", a system of fewer actions and more control for page positioning in a new key display, it is even possible to connect to a computer to replace the original integrated keyboard. (Opinions vary on its usefulness and usage but it still makes it possible to replicate roman word writing by writing it in braille).

[52]Van Rompuy, W. (2024). Hall braille typewriter. Typewriter. be. https://www.typewriter.be/hallbraille.htm

Figure 75. Perkins School for the Blind. (1951). *Perkins Brailler* [Typewriter].

Figure 76. Perkins School for the Blind. (n.d.). *Large Cell Perkins Brailler Keyboard* [Typewriter].

Typewriters can now include additional features that facilitate its usage for blind individuals such as word processing with audio feedback, more quiet keys compared to its original modules, lighter in weight and size for easier transportation as well as different styles of embossing and relief. Not to be confused with **Braille embossers**, that while also machines for embossing, are more comparable to impact printers.

Braille translation is often included in these embossers as it's a real time translation tool that reads digital or roman text and prints its equivalent in Braille to paper, this technology is also regularly used for voice translators and screen readers. The reverse of Braille translation, called **Optical braille recognition**, is a technology that translates Braille to roman text, being possible to read both one-sided or two-sided embossed paper.

Figure 77. 3D Hubs. (2016). *3D Printed Picture Books Help Blind Children Read* [3D Printing].

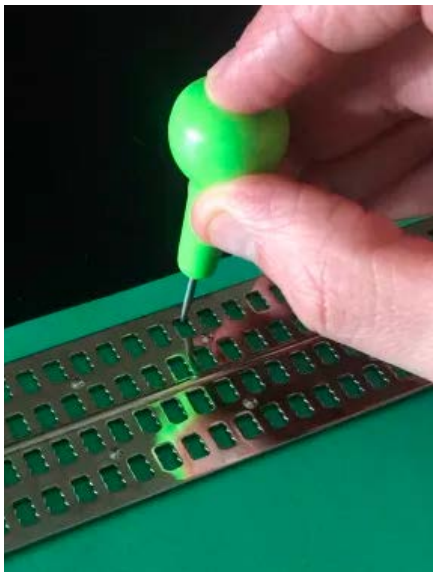


Figure 78. Blind Scholar. (n.d.). *Slate and Stylus* [Photograph].

Blind individuals can often differentiate between a Braille embosser from a non-Braille printer by simply calling it an "ink" printer as the system is completely different from its counterpart, being only able to emboss and prepare paper, "ink" is used as a term to include all techniques that are only visually readable.

With the rise of the internet and the spread of printing methods and software, self printing methods like **3D printing**, since the pandemic have become another reliable way to create tactile expression more specifically for embossed illustration and informational graphs, it's still in its early stage so it is yet to be more explored in different educational scenarios, but it's starting to be used domestically to positive effect.

Figure 79. Santarelli, R. (2019). Braille Embosser [Photograph].

Figure 80. XUEZHIYOU. (2023). Multilingual Scan Language Translation Pen [Photograph].

Brand new technology like **Smartpens** and **Smartpaper** offer a connection between the physical and the digital to meet which offers opportunities to blind individuals to adapt, but due to their current prices, it is still not reliable to a majority of the population and it's still exclusive to the audio facet of the products as the support for braille or embossing is still being tested and prototyped, the same being applied to similar technology.[53]

[53]Bliss, L. (2015, January 15). *Maps That You Can Hear and Touch*.

While not applicable to printing technology or book making in general, **Braille e-books** and **Refreshable braille displays** are systems that exist by recreating braille in real time with the help of electroactive polymers, heated wax or mechanical pins respectively. While exclusive to their own pad and computer systems for now, these are being developed to audiences that require or use braille fluently, and its usage might increase in the future or become more affordable if new audiences become more familiar with Braille in general.

The debate on its usage and importance is being debated alongside the ongoing conversation about physical books versus digital books. The important factor to take from this is the fact that even digital media can't entirely replace the tactical qualities of reading when it comes to Braille. And we might see big changes in the future when it comes to experimentation, in these examples, in embracing both physical and digital media.

Figure 81. Flament, D. (2018). Braille Notetaker [Photograph].

Figure 82. Bristol Braille Technology. (2023). Canute 360 [Photograph].

7.11. HISTORICAL RECORDS & PRESERVATION

Interests in the subject of preserving historical records for the blind only started by the end of the twentieth century (Late 1900), being only used sporadically until then as a tool of technical machinery refinement or selective practical aid, and not as a subject of academic research and technical innovation. Despite its usage throughout the last few centuries since the invention of the press, the subject is still quite recent in our recorded human history, at least in our general international and temporal timeframe.

To put this into perspective, while systems like Braille might've existed in their current form for a couple of centuries already, their records and selective mass proliferation might've only been dated to a handful of decades. Making this just the 4th or 5th generation with distinct knowledge about the subject in the current form we do today, heavily contrasting with other printing methods that might've existed and grown in popularity and availability since around 1440.

8. MARKETS & INFLUENCES (PORTUGAL) 4

"[Braille] Although it is considered the reading and writing system for people with visual impairments, some people with low vision can access information functionally using assistive devices (magnification software, magnifying glasses or enlarged printouts), meaning they do not need to use Braille. In addition to these, there are also cases of blind people who do not master the system.

Although it is simple, learning Braille by people with visual impairments can be conditioned by several factors such as psychomotor limitations, motivation, age at which the disability began, etc. On the other hand, the increasing use of new technologies such as computers and smartphones means that Braille is often not an option when it comes to accessing information."[54]

Says the ACAPO association when it comes to the Portuguese audience. Although still fairly used and encouraged, Braille is still a hurdle when it comes to availability in the Portuguese or European market. No major book retailers[55], at the time of publication of this thesis, have Braille books available in physical shops, and the few that do, only have available the audiobook version or are currently for its own educational purposes. If we observe the online ordering of each different retailer's website there's approximately a couple dozen works including braille, many being decade old results that are sold out or unavailable, the majority being not correctly categorised or for a very young audience included with other educational games.

[54] ACAPO. (2024). *Braille*. Associação Dos Cegos E Amblíopes de Portugal.

[55] The book retailers considered for this study being: **Bertrand, FNAC and Wook**. The period analysed and observed was from June to August of 2024 - **FNAC**, being objectively the best option in availability and for navigating by search engine, having the majority of its options being learning material for a younger audience.

Figure 83. Câmara Municipal do Porto. (2024). Feira do Livro do Porto 2024 [Photograph].

This is significant because it means that the most available and profitable means of book selling in the country is currently excluding its older and disabled population from owning reliable physical prints containing braille, even with the online market, where its inclusion while being limited would be more reliable than it's audience pirating or even self book printing their own books, which its in itself a time waster and would require very specific tools that not everyone has available. There's an unexplored market here for retailers, publishers and authors now that the digital market is becoming a more steady option for introducing new ideas while also measuring and gathering audiences and producing accordingly without taking as much of a risk or producing in excess.

While Braille as a system is absorbed much easier by a younger audience, it already has a limited but fairly accessible physical market, as stated before, in its educational and game inspired books that are entry level and form the practical skeleton of current Braille book sales. Adult audiences have been relying more on digital technology as a means of gathering and reading books: Audiobooks, Screen readers, and other assistive technologies have become more prevalent, potentially reducing the demand for physical Braille books but a fairly large portion of the population still might benefit from physical means of reading like the deaf community or the older less tech savvy generations that would benefit greatly from the sensory stimulation.

Figure 84. Comércio com História. (2019). Livraria Lello - Câmara Municipal do Porto [Photograph].

According to APEL*, an Association of Portuguese Publishers and Booksellers, by the months of July to August of 2023 in a survey of 1001 interviews, 99% and 88% of buyers showed preference for store bought, physical copies respectively. This proved to still be the preferential means to buy books in Portugal even after the Pandemic. We also have the age and buying habits of its audience: 15 to 34 year olds buy more in comparison to other ages (28% of every purchase) while from the ages 55 or upwards, individuals tend to buy just for themselves (87% of this age group), in other words for self consultation and not to gift away.

***APEL**, Associação Portuguesa de Editores e Livreiros, in Portuguese.

82% **Own Consumption**	53% **For Gifts**
99% **In Physical Format**	8% **In Digital Format**
88% **In Physical Stores**	39% **In Online Stores**

This can be a good opportunity to introduce means for captivating audiences, with something different and accessible for everyone, while also motivating them to partake in something they might've not found interesting otherwise (particularly in Braille) instead of limiting its access to those that would already need it. A timely, efficient and engaging way to practise its daily use and even an elderly friendly option as a means of keeping reading habits and consumption unchanged in our market.

8.1. LOCAL BLIND PRESS

While very limited in common traditional commercial companies, Braille books in Portugal are typically handled by specialised organisations themselves.

The **ACAPO** Association is the leading organisation dedicated to supporting the visually impaired community. They often collab with other publishers and produces their own small publications like calendars, pamphlets, notebooks and children books like for example "Topas e o Coelhinho Branco[56]" a children's book designed to be read and teach kids about Braille (possessing both braille sections, typography and illustrations). While they primarily distribute Braille books to their members and associated institutions, they also make some materials available for purchase or through public libraries.

***ACAPO**, Portuguese Association of the Blind and Partially Sighted, in english.

[56] ACAPO. (2016). *Livro "Topas e o Coelhinho Branco" - tinta e Braille.* Associação Dos Cegos E Amblíopes de Portugal.

These public libraries often are supported by the **Portuguese National Library (BNP)*** that has their own specialised service, "The Braille and Complementary Reading Aids Service*", known to produce Braille books, primarily for educational and cultural purposes. While the BNP does not typically sell Braille books directly, they distribute them through libraries and other public institutions. Another public institution that also supports the production of Braille books and other accessible formats is the **INR** or **National Institute for Rehabilitation**, they often work in unison with both **ACAPO** and the **BNP** for distributing these resources through public services rather than selling them commercially.

***Portuguese National Library,** Biblioteca Nacional de Portugal (BNP), in portuguese.

***The Braille and Complementary Reading Aids Service,** Serviço de Braille e Meios Complementares de Leitura, in portuguese.

***National Institute for Rehabilitation,** Instituto Nacional para a Reabilitação (INR), in portuguese.

Since 2022, the ACAPO Association has been discussing possible collaborations and/or exchanges with other international organisations. Some names that are being considered are primarily portuguese oriented like the brazilian "*Instituto Benjamin Constant*"[57]. According to the BNP: "The Braille book collection comprises around 2,900 titles / 9,000 volumes, including the first book printed in Portugal. The areas with the greatest presence are school textbooks and literature, where the dominant genre is the novel, although it also includes poetry and theatre. Children's and young people's literature is also represented."

[57] ACAPO. (2022, July). *ACAPO recebe Instituto Benjamin Constant - IBC.* Associação Dos Cegos E Amblíopes de Portugal.

"The Braille Music collection contains around 4,000 titles. It includes educational works and different genres of classical music by composers such as Mozart, Beethoven, Mendelssohn, etc. The works are for voice and instruments, with the piano predominating."

"There are around 50 periodicals – Portuguese and foreign – that make up this collection, 25 of which are ongoing, covering a variety of topics, including visual impairment. Of note are the publications - *Poliedro, Rosa dos Ventos* and *Ponto e Som*, Portuguese magazines in Braille that deserve to be highlighted both for their longevity and for the cultural and information services they provide to the visually impaired. The magazine Ponto e Som has been published by BNP, quarterly, in Braille and sound, since 1974."[58]

[58] Biblioteca Nacional de Portugal. (2024). *Recursos Braille*.

The catalogue is available for consultation online and registered readers are allowed to request specific copies of works to be delivered to their own local libraries, with a waiting period of undetermined time, delivered by the postal service without any extra cost. But even if extensive, their catalogue is limited to approved submissions and digital submissions which is by itself a very restricted and time extensive process.

When specialised organisations require bigger printing quantities and more distribution, they often seek assistance from local and/or national commercial companies and publishers that already deal with their own big volumes of material. **Leya** and **Porto Editora** are the biggest examples of distribution of Braille books through special orders or partnerships with organisations like ACAPO[59].

[59] Lusa, A. (2022, July 18). *Porto Editora disponibiliza 800 obras em braille na plataforma WOOK*. Observador.

While distribution is handled by these private companies, printing is handled by entities that already have the necessary machinery and competent specialists in the area of Braille and paper embossing. The *Centro Prof. Albuquerque e Castro* (CPAC)[60], in Porto, is a internal branch of the *Santa Casa da Misericórdia do Porto*[61], available since 1996, that specialises in these print runs of over 1000 copies, while also approving smaller prints and/or external digital documents via computer. While their Braille offerings are not always extensive, or of very long duration, these special orders often release many books at the same time, reviewed and analysed by their own professionals, and are often archived after some time in national libraries.

[60] Santa Casa da Misericórdia do Porto. (2024). *Centro Prof. Albuquerque e Castro - Imprensa Braille - Santa Casa da Misericórdia do Porto.*

[61] Santa Casa da Misericórdia do Porto. (n.d.). Website.

Apart from some seasonal publications and smaller prints, they also partner with big companies that might want to print and/or sell special Braille editions, or additional content, like it was the case in 2016 for the *VISÃO*[62], a weekly informational magazine, that printed a special edition *VISÃO braille*[63] with a goal of distributing them for free, monthly, to local institutions and national libraries.

[62] VISÃO. (2024, August 11). *Visão | Notícias da atualidade nacional e internacional*. Visão.

[63] VISÃO. (2019, August 5). *Há uma VISÃO em braille para integrar e informar.* Visão.

Figure 85. Monteiro, L. (2016). *"Como se faz a VISÃO braille - Revisão"* [Photograph].

Figure 86. Monteiro, L. (2016). Como se faz a VISÃO braille - Impressão [Photograph].

They've also made a clear statement on wanting to divulge the centre's projects since its inception back in 1956, be it by book presentation and fairs or school collaborations and presence[64], pre-dating even the approval of the current Braille system in Portugal, back in 2017, for its clear importance for these communities.

[64] Santa Casa da Misericórdia do Porto. (2017). *Livro infantil com leitura em Braille apresentado na Feira do Livro - Notícias - Santa Casa da Misericórdia do Porto.*

8.2. THE FUTURE OF BRAILLE

The inclusion of Braille and Braille books in the county has been having a very slow growth, if not a bit of stagnation ever since 2019, when **4 of January** became the **International Braille Day**. Around this year we saw much more initiative in including braille in public discussions like, for example, in the European Elections of that same year with the introduction of the first ever braille vote in ballot papers.

A growth that has declined, according to Marta Pinheiro, secretary of the national board of ACAPO in 2019, doesn't believe that these forms of media could ever become quite obsolete, on the contrary, she says that "its always changing", " (...) [we are] the most recent proof of the adaptability of this system"[65].

[65] Município de Guimarães. (2019). *A "sobrevivência" do Braille na era digital – Forum Municipal das Pessoas com Deficiência.*

According to **The European Blind Union (EBU)** in 2023, Braille usage in books has been declining rapidly and there's been insufficient acquisition of Braille reading skills for its normal sustainability[66]. It's more important than ever to focus on education and public awareness for its preservation and usage due to all it does for the people that require its daily usage, as well as the ones that would need it in the future, save the context, technical and mechanical innovations that pass as invisible for many today.

[66] EBU - The European Blind Union. (2023). *Access to Reading and Using Braille -a matter of the future EBU Statement.*

Even if no survey currently exists for its usage in Portugal: a clear lack of Braille is visible in some of the biggest forms of bookselling in the county, it's normal transcription is in its most

Figure 87. Li, E. (2021). Photo of Magnifying Glass on Top of Braille [Photograph].

Figure 88. Miroshnichenko, T. (2021). Close-up Photo of Braille Book [Photograph].

basic form a very slow and meticulous process to ensure its quality, the visible lack of employed specialists in stable positions, it's public perception and availability being adequate but not on the same level one would be comfortable with if it was any other type of physical media, the recent and frequent creation of workshops, online courses and classes to ensure its survival and usage. Among other factors, unreferred in this study, more local and cultural aspects of society as a whole.

Braille is the "**Direct experience with literacy**", allowing blind or deafblind people to actually read and write text on an equal footing with sighted people. All the other auditive forms of the perception are **passive** access to the information, whether it is an audiobook, synthetic voice of a computer or a smartphone or voice of a person reading the information for us. (Englebretson, Blind Anthropologist and Psycholinguistic, 2022.)[67]

[67] Englebretson, R., Holbrook, M. C., & Fischer-Baum, S. (2023). *A position paper on researching braille in the cognitive sciences: decentering the sighted norm.* Applied Psycholinguistics, 44(3), 400–415. 10.1017/S0142716423000061. 1–16.

And as such it's a duty of every person that believes in the importance of Education and the Art of Book Printing and Preservation that, even in a limited form, it receives its due acknowledgement, keeps its perpetuity, and is encouraged for its purest intrinsic value.

"We transcribe books according to the need and the requests we receive. In recent years, we have been focusing on dual-reading materials. I think that is where we should go (...)". João Belchior (2017), director of CPAC[68].

*__CPAC,__ *Centro Prof. Albuquerque e Castro*, Porto.

[68] RTP Arquivos. (2017). *Livros em braille.*

Dual-reading, allying common printing methods with Braille, might be the best and most promising way to resolve the issue with the already existing methods available today. But other methods can still be explored by further research and studies, if people are made aware of its position today.

8.3. AVAILABILITY & PUBLIC 2

Many public spaces like national schools and libraries nowadays have specified portions of their spaces dedicated to braille books in their own organised sections, and/or audio libraries available online, for readers that might require these services. While the majority of reading places are independent from each other, having just a few physical volumes shared among themselves, some can be ordered if requested from the national archive if available.

At first glance having a national designated section for these spaces destined to a specific type of books sounds exclusive as it could be archived by subject like the rest of the system, but due to the normal quantity of braille works in a single place, or in this case its scarcity, some could get lost or not archived properly (as they require certain upkeep conditions) not to mention the extra constraints on the reader to find them in the first place.

Currently it is logistically responsible to not change anything about the internal organisation of the current national system as it might prove itself alienating to visually impaired individuals that might already be used to its inner workings. But it seems there's a missing opportunity for something else that could be taken advantage of, for both visually impaired individuals and the public at large, while also increasing visibility for these types of books in general.

Figure 89. GO Porto, E.M. (24 C.E.). *Biblioteca Pública Municipal do Porto* [Photograph].

The issue by omission of this system doesn't come from its current national organisation, but from the lack of shared public knowledge when it comes to the process in the first place.

Every municipal library has its own collection, requests are free but can take variable times to provide finished copies, information is available but only if asked directly at the desk or finding it in time or with another person's help. Online library portals are often old or hidden behind layers and layers of unhelpful loopholes that its intended audience would have trouble reaching in the first place and discourage still learning readers to seek out.[69]

[69] Portal do Munícipe do Porto. (2024). *Livros em braille*. Portal Do Munícipe.

Figure 90. Biblioteca Nacional de Portugal. (2024). *Leitura para deficientes visuais* [Screenshot].

Not many independent individuals request big braille volumes or in larger quantities in the first place, and depending on their complexity, some can take many weeks, months or even years to plan a new production. Not every printing house has an embosser for braille, not every reader of braille can verify it efficiently after being translated (like any english reader or even A.I. intelligence wouldn't normally be asked to verify an english scientific paper for example) so generally it's difficult to obtain new books frequently and not every library has all books available at all times depending on its population density, but individuals are stuck to these methods because they're the most effective with what's available.

Adding other external social factors like the ageing population, the small number of specialists that know how to utilise these machines or how to proof-read braille efficiently, the very specific demand for books of this nature, among others — It should be important to keep this already present system but maybe expand it to include more specific programs for readers to find them in the first place, visibility seems to be the issue as it's often obscured or a second thought in both digital portals and physical spaces. But perhaps engaging more with these systems might make them more available in the future.

The children's book market seems to be the most successful as it often makes something more than simple teaching braille as it offers textures, games, sounds or is, interestingly enough, visually appealing to other kids. Perhaps a way to incentivise more usage and provide more availability for these specialised books might be to enter certain niches that could be beneficial in other ways, like what was trying to be proven by this thesis prototype.

Figure 91. Mockups Design. (2020, October). *Binded Book Mockup.*

9. CONCLUSION & FUTURE PROSPECTS

”Invisible Books” offers a glance at a possible future of editorial design for the blind and visually impaired, while also not avoiding the honest critique about the current state of the physical media in these vulnerable circles. By addressing the current problems while also collecting and using what’s available, this project reflects on a future where multisensory books are not only a niche product but a standard practice that enhances the reading experience for everyone regardless of physical limitations.

And this by itself can help produce a multitude of other studies: It’s possible integration with other new technologies, new ways to incorporate educational themes into this type of specialised environments, how to maintain more low cost productions of similar future experiences, figure how to make the ageing population more aware of these experiences to garner more interest, or just what better materials and approaches one would take for many other different contexts.

The journey towards a more open and communicative future involves continuous experimentation, collaboration, and innovation from designers, authors and publishers alike to ensure that the design of sensory experiments, such as this one, keep pace with the times along with the ever changing needs of readers and their enjoyment of physical mediums.

So they never quite fade,
But just become a little more interesting.

BIBLIOGRAPHY

ACAPO. (2024a). *Braille*. Associação Dos Cegos E Amblíopes de Portugal. (Retrieved June 8, 2024) https://www.acapo.pt/deficiencia-visual/perguntas-e-respostas/braille

ACAPO. (2024b). *Produtos de Apoio*. Associação Dos Cegos E Amblíopes de Portugal. (Retrieved June 17, 2024) https://www.acapo.pt/deficiencia-visual/perguntas-e-respostas/produtos-de-apoio

ACAPO. (2022, July). *ACAPO recebe Instituto Benjamin Constant - IBC*. Associação Dos Cegos E Amblíopes de Portugal. (Retrieved June 20, 2024) https://www.acapo.pt/noticias/acapo-recebe-instituto-benjamin-constant-ibc

ACAPO. (2016). *Livro "Topas e o Coelhinho Branco" - tinta e Braille*. Associação Dos Cegos E Amblíopes de Portugal. (Retrieved June 18, 2024) https://www.acapo.pt/livro-topas-e-o-coelhinho-branco-tinta-e-braille

Almog, Y., & Nemet, A. (2010). *The Correlation Between Visual Acuity and Color Vision as an Indicator of the Cause of Visual Loss*. American Journal of Ophthalmology, 149(6), 1000–1004. (Retrieved June 16, 2024) https://doi.org/10.1016/j.ajo.2010.01.011

American Foundation for the Blind. (2014). *Braille Invents His Code.* Archive.org; The Wayback Machine. (Retrieved July 21, 2024) https://web.archive.org/web/20170803001017/ http://www.afb.org/louisbraillemuseum/braillemediaviewer.asp?FrameID=186#main

APH American Printing House for the Blind. (2024, April 24). *Blindness History Basics: History of Braille Writers | American Printing House*. American Printing House; APH. (Retrieved June 9, 2024) https://www.aph.org/blindness-history-basics-history-of-braille-writers/

APH American Printing House for the Blind. (2021, May 11). *First Raised Letters: Early Efforts in Embossed Line Type*. Youtube. (Retrieved June 10, 2024) https://www.youtube.com/watch?v=yMx4p97XnjA

Arcos, K., Harhen, N., Loiotile, R., & Bedny, M. (2022). *Superior verbal but not nonverbal memory in congenital blindness*. Experimental Brain Research, 240. (Retrieved June 18, 2024) https://doi.org/10.1007/s00221-021-06304-4

Arditi, A., Holtzman, J. D., & Kosslyn, S. M. (1988). *Mental imagery and sensory experience in congenital blindness*. Neuropsychologia, 26(1), 1–12. (Retrieved June 19, 2024) https://doi.org/10.1016/0028-3932(88)90026-7

Associação Salvador. (2023). *Pessoas com Deficiência em Portugal Indicadores de Direitos Humanos 2023*. Instituto Superior de Ciências Sociais e Políticas - ULisboa. (Retrieved June 8, 2024) https://associacaosalvador.com/wp-content/uploads/2024/02/Relatorio-ODDH-2023.pdf

Australian Braille Authority. (2020, October 18). *Physical Specifications for Braille | Australian Braille Authority*. Australian Braille Authority. (Retrieved June 7, 2024) https://brailleaustralia.org/about-braille/physical-specifications-for-braille/

Bendt, F., & Skropska, M. (2008). *The Relationship between Foreign Market Expansion Strategies and Foreign Market Entry Strategies for SMEs*. (Retrieved June 10, 2024) https://www.diva-portal.org/smash/get/diva2:1031988/FULLTEXT01.pdf

BIAL Foundation. (2021). *Does blindness affect the way we perceive whether an emotion is authentic or posed?* Bialfoundation.com. (Retrieved June 11, 2024) https://www.bialfoundation.com/com/science-stories/posts/does-blindness-affect-the-way-we-perceive-whether-an-emotion-is-authentic-or-posed/

Biblioteca Nacional de Portugal. (2024). *Recursos Braille.* Bnportugal.gov.pt. (Retrieved June 7, 2024) https://www.bnportugal.gov.pt/index.php?option=com_content&view=article&id=125&Itemid=153&lang=pt

Bliss, L. (2015, January 15). *Maps That You Can Hear and Touch*. Bloomberg.com. (Retrieved June 17, 2024) https://www.bloomberg.com/news/articles/2015-01-15/maps-that-you-can-hear-and-touch

Braille Works. (2013). *History of Braille - Braille Works.* Brailleworks.com. (Retrieved June 13, 2024) https://brailleworks.com/braille-resources/history-of-braille/

Burgstahler, S. (2021). *Universal Design: Process, Principles, and Applications*. Washington.edu. (Retrieved June 15, 2024) https://www.washington.edu/doit/universal-design-process-principles-and-applications

Caltrider, D., Gupta, A., & Tripathy, K. (2021). *Evaluation Of Visual Acuity.* PubMed; StatPearls Publishing. (Retrieved June 16, 2024) https://www.ncbi.nlm.nih.gov/books/NBK564307/

Câmara de Lisboa. (2015). *Jornal dos cegos: revista de educação e ensino intellectual e profissional dos cegos* [1895-1903]. Cm-Lisboa.pt. (Retrieved June 20, 2024) https://hemerotecadigital.cm-lisboa.pt/periodicos/jornaldoscegos/jornaldoscegos.htm

Campsie, P. (2021). *Charles Barbier: A hidden story.* Disability Studies Quarterly, 41(2). (Retrieved June 27, 2024) https://doi.org/10.18061/dsq.v41i2.7499

Castilho, A. F. (1975). *Correspondência pedagógica de António Feliciano de Castilho*. Biblioteca da Universidade de Trás-os-Montes e Alto Douro (UTAD). Annotations by Dr. Fernando Castelo Branco, in collaboration with the Gulbekian foundation. (Retrieved June 11, 2024) https://catalogo.biblioteca.utad.pt/cgi-bin/koha/opac-detail.pl?biblionumber=32021.

Castilho, A. F. (1853). *Metodo Castilho para o ensino rapido e aprasivel do ler impresso, manuscrito, e numeração e do escrever, Lisboa, 1853 - Biblioteca Nacional Digital*. Purl.pt. (Retrieved June 17, 2024) https://purl.pt/185/4/sc-28857-p_PDF/sc-28857-p_PDF_24-C-R0150/sc-28857-p_0000_capa-capa_t24-C-R0150.pdf

CDC. (2011, April). *Blindness and Vision Impairment - Centers for Disease Control and Prevention*. The Wayback Machine. (Retrieved April 29, 2015) https://web.archive.org/web/20150429145832/http://www.cdc.gov/healthcommunication/toolstemplates/entertainmented/tips/blindness.html

Centre for Excellence in Universal Design. (2024). *About Universal Design*. Universaldesign.ie. (Retrieved June 13, 2024) https://universaldesign.ie/about-universal-design

Cesar Augusto Castro, Boto, C., & Luís, S. (2024). *ANTÓNIO FELICIANO DE CASTILHO: Cadernos de Pesquisa*, 30(4), 31–55. (Retrieved June 7, 2024) https://doi.org/10.18764/2178-2229v30n4.2023.57

CUF. (n.d.). *Saúde A-Z: Doenças, Sintomas e Tratamentos - Cegueira*. www.cuf.pt. (Retrieved June 5, 2024) https://www.cuf.pt/saude-a-z/cegueira

EBU - The European Blind Union. (2023). *Access to Reading and Using Braille — a matter of the future EBU Statement*. (Retrieved June 7, 2024) https://www.euroblind.org/sites/default/files/documents/EBU%20Position%20paper%20on%20Braille%202023.pdf

Edwards, P. (2022, April). *Blindness Culture: Reimagining Who We Are*. www.acb.org; American Council of the Blind. (Retrieved July 3, 2024) https://www.acb.org/blindness-culture-reimagining-who-we-are

Englebretson, R., Holbrook, M. C., & Fischer-Baum, S. (2023). *A position paper on researching braille in the cognitive sciences: decentering the sighted norm*. Applied Psycholinguistics, Applied Psycholinguistics, 44(3), 400–415 (doi:10.1017/S0142716423000061), 1–16. (Retrieved June 5, 2024) https://doi.org/10.1017/s0142716423000061

Equestri, A. (2022, March 23). *Literature and Disability in the English Renaissance.* Oxford Research Encyclopedia of Literature. (Retrieved June 25, 2024) https://oxfordre.com/literature/display/10.1093/acrefore/9780190201098.001.0001/acrefore-9780190201098-e-1317

Erzilbengoa, E. (2023, January 8). L'histoire du dimanche - Avant l'invention du braille, Valentin Haüy fondait en 1785 la première école pour aveugles à Paris. France 3 Hauts-De-France. (Retrieved June 13, 2024) https://france3-regions.francetvinfo.fr/hauts-de-france/oise/l-histoire-du-dimanche-avant-l-invention-du-braille-valentin-hauy-fondait-en-1785-la-premiere-ecole-pour-aveugles-a-paris-2685116.html

European Route of Industrial Heritage. (n.d.). The Industrial Revolution and Its Impact on European Society. Loyola University Chicago; ERIH. (Retrieved June 20, 2024) https://webpages.cs.luc.edu/~dennis/106/106-Bkgr/20-Industrial-Rev.pdf

Eurostat. (2023, March). Population projections in the EU - Statistics Explained. Ec.europa.eu. (Retrieved June 6, 2024) https://ec.europa.eu/eurostat/statistics-explained/index.php?title=People_in_the_EU_-_population_projections&oldid=497115

Evidence Map. (2019). Disability Employment - Evidence Map. Disabilityemployment. evidencemap.com. (Retrieved June 7, 2024) https://disabilityemployment.evidencemap.com/

Fakoó, A. (2014). *Dotty-Moon шрифт*. Online Fonts. (Retrieved June 18, 2024) https://online-fonts.com/fonts/dotty-moon

fakoo.de. (2024). *Raphigrafie 1839 als optisch lesbare Punktschrift von Louis Braille*. Fakoo.de. (Retrieved June 18, 2024) https://fakoo.de/raphigrafie.html

FBTB. (2022). *FBTB22: Jared Spool – What Got UX Here Won't Get UX There*. (Retrieved June 7, 2024) https://youtu.be/P_ES54EBaCw?si=VBQNM1nyBYls88QS

Fernandes, J. (2017, October 13). *Sistema Braille, 1ª atualização 87 anos depois*. Acessibilidade.gov.pt. (Retrieved June 9, 2024) https://www.acessibilidade.gov.pt/blogue/categoria-noticias/sistema-braille-oficializado/

Ferreira, C., & Graça, A. (2015). *A Área de Leitura para Deficientes Visuais da Biblioteca Nacional de Portugal: um estudo de caso*. (Retrieved June 13, 2024) https://publicacoes.bad.pt/revistas/index.php/congressosbad/article/view/1317/pdf_66

Fontes, F., & Martins, B. S. (2023). *A deficiência em Portugal: Lugares, corpos e lutas* [Project] (Retrieved June 19, 2024). https://hdl.handle.net/10316/111084

Fredrickson, B. L. (2001). *The Role of Positive Emotions in Positive Psychology*. The American Psychologist, 56(3), 218–226. The Broaden-and-Build Theory of Positive Emotions. (Retrieved June 9, 2024) https://doi.org/10.1037//0003-066x.56.3.218

GlasgowLife. (2019). *Alston - Glasgow Libraries Online Library*. Csglasgow.org. (Retrieved July 10, 2024) https://libcat.csglasgow.org/web/arena/alston

Hodge, Dr. Suzanne., & Eccles, Dr. Fiona. (2014). *Loneliness, social isolation and sight loss Research Findings*. (Retrieved June 16, 2024) https://www.pocklington.org.uk/wp-content/uploads/2020/10/Loneliness-social-isolation.pdf

Hugo, V. (1831). *The Hunchback of Notre Dame: Vol. Book 1* (Chapter 5). Gosselin.

Hyvärinen, L. (2007). *Implications of Deafblindness on Visual Assessment Procedures: Considerations for Audiologists, Ophthalmologists, and Interpreters*. Trends in Amplification, 11(4), 227–232. (Retrieved July 9, 2024) https://doi.org/10.1177/1084713807308364

IAPB. (2020a). *The International Agency for the Prevention of Blindness*. Causes of Vision Loss. www.iapb.org. (Retrieved June 5, 2024) https://www.iapb.org/learn/vision-atlas/causes-of-vision-loss/

IAPB. (2020b). *The International Agency for the Prevention of Blindness*. Projected Change in Vision Loss 2020 to 2050. www.iapb.org. (Retrieved June 6, 2024) https://www.iapb.org/learn/vision-atlas/magnitude-and-projections/projected-change/

Illingworth, W. H. (1910). *History of the Education of the Blind*. Hardpress Publishing. (Retrieved June 9, 2024) https://www.duxburysystems.org/downloads/library/history/history_ed_blind_1910.pdf

Instituto Nacional de Estatística. (2022). *Estatísticas demográficas: 2022*. www.ine.pt; Instituto Nacional de Estatística. (Retrieved June 4, 2024) https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_publicacoes&PUBLICACOESpub_boui=637357865&PUBLICACOESmodo=2

Instituto Nacional para a Reabilitação I.P. (2021). *Compilação das comunicações apresentadas no seminário comemorativo do Dia Mundial do Braille de 2020*. Núcleo Para O Braille E Meios Complementares de Leitura, 978-989-8051-21-9. (Retrieved June 10, 2024) https://www.inr.pt/documents/11309/48776/Publica%C3%A7%C3%B5es+Semin%C3%A1rio+Braille+2020/c7a598e4-de93-4fef-ad3b-5b3862b53973

International Encyclopedia of the First World War. (2014, October 8). *War Losses* (Germany). *1914-1918-Online* (WW1) *Encyclopedia*. (Retrieved June 17, 2024) https://encyclopedia.1914-1918-online.net/article/war-losses-germany/

ISCSP-ULisboa . (2023). *Pessoas com Deficiência em Portugal*. Universidade de Lisboa. (Retrieved June 12, 2024) https://pessoas2030.gov.pt/wp-content/uploads/sites/19/2023/12/RELATORIO_ODDH2023-14dez.pdf

Journal of Blindness Innovation and Research. (2018). *The Association between Braille Reading History and Well-being for Blind Adults*. Nfb.org; JBIR. (Retrieved June 11, 2024) https://nfb.org/images/nfb/publications/jbir/jbir18/jbir080103.html

Kelly, L. (2015). *Knowledge and power in oral cultures*. Cambridge University Press; Cambridge University Press. (Retrieved June 12, 2024) https://www.cambridge.org/core/books/knowledge-and-power-in-prehistoric-societies/knowledge-and-power-in-oral-cultures/81F77DEA1DD6E7B6F759EF685110B6B4

Kenny, A. (2018, August 20). *Research*. Fighting Blindness. (Retrieved June 9, 2024) https://www.fightingblindness.ie/how-we-can-help/research/

Letterform Archive. (2022, August 17). *The Tactile Book: Embossing Systems for Blind Readers*. YouTube. (Retrieved June 5, 2024) https://www.youtube.com/watch?v=D2vavAAaw1k&list=PL-zoc4IxuNbZF3P2f6-P2MjDhuWkk0zpk&index=4

Loh, L., Mallika Prem Senthil, & Constable, P. A. (2024). *A systematic review of the impact of childhood vision impairment on reading and literacy in education*. Journal of Optometry, 17(2), 100495–100495. (Retrieved June 15, 2024) https://doi.org/10.1016/j.optom.2023.100495

Lucas, J., & 2022. (2022, April 27). *Blind people remember language better than sighted people do.* The Hub; Johns Hopkins University. (Retrieved June 17, 2024) https://hub.jhu.edu/2022/04/27/blind-people-recall-language-better-than-sighted-people/

Lusa, A. (2022, July 18). *Porto Editora disponibiliza 800 obras em braille na plataforma WOOK*. Observador. (Retrieved June 20, 2024) https://observador.pt/2022/07/18/porto-editora-disponibiliza-800-obras-em-braille-na-plataforma-wook/

Maia, W. (2020, June 6). *Recursos de Acessibilidade dos smartphones para deficientes visuais*. www.youtube.com. (Retrieved June 4, 2024) https://www.youtube.com/watch?v=8oJuD-HAcrI

Maria João Lopes. (2016). Ana Sofia Antunes é a primeira secretária de Estado cega. PÚBLICO; Público. (Retrieved June 23, 2024) https://www.publico.pt/2015/11/25/politica/noticia/ana-sofia-antunes-e-a-primeira-secretaria-de-estado-cega-1715584

MegaPontes. (n.d.). MegaPontes - Tecnologia Acessível para Cegos / Baixa Visão. Megapontes.pt. (Retrieved July 9, 2024) https://megapontes.pt/

Mendes, I. (2024). Visão (Poema), de Antônio Feliciano de Castilho. Youtube; Poético. (Retrieved June 5, 2024) https://youtu.be/Vtv3so5BzMU?si=yAGT-CO8XCP_skF0

Mills, P. V. (1965). Thomas Lucas and his embossed stenographic characters. British Journal of Ophthalmology, 49(9), 485–489. (Retrieved June 8, 2024) https://doi.org/10.1136/bjo.49.9.485

Misericórdia do Porto. (2024). *Inauguração das novas instalações do Centro Prof. Albuquerque e Castro* (CPAC) – Imprensa Braille. Youtube. (Retrieved June 4, 2024) https://youtu.be/0vNvri1XEzQ?si=kKoY17s3VVIyz9Lw

Município de Guimarães. (2019). *A "sobrevivência" do Braille na era digital – Forum Municipal das Pessoas com Deficiência*. Guimaraes.pt. (Retrieved June 17, 2024) https://forumdeficiencia.guimaraes.pt/?p=408

National Centre on Disability and Journalism. (2018). *Disability Language Style Guide | National Center on Disability and Journalism*. Ncdj.org; National Center on Disability and Journalism. (Retrieved June 5, 2024) https://ncdj.org/style-guide/

National Federation of the Blind. (1974, July 3). *Blindness: Is Literature Against Us?* Nfb.org. (Retrieved June 12, 2024) https://nfb.org/images/nfb/publications/convent/banque74.htm

National Institute for the Blind. (2016). *A History of Blind Welfare in England and Wales*. Internet Archive. (Retrieved June 10, 2024) https://archive.org/details/historyofblindwe00unse/

National Library Service for the Blind and Print Disabled. (2021). *History, Talking-Book Machines*. NLS - Library of Congress. (Retrieved June 23, 2024) https://www.loc.gov/nls/who-we-are/history/

Nicolau, H., Guerreiro, T., & Jorge, J. (2009). *Designing Guides for Blind People*. (Retrieved June 8, 2024) https://www.di.fc.ul.pt/~tjvg/amc/blobby/files/paper-nicolau.pdf

Instituto Nacional para a Reabilitação I.P. (2021). *Compilação das comunicações apresentadas no seminário comemorativo do Dia Mundial do Braille de 2020.* Núcleo Para O Braille E Meios Complementares de Leitura, 978-989-8051-21-9. (Retrieved June 13, 2024) https://www.inr.pt/documents/11309/48776/Publica%C3%A7%C3%B5es+Semin%C3%A1rio+Braille+2020/c7a598e4-de93-4fef-ad3b-5b3862b53973

NYISE. (n.d.). *Gall, Alston, Lucas & Moon*. nyise.org; The New York Institute for Special Education. (Retrieved June 19, 2024) https://www.nyise.org/apps/pages/index.jsp?uREC_ID=438103&type=d&pREC_ID=948713

Ofcom. (2023). *Childrens Media Use and Attitudes Report 2023*. Ofcom's Children's and Parents' Media Literacy Tracker. (Retrieved June 6, 2024) https://www.ofcom.org.uk/siteassets/resources/documents/research-and-data/media-literacy-research/children/childrens-media-use-and-attitudes-2023/childrens-media-use-and-attitudes-report-2023.pdf?v=329412

Optical Images. (2021, December 21). *What's the Difference Between Low Vision and Blindness? Optical Images*. (Retrieved June 5, 2024) https://www.opticalimages.com/whats-the-difference-between-low-vision-and-being-legally-blind/

Perkins School for the Blind. (n.d.). *Eight tips to introduce reading to your young child who is blind*. Perkins School for the Blind. (Retrieved June 16, 2024) https://www.perkins.org/resource/eight-tips-to-introduce-reading-to-your-young-child-who-is-blind/

Perkins School for the Blind. (2019). *Perkins School for the Blind. Perkins School for the Blind.* (Retrieved June 16, 2024) https://www.perkins.org/

Peters, P. (2014). *The Cambridge Dictionary of English Grammar*. Stuttgart Klett.

Portal do Munícipe do Porto. (2024). *Livros em braille*. Portal Do Munícipe. (Retrieved June 16, 2024) https://portaldomunicipe.cm-porto.pt/pt/-/livros-em-braille-1

Portugal. Government - Portuguese Republic. (2022). *Ana Sofia Antunes - Secretary of State for Inclusion*. Portugal.gov.pt. (Retrieved June 16, 2024) https://www.portugal.gov.pt/en/gc23/ministries/labour-solidarity-and-social-security/secretaries-of-state?date=2022-03-30&i=inclusion

Radziun, D., Crucianelli, L., Korczyk, M., Szwed, M., & Ehrsson, H. H. (2023). *The perception of affective and discriminative touch in blind individuals*. Behavioural Brain Research, 444, 114361. (Retrieved June 17, 2024) https://doi.org/10.1016/j.bbr.2023.114361

República Portuguesa, & Segurança Social. (2019). *Guia Prático: Os Direitos das Pessoas com Deficiência em Portugal*. (Retrieved June 6, 2024) https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=%3d%3dBAAAAB%2bLCAAAAAAABACzMDW0AAAFlyTYBAAAAA%3d%3d

Research to Prevent Blindness—RPB. (2014). *Short History of RPB*. rpbusa.org. (Retrieved June 13, 2024) https://www.rpbusa.org/rpb/about/us/mission-and-history/short-history-of-RPB/

RNIB. (2022, June). *Starting Out Series – Emotional Support*. RNIB. (Retrieved June 9, 2024) https://media.rnib.org.uk/documents/Starting_out_-_Emotional_Support_2022.pdf

Royal Blind. (2019, April 8). *Who was Louis Braille? | National Braille Week*. Web.archive.org; The Wayback Machine. (Retrieved June 10, 2024) https://web.archive.org/web/20190408160409/https://www.royalblind.org/national-braille-week/about-braille/who-was-louis-braille

RTP Arquivos. (1975, August 2). *Castilho Morreu Há Cem Anos – Parte I & II*. RTP Arquivos. https://arquivos.rtp.pt/conteudos/castilho-morreu-ha-cem-anos-parte-i/

RTP Arquivos. (2017). *Livros em braille.* Arquivos.rtp.pt. (Retrieved June 13, 2024) https://arquivos.rtp.pt/conteudos/livros-em-braille-2/

Santa Casa da Misericórdia do Porto. (n.d.). *Website.* scmp.pt. (Retrieved June 6, 2024) https://www.scmp.pt/pt-pt/

Santa Casa da Misericórdia do Porto. (2017). *Livro infantil com leitura em Braille apresentado na Feira do Livro - Notícias - Santa Casa da Misericórdia do Porto*. Scmp.pt. (Retrieved July 13, 2024) https://www.scmp.pt/pt-pt/noticias/livro-infantil-com-leitura-em-braille-apresentado-hoje-na-feira-do-livro

Santa Casa da Misericórdia do Porto. (2024). *Centro Prof. Albuquerque e Castro - Imprensa Braille - Santa Casa da Misericórdia do Porto*. Scmp.pt. (Retrieved June 6, 2024) https://www.scmp.pt/pt-pt/imprensa-braille/cpac

Santa Casa Misericórdia Porto. (2010). *Ler é Crescer: Leio Sozinho Nível 1.* Santa Casa Misericórdia Porto. (Bought at July 13, 2024)

Sarzedas, J., Lima, C. F., Roberto, M. S., Scott, S. K., Pinheiro, A. P., & Conde, T. (2023). *Blindness Influences Emotional Authenticity Perception in Voices: Behavioral and ERP Evidence.* Cortex, 172. (Retrieved June 23, 2024) https://doi.org/10.1016/j.cortex.2023.11.005

Seal, J. (2022, October 26). *Revelations of blindness in the Middle Ages.* Wellcome Collection. (Retrieved June 15, 2024) https://wellcomecollection.org/articles/Y1AMkxEAAImMCDR4

Sertec. (n.d.). *Informação e orientação para pessoas com deficiência Visual.* Sertec.pt. (Retrieved June 8, 2024) https://www.sertec.pt/index.php

Sharma, N., Yadav, V. P., & Sharma, A. (2021). *Attitudes and empathy of youth towards physically disabled persons. U.S. Department of Health and Human Services* (HHS). (Retrieved June 9, 2024) https://pubmed.ncbi.nlm.nih.gov/34466710/

Sousa, A. A., Todorov, O. S., & Proulx, M. J. (2022). *A natural history of vision loss: Insight from evolution for human visual function.* Neuroscience & Biobehavioral Reviews, 134(104550). (Retrieved July 5, 2024) https://doi.org/10.1016/j.neubiorev.2022.104550

Story of computers, Hardware, software, internet... (2024). *History of Computers and Computing, Birth of the modern computer, The bases of digital computers, typewriter and computer keyboard.* Archive.org; The Wayback Machine. (Retrieved July 13, 2024) https://web.archive.org/web/20160905195941/ http://history-computer.com/ModernComputer/Basis/keyboard.html

Super User. (2024). *Sertec.* Sertec.pt. (Retrieved July 3, 2024) https://www.sertec.pt/index.php

Szubielska, M., Szewczyk, M., Augustynowicz, P., Wojciech Kędziora, & Wenke Möhring. (2024). *Adults' spatial scaling of tactile maps: Insights from studying sighted, early and late blind individuals.* PLoS ONE, 19(5), e0304008–e0304008. (Retrieved July 14, 2024) https://doi.org/10.1371/journal.pone.0304008

TEQ. (2003). *Research Review of Sound Enhanced Classroom Technology.* (Retrieved July 8, 2024) https://www.teq.com/pdf/audio-enhancements_casestudies_1.pdf

The New York Institute For Special Education. (n.d.). *History of Writing Codes for the Blind - New York Point.* Nyise.org. (Retrieved June 20, 2024) https://www.nyise.org/apps/pages/index.jsp?uREC_ID=438103&type=d&pREC_ID=948719

Thoet, A. (2017, November 22). *A short history of the audiobook, 20 years after the first portable digital audio device.* PBS NewsHour. (Retrieved June 23, 2024) https://www.pbs.org/newshour/arts/a-short-history-of-the-audiobook-20-years-after-the-first-portable-digital-audio-device

UKAAF. (2017). *Standard dimensions for the UK Braille Cell Document reference: B008.* (Retrieved June 5, 2024) https://www.ukaaf.org/wp-content/uploads/2020/03/Braille-Standard-Dimensions.pdf

Valentin Haüy Association. (2016, July 5). *"Braille 1809-2009" Writing with six dots and its future.* Association Valentin Haüy; The Wayback Machine. (Retrieved June 18, 2024) http://www.avh.asso.fr/rubriques/infos_braille/actes/Louis%20Braille%20-%20a%20brief%20overview.htm

Van Rompuy, W. (2024). *Hall braille typewriter.* Typewriter.be. (Retrieved July 7, 2024) https://www.typewriter.be/hallbraille.htm

VISÃO. (2019, August 5). *Há uma VISÃO em braille para integrar e informar.* Visão; Visão. (Retrieved July 20, 2024) https://visao.pt/iniciativas/2019-08-05-ha-uma-visao-em-braille-para-integrar-e-informar/

VISÃO. (2024, August 11). *Visão | Notícias da atualidade nacional e internacional.* Visão. (Retrieved July 20, 2024) https://visao.pt/

W. H. Illingworth, & American Printing House for the Blind, I. (1910). *History of the Education of the Blind.* In Internet Archive. Sampson, Low, Marston and Company, Ltd. (Retrieved June 5, 2024) https://archive.org/details/historyofeducati00whil/page/n5/mode/2up

Willings, C. (2022, June 18). *Timeline of Visual Impairments.* Teaching Students with Visual Impairments. (Retrieved July 7, 2024) https://www.teachingvisuallyimpaired.com/timeline-of-vi.html

World Health Organization. (2018, October 11). *Blindness and vision impairment.* Who.int; World Health Organization: WHO. (Retrieved June 6, 2024) https://www.who.int/en/news-room/fact-sheets/detail/blindness-and-visual-impairment

World Blind Union. (2016). *History: World Blind Union.* Worldblindunion.org. (Retrieved June 7, 2024) https://worldblindunion.org/about/history/

World Health Organization. (2015, July 14). *Change the Definition of Blindness.* The Wayback Machine. (Retrieved June 13, 2024) https://web.archive.org/web/20150714233938/http://www.who.int/blindness/Change%20the%20Definition%20of%20Blindness.pdf?ua=1

World Health Organization. (2013). *Global action plan for the prevention and control of noncommunicable diseases 2013-2020.* Who.int. (Retrieved June 6, 2024) https://doi.org/9789241506236

CITATIONS & TRANSLATIONS

PAGE 25

“Good design, when it’s done well, becomes invisible. It’s only when it’s done poorly that we notice it.”

FBTB. (2022). *FBTB22: Jared Spool – What Got UX Here Won’t Get UX There.* https://youtu.be/P_ES54EBaCw?si=VBQNM1nyBYls88QS

PAGE 60

“A one–eyed man is far less complete than a blind man.
He knows what he lacks.”

Hugo, V. (1831). *The Hunchback of Notre Dame: Vol. Book 1* (Chapter 5). Gosselin.

PAGE 61 & 64

“Suponho que uma das razões do silêncio sobre a figura de Castilho, é que todo o nosso conhecimento dele é mais ao menos apenas exclusivamente o conhecimento que vêm da história da literatura. E a história da literatura é talvez um dos sectores da nossa história cultural em geral mais atrasado e a necessitar de uma revisão crítica global. E assim o retrato que temos do Castilho, é que é um retrato necessariamente deficiente por que é em ainda em grande medida o retrato que dele fez a geração de 70, a nossa visão da história literária em geral não mudou nada desde a geração de 70. O último autor que se descobriu na nossa literatura foi o último autor que a geração de 70 ainda conheceu foi Gil Vicente a partir daí não há mais nenhuma descoberta. Os quadros permanecem perfeitamente idênticos ao catálogo dos clássicos é o mesmo, as tabelas de valorização literária são as mesmas e necessar-iamente o retrato do Castilho sofre disso mesmo. A geração de 70 na razão que lembra pós a ele é bastante vigorosa, e o retrato que faz dele é um retrato polêmico, retrato redutor simplista, extremamente caricaturante e a nossa visão dele padece de isso mesmo, padece de nunca ter levado uma visão crítica bastante vigorosa.”

“(...) Ele re-multiplica as edições de obras, como vai adaptando ao gosto da época quando se faz historiador amador, quando é preciso, porque o gosto da época vai premediar avalismo.

Quando se faz pedagógico porque tem uma consciência bastante grande da lei da oferta e da procura, e procura saber o que o meio ambiente (...) vai exigindo em determinada época.” José Alberto Osório Mateus.

Original version in portuguese. RTP Arquivos. (1975, August 2). *Castilho Morreu Há Cem Anos – Parte I & II*. RTP Arquivos. https://arquivos.rtp.pt/conteudos/castilho-morreu-ha-cem-anos-parte-i/

PAGE 62 & 63

“António Feliciano de Castilho procurou defender uma escola aberta (...) que fosse feita para os jovens (...) se sentissem bem, à vontade, alegres e não uma escola onde os jovens estivessem oprimidos pelo terror. Foi um dos aspectos notáveis dessa sua campanha.”

“Um outro aspecto, e esse muito particularmente atual, (...) foi talvez o primeiro pugnador da democratização da escola primária. Numa época em que a maior parte dos jovens não frequentava a escola primária porque não tinha possibilidades de o fazer. Este (...) procurou, defendeu e lutou porque a escola fosse uma escola popular e aberta a todos. Este aspecto, ainda hoje perfeitamente atual, poderá surpreender algumas pessoas por quanto a campanha de Castilho é pouco conhecida (...)”.

Original version in portuguese. Annotations by Dr. Fernando Castelo Branco, in collaboration with the Gulbekian foundation.

“O ler, escrever e contar devem ser populares e plebeus. Património geral e não privilégio. Regra e não exceção, e tão rara exceção como até hoje.”

“A Escola primária deve ser tão franca e tão obrigativa a todos como a pia batismal.”

(CAS 371.1 22557 Dep. Lisboa: Instituto Gulbenkian de Ciência, 1975)

Castilho, A. F. (1975). *Correspondência pedagógica de António Feliciano de Castilho*. Biblioteca da Universidade de Trás-os-Montes e Alto Douro (UTAD). https://catalogo.biblioteca.utad.pt/cgi-bin/koha/opac-detail.pl?biblionumber=32021

PAGE 79

“Kerr, found that blind people could scan their images, requiring more time to traverse farther distances. Furthermore, the increase in time with distance was the same as that found for sighted subjects (...) Kerr took to indicate that the functional properties of “visual” mental imagery are not visual, but rather are spatial (...). For example, subjects could have used tactile images, imagining moving their hand along the imagined scene. Similarly, Kerr found that blind people took more time to inspect images of smaller objects, just as do sighted people.”

Arditi, A., Holtzman, J. D., & Kosslyn, S. M. (1988). *Mental imagery and sensory experience in congenital blindness*. Neuropsychologia, 26(1), 1–12. https://doi.org/10.1016/0028-3932(88)90026-7

PAGE 80

“Students with a vision impairment started slower at reading single words than their normally sighted peers. (...) Single words were read faster than text. Reading speeds increased with increased visual acuity and with practice.”

Loh, L., Mallika Prem Senthil, & Constable, P. A. (2024). *A systematic review of the impact of childhood vision impairment on reading and literacy in education*. Journal of Optometry, 17(2), 100495–100495. https://doi.org/10.1016/j.optom.2023.100495

“Both groups of blind participants tended to learn the map faster than blindfolded sighted controls, and response times were also faster for blind participants than for blindfolded sighted participants. This pattern of results confirms previous studies in which blind people responded faster than sighted people in spatial tasks in the haptic domain.”

Szubielska, M., Szewczyk, M., Augustynowicz, P., Wojciech Kędziora, & Wenke Möhring. (2024). *Adults’ spatial scaling of tactile maps: Insights from studying sighted, early and late blind individuals*. PLoS ONE, 19(5), e0304008–e0304008. https://doi.org/10.1371/journal.pone.0304008

PAGE 82

“Indivíduos cegos precisam ser extremamente engenhosos e 200% melhores no que fazem se quiserem ter ao menos uma chance de competir (por uma posição bem remunerada em qualquer lugar)”. “(...) Ser engenhoso é apenas o primeiro passo, não se pode ser preguiçoso ou se distrair do que é necessário, porque, se a oportunidade surgir, alguém será escolhido no seu lugar.”

Original version in portuguese. Maia, W. (2020, June 6). *Recursos de Acessibilidade dos smartphones para deficientes visuais.* www.youtube.com. https://www.youtube.com/watch?v=8oJuD-HAcrI

PAGE 83

“Loneliness and social isolation occur as part of a complex interactive process involving other factors, especially difficulties with everyday functional activities. (...) Loneliness is linked more strongly to how people experience their visual impairment rather than the clinical assessment of their vision; this highlights the importance of understanding people’s personal experience of sight loss.”

Hodge, Dr. Suzanne., & Eccles, Dr. Fiona. (2014). *Loneliness, social isolation and sight loss Research Findings.* https://www.pocklington.org.uk/wp-content/uploads/2020/10/Loneliness-social-isolation.pdf

“A pessoa com cegueira ou baixa visão adquirida confronta-se na maioria das vezes, com graves problemas inerentes à dimensão psicológica (...) O Braille é, neste processo, uma ferramenta fundamental de acesso ao conhecimento e inclusão da pessoa cega, numa sociedade que deverá ser lugar de todos e para todos.”

Original version in portuguese. Instituto Nacional para a Reabilitação I.P. (2021). *Compilação das comunicações apresentadas no seminário comemorativo do Dia Mundial do Braille de 2020.* Núcleo Para O Braille E Meios Complementares de Leitura, 978-989-8051-21-9. https://www.inr.pt/documents/11309/48776/Publica%C3%A7%C3%B5es+Semin%C3%A1rio+Braille+2020/c7a598e4-de93-4fef-ad3b-5b3862b53973

PAGE 94

“Epiphany on the streets of Paris in 1781 when he had stumbled into a street tavern where a number of blind people had been paid by the proprietor to dress up in clown outfits (...) and play music instruments badly, and be mocked and laughed at, it had basically been their job.“

Letterform Archive. (2022, August 17). *The Tactile Book: Embossing Systems for Blind Readers*. YouTube. https://www.youtube.com/watch?v=D2vavAAaw1k&list=PL-zoc4IxuNbZF3P2f6-P2MjDhuWkk0zpk&index=4

PAGE 98

“There are people still reading Moon type even into the 21st Century, and only recently [specialists] just continued Moon type.”

APH American Printing House for the Blind. (2021, May 11). *First Raised Letters: Early Efforts in Embossed Line Type*. Youtube. https://www.youtube.com/watch?v=yMx4p97XnjA

PAGE 110

“Embora seja considerado o sistema de leitura e escrita das pessoas com deficiência visual, algumas pessoas com baixa visão conseguem, com recurso a produtos de apoio (software de ampliação, lupas ou impressões ampliadas) aceder à informação de forma funcional, não tendo portanto a necessidade de utilizar o Braille. Para além destes, também há casos de pessoas cegas que não dominam o sistema.

Sendo simples, a aprendizagem do Braille por parte das pessoas com deficiência visual pode estar condicionada por vários fatores como limitações psicomotoras, motivação, idade em que surgiu a deficiência, etc. Por outro lado, a cada vez maior utilização das Novas tecnologias como computadores e smartphones, faz com que o Braille não seja muitas vezes uma opção no que respeita ao acesso à informação.”

Original version in portuguese. ACAPO. (2024). *Braille*. Associação Dos Cegos E Amblíopes de Portugal. https://www.acapo.pt/deficiencia-visual/perguntas-e-respostas/braille

PAGE 113 & 114

“A colecção de livros em Braille compreende cerca de 2.900 títulos / 9.000 volumes, entre os quais se inclui o primeiro livro impresso em Portugal, sendo a temática muito variada: psicologia, filosofia, xadrez, tiflologia, etc. As áreas com maior expressão são os manuais escolares e a literatura, onde o género dominante é o romance, embora também inclua poesia e teatro. A literatura infanto-juvenil está igualmente representada.”

“A colecção de Música em Braille contém cerca de 4.000 títulos. Engloba obras didácticas e diferentes géneros de música clássica de compositores como Mozart, Beethoven, Mendelssohn, etc. As obras são para canto e instrumentos, predominando o piano.”

“São cerca de 50 os periódicos - portugueses e estrangeiros - que integram esta colecção, 25 dos quais em continuação, abrangendo temáticas diversas, incluindo a da deficiência visual. Destacam-se as publicações Poliedro, Rosa dos Ventos e Ponto e Som, revistas portuguesas em Braille que merecem realce quer pela sua longevidade, quer pelos serviços culturais e informativos prestados aos deficientes visuais. A revista Ponto e Som é publicada pela BNP, trimestralmente, em Braille e sonoro, desde 1974.”

Original version in portuguese. Biblioteca Nacional de Portugal. (2024). *Recursos Braille*. Bnportugal.gov.pt. https://www.bnportugal.gov.pt/index.php?option=com_content&view=article&id=125&Itemid=153&lang=pt

PAGE 117

“Fazemos a transcrição de livros consoante as necessidades, e consoante as solicitações que nos são feitas. Nos últimos anos temos vindo a preocupar-nos com materiais de dupla leitura. Penso que é por aí que devemos ir (...)”. João Belchior (2017).

Original version in portuguese. RTP Arquivos. (2017). *Livros em braille.* Arquivos.rtp.pt. https://arquivos.rtp.pt/conteudos/livros-em-braille-2/

IMAGES

3D Hubs. (2016). *3D Printed Picture Books Help Blind Children Read* [3D Printing]. In Medium. (Retrieved July 10, 2024) https://medium.com/@3dhubs/famous-children-s-books-can-now-come-alive-for-blind-children-thanks-to-3d-printing-a4620bdc656f.

ACAPO. (n.d.). *ACAPO Logo*. In Águeda Local Delegation Website. (Retrieved July 13, 2024) https://www.uf-aguedaeborralha.pt/freguesia/instituicoes/18

Agrupamento de Escolas de Ílhavo. (2022). *A 22/01 comemora-se o dia do Intérprete de Língua Gestual Portuguesa* [Video Screenshot]. In Youtube. (Retrieved July 15, 2024) https://youtu.be/fukuuHWPblQ?si=hBy15yym5AmQ-BB2

American Printing House. (1993). *Portrait of Valentin Hauy* [Photo Illustration Portrait]. In American Printing House. (Retrieved July 10, 2024) https://aphmuseum.org/record/illustration-valentin-hauy/

Anonymous. (2017). *INCLUSÃO: ALFABETO EM BRAILLE* [Scanning]. In atividadeparaeducacaoespecial.com. (Retrieved June 10, 2024) https://atividadeparaeducacaoespecial.com/inclusao-alfabeto-em-braille/

APEC. (2024). *APEC Virtual Learning Environment*. In APEC Moodle. (Retrieved June 5, 2024) https://moodle.apec.org.pt/

APEC. (2023). *APEC logo*. In APEC Association for the Promotion of Education for the Blind. (Retrieved June 5, 2024) https://www.apec.org.pt/Novologotipo.html

Arnald, G. (1900). *Narcissus and Echo* [Landscape oil painting]. (Retrieved July 15, 2024) https://www.meisterdrucke.uk/fine-art-prints/George-Arnald/1172965/Narcissus-and-Echo.html

Arquivo Municipal de Lisboa. (2015). *Photographic portrait of António Feliciano de Castilho*. In Lisbon Municipal Archive. (Retrieved June 7, 2024) https://arquivomunicipal.lisboa.pt/arquivo-fotografico

Associação Promotora do Ensino dos Cegos. (2018). *Example of Single-sided Embossing* (Interpoint) [Photograph]. In Facebook. (Retrieved July 9, 2024) https://www.facebook.com/AssociacaoPromotoraEnsinoCegos/photos/a.162462434542933/162462764542900/?type=3

Australian Braille Authority. (2020, October 18). *Physical Specifications for Braille*. Brailleaustralia.org. (Retrieved June 5, 2024) https://brailleaustralia.org/about-braille/physical-specifications-for-braille/

BBC. (2020). *An operation being carried out at the hospital* [Photograph]. In University Hospitals Birmingham NHS Trust. (Retrieved June 20, 2024) https://bbc.com/news/uk-england-birmingham-54463831

Biblioteca Nacional de Portugal. (2024). *Leitura para deficientes visuais* [Screenshot]. In bnportugal.gov.pt. (Retrieved July 13, 2024) https://www.bnportugal.gov.pt/index.php?option=com_content&view=article&id=123&Itemid=128&lang=pt

Bibliothèque Diderot de Lyon. (1817). *Notice historique sur l'Institution Royale des Jeunes Aveugles*. l'Institution royale des Jeunes aveugles. (Retrieved July 8, 2024) http://numerisation.bibliotheque-diderot.fr/R/Q8RS2S1IAN7G9N8XEUMSIQEJM635KSXYH9LSRLFB7FGMK7MDYY-04530?func=dbin-jump-full&object%5Fid=826570&pds_handle=GUEST

Blind Scholar. (n.d.). *Slate and Stylus* [Photograph]. In blindscholar.com. (Retrieved July 13, 2024) https://www.blindscholar.com/2017/03/04/my-braille-toolbox-a-guided-trip-through-braill-writing-history/

Bristol Braille Technology. (2023). *Canute 360* [Photograph]. In bristolbraille.org. (Retrieved July 13, 2024) https://bristolbraille.org/about-canute/

Bruegel, P. (1568). *The Blind Leading the Blind* [Distemper on linen canvas]. Museo di Capodimonte, Naples, Italy. (Retrieved July 8, 2024) https://g.co/arts/wE8dZp4j87g9WEvn6

Câmara Municipal do Porto. (2024). *Feira do Livro do Porto 2024* [Photograph]. In Jornal da Feira do Livro. (Retrieved July 14, 2024) https://www.agoraporto.pt/noticias/inscricoes-abertas-para-a-participacao-na-feira-do-livro-do-porto-2024

Campos, C. (2018). *DIY Braille Embosser* [Photograph]. In Make: (Retrieved July 5, 2024) https://makezine.com/projects/diy-braille-embosser/

Campsie, P. (2021). *Essai sur divers procédés d'expéditive française of 1815* [Screen Printing]. In Charles Barbier: A hidden story. (Retrieved July 7, 2024) https://dsq-sds.org/index.php/dsq/article/view/7499/5947

Castilho, A. F. (1861). *Amor e Melancolia or Novissima Heloisa Front Cover.* Typ. da Sociedade Typographica Franco-Portugueza. (Retrieved June 11, 2024) https://books.google.com.br/books?id=Et0FAAAAQAAJ&pg=PA2#v=onepage&q&f=false

Castilho, A. F. (1853). "*Metodo Castilho para o ensino rapido e aprasivel do ler.*" In Biblioteca Nacional Digital. (Retrieved June 11, 2024) https://permalinkbnd.bnportugal.gov.pt/idurl/1/92895

Comércio com História. (2019). *Livraria Lello - Câmara Municipal do Porto* [Photograph]. In comerciocomhistoria.gov.pt. (Retrieved July 14, 2024) https://www.comerciocomhistoria.gov.pt/listings/livraria-lello-3351/

Dassel, A. (2018). *Elderly women using a magnifying glass* [Photograph]. In Pixabay. (Retrieved July 3, 2024) https://pixabay.com/photos/elderly-old-age-visual-impairment-3282517/

Dias, J. M. T. (2000). *Castilho's Portuguese Method* (Letter B) [Scientific Paper]. In Castilho, Leitura Repentina. (Retrieved July 7, 2024) https://repositorio.uac.pt/bitstream/10400.3/319/1/Jose_Teixeira_Dias_p465-479.pdf

Edinburgh College of Art Degree Show. (2010). *Tactile Map: Edinburgh* [Blind collography using found materials]. In National Library of Scotland. (Retrieved July 14, 2024) https://sensorymaps.com/?projects=tactile-map-edinburgh

fakoo.de. (n.d.). *Die Raphigrafie, Alphabete von Menschen mit Behinderung* [Typography]. (Retrieved July 7, 2024) https://fakoo.de/raphigrafie.html

Falexoo. (2014). *Dotty-Moon Font* [Braille Font]. In FONTSPACE. (Retrieved July 10, 2024) https://www.fontspace.com/dotty-moon-font-f30442

Fernandes, J. (2017). *Sistema Braille 1ª atualização 87 anos depois* [Annex]. In Blogue. (Retrieved June 5, 2024) https://www.acessibilidade.gov.pt/blogue/categoria-noticias/sistema-braille-oficializado/

Flament, D. (2018). *Braille Notetaker* [Photograph]. In Second Sense. (Retrieved July 17, 2024) https://www.second-sense.org/2018/10/braille-notetakers/

Fondation Antoine de Saint-Exupéry. (2019). *L'essentiel est invisible pour les yeux.* In Aleteia.org. (Retrieved July 4, 2024) *https://fr.aleteia.org/2019/06/27/lessentiel-est-invisible-pour-les-yeux*

Fondation Antoine de Saint-Exupéry. (2014). *The Little Prince on Asteroid B 612* [Woodcut]. In Plazzart. (Retrieved July 4, 2024) https://www.plazzart.com/fr_FR/achat/art-moderne/antoine-de-saint-exupery-d-apres-le-petit-prince-sur-l-asteroide-b-612-gravure-sur-bois-467119

Freepik. (n.d.). *Detail of Spiral Blank Pages* [Mockup]. In freepik.com. (Retrieved August 15, 2024) https://www.freepik.com/search?ai=excluded&format=search&img=1&last_filter=img&last_value=1&query=spiral+binding+mockup&selection=1&type=photo

Freepik. (2021). *Free Photo | Top view of notebooks on table* [Mockup]. In freepik.com. (Retrieved August 15, 2024) https://www.freepik.com/free-photo/top-view-notebooks-table_12062758.htm

García, T. (2023). *Details of Swell Form* ("Designing for touch") [Photograph]. In Medium. (Retrieved July 10, 2024) https://bootcamp.uxdesign.cc/designing-for-touch-975e47065935

GO Porto Gestão e Obras do Porto, E.M. (2024). *Biblioteca Pública Municipal do Porto* [Photograph]. In goporto.pt. (Retrieved August 5, 2024) https://goporto.pt/noticias/requalificacao-e-ampliacao-da-biblioteca-publica-municipal-vai-a-concurso

IAPB. (2020). *Portugal: Country Map & Estimates of Vision Loss*. In IAPB - Agency for the Prevention of Blindness. (Retrieved June 7, 2024) https://www.iapb.org/learn/vision-atlas/magnitude-and-projections/countries/portugal/

Kampus Production. (2021). *An Elderly Man Reading a Book Beside a Woman* [Photograph]. In Pexels. (Retrieved July 10, 2024) https://www.pexels.com/photo/an-elderly-man-reading-a-book-beside-a-woman-7477725/

Le Petit Prince. (2022). *The Little Prince – Tactile Braille edition*. In Le Petit Prince. (Retrieved July 4, 2024) https://www.lepetitprince.com/en/whats-new-in-the-store-en/the-little-prince-tactile-braille-edition/

Li, E. (2021). *Photo of Magnifying Glass on Top of Braille* [Photograph]. In Pexels. (Retrieved August 4, 2024) https://www.pexels.com/photo/photo-of-magnifying-glass-on-top-of-braille-7188802/

Lucas, T. (1838). *Lucas Tactile Alphabet System. In Alternative Visualization of Textual Information for People with Sensory Impairment.* (Retrieved July 20, 2024) https://trepo.tuni.fi/bitstream/handle/10024/67533/951-44-6443-5.pdf?sequence=1

Marion. (2024). *The Little Prince – Tactile Braille edition* (Page excerpt) [Photograph]. In Leboncoin.fr. (Retrieved July 4, 2024) https://www.leboncoin.fr/ad/livres/2838998875

Miroshnichenko, T. (2021a). *Close-up Photo of Braille Book* [Photograph]. In Pexels. (Retrieved August 4, 2024) https://www.pexels.com/es-es/foto/manos-libro-leyendo-conmovedor-6609519/

Miroshnichenko, T. (2021b). *Close-Up Shot of Hands on a Braille Book* [Photograph]. In Pexels. (Retrieved June 9, 2024) https://www.pexels.com/photo/close-up-shot-of-hands-on-a-braille-book-6606226/

Mockups Design. (2020, October). *Free binded book mockup - Mockups Design*. Mockups Design. (Retrieved August 4, 2024) https://mockups-design.com/free-binded-book-mockup/

Monahan Papers (1700). *Large French Green Wax Seal.* [Photograph]. In Monahan Papers. (Retrieved July 4, 2024) https://www.monahanpapers.co/products/large-french-green-wax-seal-on-original-document

Monteiro, L. (2016a). *Como se faz a VISÃO braille - Impressão* [Photograph]. In visao.pt. (Retrieved July 14, 2024) https://visao.pt/atualidade/sociedade/2016-04-27-como-se-faz-a-visao-braille/

Monteiro, L. (2016b). *Como se faz a VISÃO braille - Revisão* [Photograph]. In visao.pt. (Retrieved July 14, 2024) https://visao.pt/atualidade/sociedade/2016-04-27-como-se-faz-a-visao-braille/

Moon, W. (1938). *Moon Tactile Alphabet System* [Photograph]. In Moon Christmas Annual. (Retrieved July 4, 2024) https://www.nyise.org/apps/pages/index.jsp?uREC_ID=438103&type=d&pREC_ID=948713

Musée Louis Braille. (n.d.). *Raphigraph by Pierre François Victor Foucault* [Photograph]. In His inventions. (Retrieved June 23, 2024) https://museelouisbraille.com/en/ses-inventions

Nilov, M. (2021). *Man Using the Braille in Front of a Computer* [Photograph]. In Pexels. (Retrieved June 9, 2024) https://www.pexels.com/photo/man-using-the-braille-in-front-of-a-computer-6981101/

Perkins School for the Blind. (1951). *Perkins Brailler* [Typewriter]. In brailler.perkins.org. (Retrieved July 11, 2024) https://brailler.perkins.org/pages/perkins-brailler

Perkins School for the Blind. (n.d.). *Large Cell Perkins Brailler Keyboard* [Typewriter]. In everydaysight.com. (Retrieved July 2, 2024) https://www.everydaysight.com/braille-typewriters/

Reliure. (n.d.). *Example of Comb Binding* [Mockup]. In reliure.info. (Retrieved August 3, 2024)
https://www.reliure.info/reliure-clickbind.php

Rodrigues, B. (1895). *Jornal dos cegos n.º1 and 4* [Newspaper].
In Lisbon Municipal Digital Hemeroteca. (Retrieved June 20, 2024)
https://hemerotecadigital.cm-lisboa.pt/Periodicos/JornaldosCegos/JornaldosCegos.htm

RTP Arquivos. (1975). *Last signature made by Castilho in Coimbra as a student* [Documentary].
In Castilho Morreu Há Cem Anos – Parte I & II. (Retrieved June 3, 2024)
https://arquivos.rtp.pt/conteudos/castilho-morreu-ha-cem-anos-parte-i/

Santarelli, R. (2019). *Braille Embosser* [Photograph]. In flickr.com. (Retrieved July 17, 2024)
https://www.flickr.com/photos/culturaargentina/40658221513/

Sargent, J. S. (1919). *Gassed* (London, United Kingdom) [Oil on canvas].
Imperial War Museums. (Retrieved July 8, 2024)
https://g.co/arts/cnxSd6Hh6L8FFPA49

Smith Corona. (1960). *Smith Corona - SMC* [Electronic Typewriter].
In Atlas Showroom. (Retrieved July 19, 2024)
https://atlasshowroom.com/products/1960s-smith-corona-vintage-electronic-typewriter

The British Museum. (n.d.-a). *Royal temple lintel of Amenemhat III* [Temple Relief].
(Retrieved July 8, 2024)
https://www.britishmuseum.org/collection/object/Y_EA1072

The British Museum. (n.d.-b). *Sumerian Cuneiform Tablet, Shuruppak* (ca.2500 BCE)
[Clay Tablet]. (Retrieved July 8, 2024)
https://www.britishmuseum.org/collection/object/W_1896-0612-46

The National Federation of the Blind. (1829). *Example of raised letter system used by Haüy*
[Book Photograph]. In The National Federation of the Blind. (Retrieved July 2, 2024)
https://nfb.org/images/nfb/publications/braille/thefirstpublicationofthebraillecode.html

Thirdman. (2021a). *Double-sided Embossing* (Duplex) [Photograph].
In Pexels. (Retrieved July 11, 2024)
https://www.pexels.com/photo/papper-blindskrift-vertikalt-skott-hjalpmedel-7265421/

Thirdman. (2021b). *Pages with Braille Text* [Photograph]. In Pexels. (Retrieved July 11, 2024)
https://www.pexels.com/photo/pages-with-braille-text-7265419/

UK Association for Accessible Formats. (2017). *Standard Dimensions Braille Cell.*
In PDF Document. (Retrieved June 5, 2024)
https://www.ukaaf.org/wp-content/uploads/2020/03/Braille-Standard-Dimensions.pdf

Unblast. (n.d.). *Ring Binder* [Mockup]. In unblast.com. (Retrieved August 3, 2024.)
https://unblast.com/4-ring-binder-mockup/

Underwood Typewriter Company. (1914). *Underwood Model 5* [Typewriter].
In National Museum of American History. (Retrieved July 19, 2024)
https://americanhistory.si.edu/collections/nmah_998196

Unknown Author. (2017). *Elderly women reading with a child* (CC0 Public Domain) [Photograph]. In PxHere. (Retrieved July 11, 2024) https://pxhere.com/pt/photo/883613?utm_content=shareClip&utm_medium=referral&utm_source=pxhere

XUEZHIYOU. (2023). *Multilingual Scan Language Translation Pen* [Photograph]. In talkpens.com. (Retrieved July 19, 2024) https://www.talkpens.com/scanner-pen/3-46-inch-4g-wifi-two-ways-instant.html

Yates Thompson. (1290). Cistercian nuns in chapel (La Sainte Abbaye) [Medieval manuscript]. In The British Library. (Retrieved July 8, 2024) https://www.meisterdrucke.ie/fine-art-prints/French-School/1354035/Yates-Thompson-MS-11-f.6v-'La-Sainte-Abbaye'-by-Pierre-de-Blois,-c.1290-(ink,-colour-&-gold-on-vellum).html

AVISÃO

Amor e Melancolia

1861

Poema de António
Feliciano de Castilho

Nivel 1 Braille:
Alfabeto, Pontuação
e Exemplos

Adaptação e Ilustração
Mariana Couto

U.PORTO

FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

AVISÃO Amor e Melancolia · António Feliciano de Castilho · Nivel 1 Braille: Alfabeto, Pontuação e Exemplos · 1861

AVISÃO

Amor e Melancolia

1861

Poema de António
Feliciano de Castilho

Nivel 1 Braille:
Alfabeto, Pontuação
e Exemplos

Adaptação e Ilustração
Mariana Couto

U.PORTO

FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

A VISÃO
Amor e Melancolia
1861

A VISÃO Amor e Melancolia António Feliciano de Castilho Nivel 1 Braille: Alfabeto, Pontuação e Exemplos 1861

A VISÃO

Amor e Melancolia

1861

Poema de António
Feliciano de Castilho

Nivel 1 Braille:
Alfabeto, Pontuação
e Exemplos

Adaptação e Ilustração
Mariana Couto

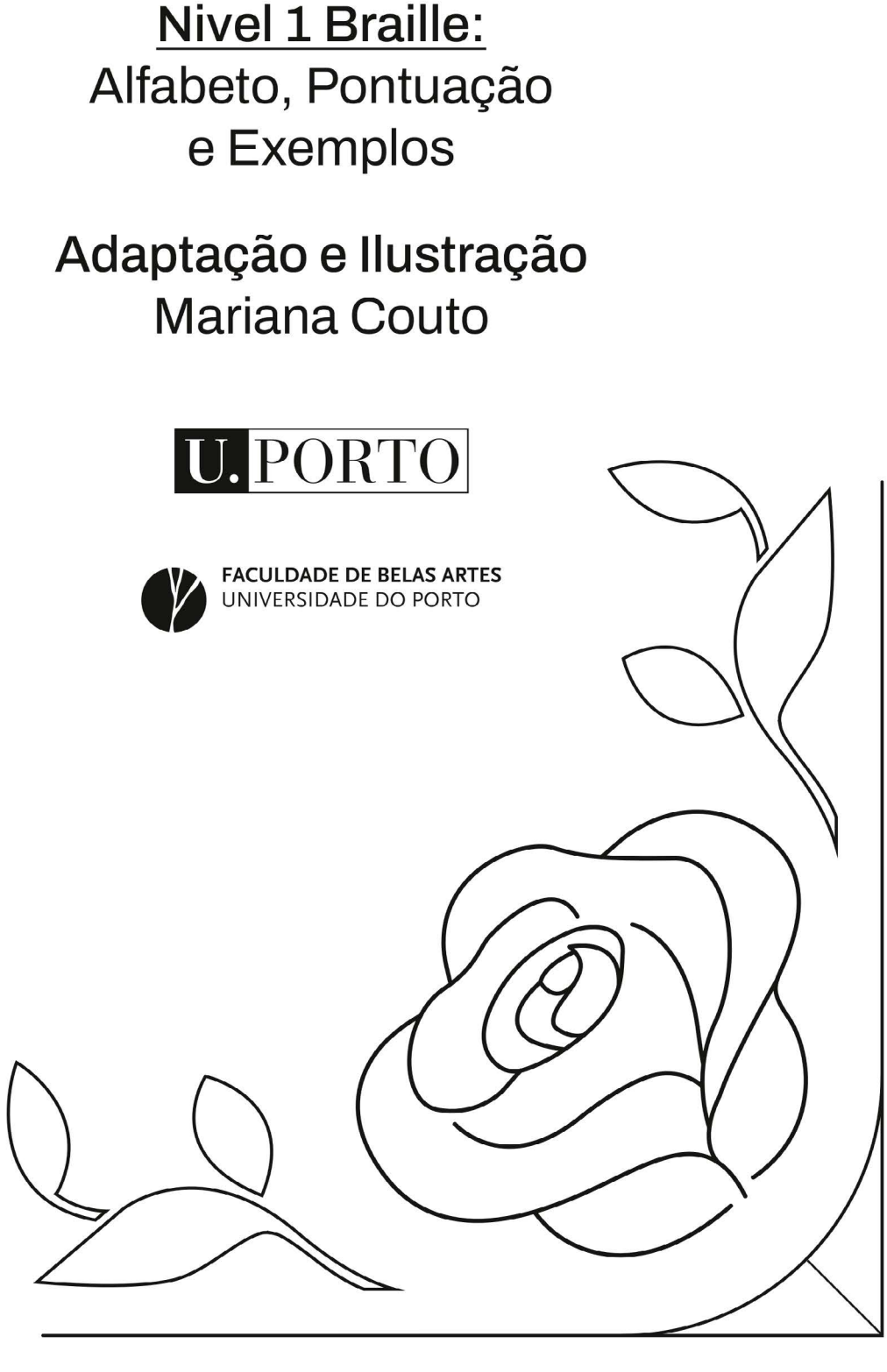
U.PORTO

FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

A VISÃO

Amor e Melancolia

1861



A VISÃO Amor e Melancolia António Feliciano de Castilho Nivel 1 Braille: Alfabeto, Pontuação e Exemplos 1861

A VISÃO

Amor e Melancolia

1861

A VISÃO
Amor e Melancolia
1861

Poema de António
Feliciano de Castilho

Nivel 1 Braille:
Alfabeto, Pontuação
e Exemplos

Adaptação e Ilustração
Mariana Couto

U.PORTO

FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

A VISÃO Amor e Melancolia António Feliciano de Castilho Nivel 1 Braille: Alfabeto, Pontuação e Exemplos 1861

⠠⠠ ⠠⠝⠕⠎⠎⠁ ⠠⠙⠕⠗
⠠⠏⠕⠗ ⠺ ⠠⠍⠑⠇⠁⠝⠉⠕⠇⠊⠁

⠠⠠⠎⠕⠝⠓⠑⠊ ⠉⠕⠍ ⠁ ⠠⠍⠕⠗⠞⠑
⠠⠠⠑ ⠉⠕⠍ ⠕ ⠠⠍⠁⠗ ⠠⠙⠑ ⠠⠁⠎⠞⠊⠇⠙⠑

⠠⠠⠉⠕⠍ ⠕ ⠠⠎⠕⠇ ⠠⠙⠑ ⠠⠏⠕⠗⠞⠥⠛⠁⠇
⠠⠠⠑ ⠠⠁⠎ ⠠⠎⠑⠞⠑ ⠠⠏⠑⠗⠁⠎
⠠⠠⠝⠁ ⠠⠉⠁⠗⠝⠁⠗

⠠⠠⠞⠕⠙⠁ ⠁ ⠠⠝⠕⠞⠊⠉⠊⠁ ⠠⠙⠁ ⠠⠍⠑⠇⠁⠝⠉⠕⠇⠊⠁
⠠⠠⠝⠁ ⠠⠎⠥⠁ ⠠⠉⠁⠗⠁

A VISÃO

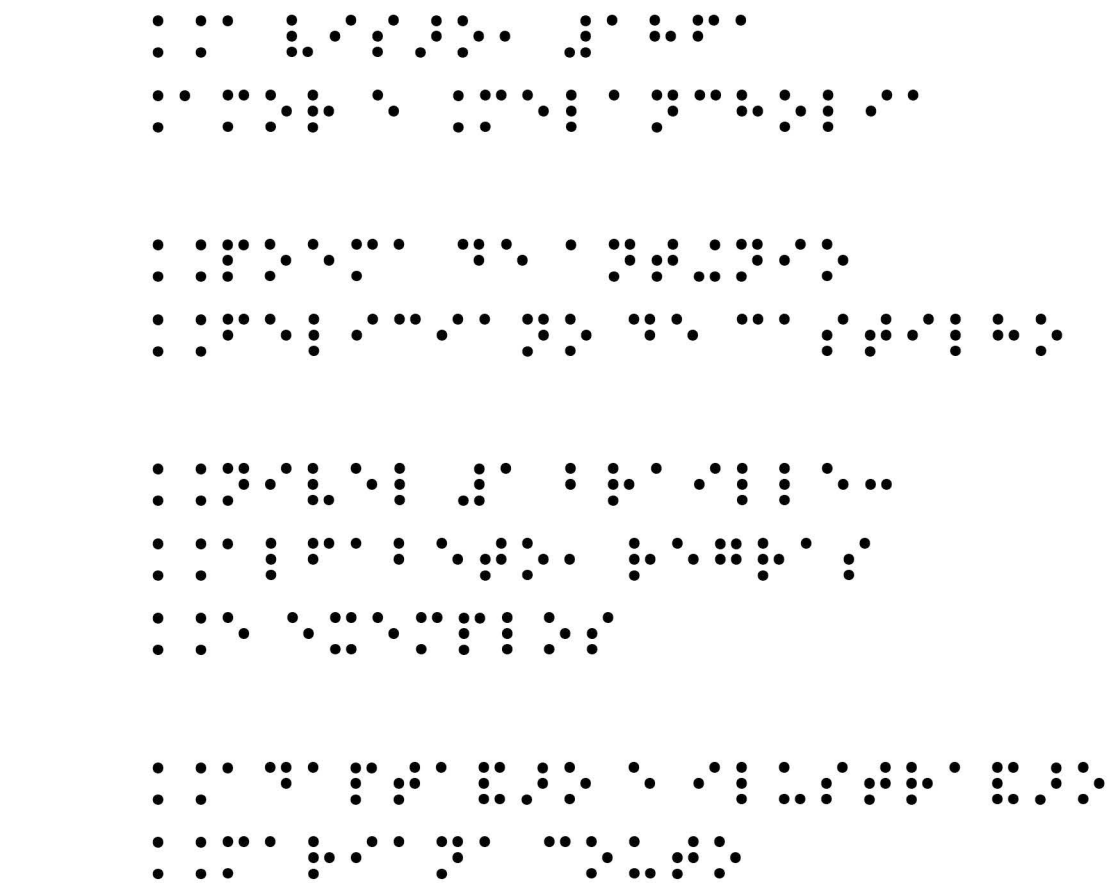
Amor e Melancolia

1861

1861

A VISÃO

Amor e Melancolia



Poema de
António Feliciano de Castilho

Nivel 1 Braille:
Alfabeto, Pontuação
e Exemplos

Adaptação e Ilustração
Mariana Couto

U.PORTO

FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

“A VISÃO”, Poema da obra “AMOR E MELANCOLIA” (1828) por António Feliciano de Castilho
Baseado na nova edição de 1861

Edição Braille: Nível 1:
Livro Ilustrado com alfabeto, pontuação e exemplos gramaticais para consulta lúdica

Design, Ilustração e Adaptação:
Mariana Couto

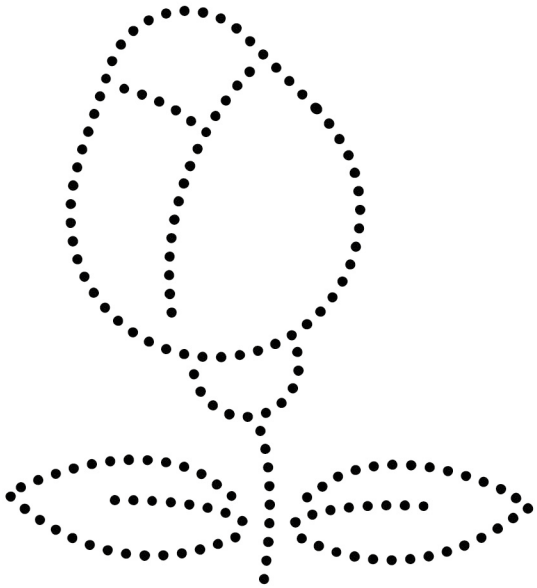
Adaptação de obra como exemplar protótipo para cariz de exemplificação e para futura avaliação

Mestrado em Design Gráfico e Projetos Editoriais, Faculdade de Belas Artes Universidade do Porto, Porto, Portugal, 2024

⠠⠠⠠

Cada quadra começa aqui.
Textos são repetidos nesta página, com uma ilustração tátil diretamente em baixo à direita. Na página à esquerda encontram-se sempre auxilios educacionais para visuais.

⠠⠍⠁⠎ ⠍⠁⠎ ⠎⠕ ⠍⠁⠎ ⠍⠑⠎⠍⠕ ⠁ ⠎⠕⠍⠑.
⠠⠎⠕⠍⠑⠝⠞⠑ ⠙⠑ ⠞⠑⠍⠏⠕⠎ ⠙⠑ ⠞⠗⠁⠃⠁⠇⠓⠕ ⠎⠕⠍⠑⠝⠞⠑
⠎⠕⠍⠑⠝⠞⠑. ⠍⠁⠎ ⠝⠁⠕ ⠙⠑⠏⠑⠝⠙⠑ ⠙⠑ ⠍⠊⠍
⠎⠕⠍⠑⠝⠞⠑ ⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕ ⠍⠑ ⠊⠍⠏⠕⠗⠞⠁
⠠ ⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕. ⠠⠍⠁⠎ ⠎⠕⠍⠑⠝⠞⠑ ⠠ ⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕
⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕ ⠍⠑ ⠊⠍⠏⠕⠗⠞⠁ ⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕
⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕ ⠍⠑ ⠎⠑ ⠎⠕ ⠠⠍⠁⠎ ⠍⠑⠥ ⠞⠗⠁⠃⠁⠇⠓⠕.



Nome do poema, Nome do livro

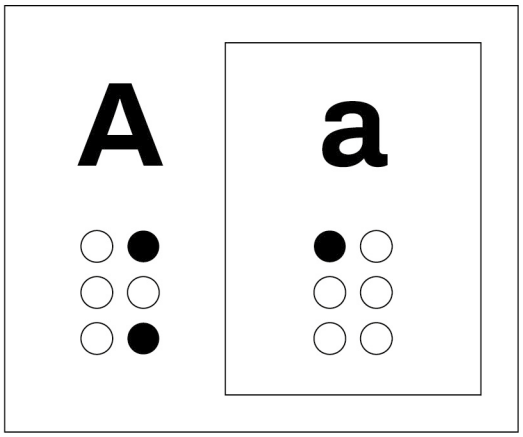
6

•

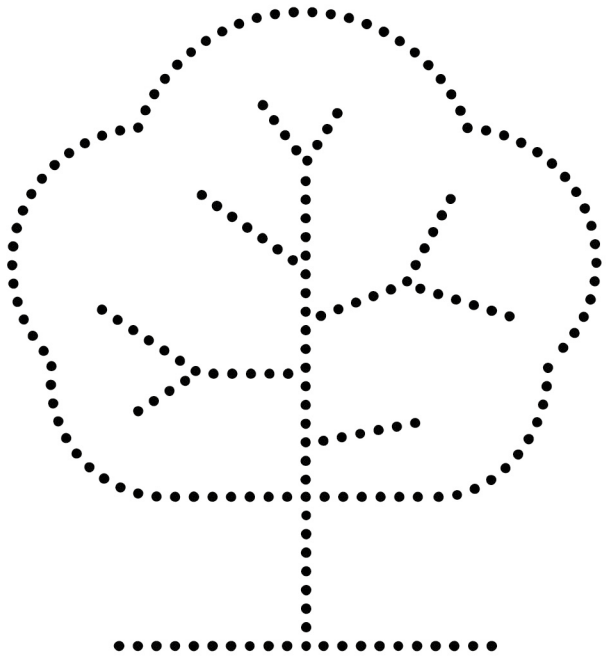
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



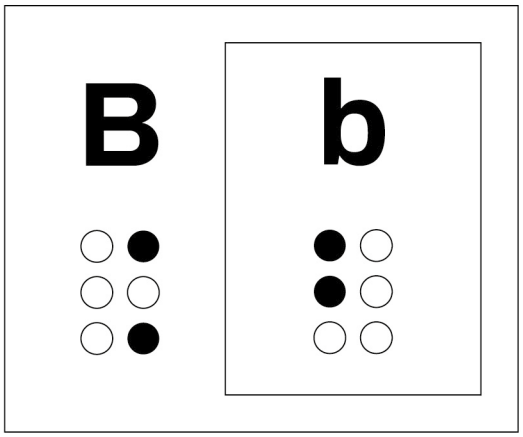
Ao longo de uma ribeira
eu passeava sozinho;
e um pássaro ouvi cantando
sobre um ramo ao pé do ninho.



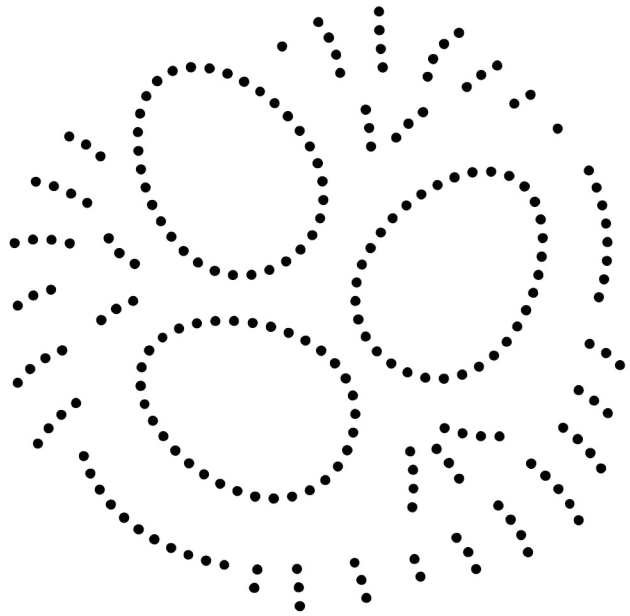
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



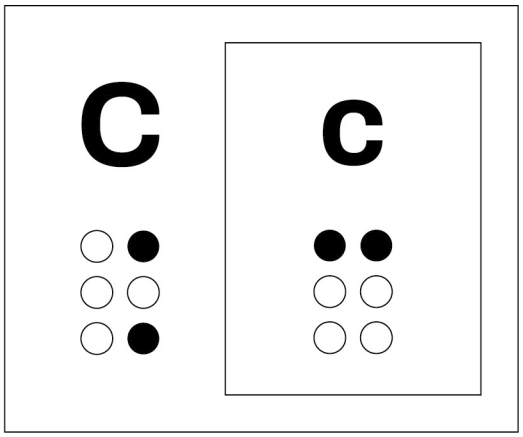
A esposa guardava os filhos
co’as asas agasalhados;
todo o vale era em silêncio;
e eles ambos sem cuidados.



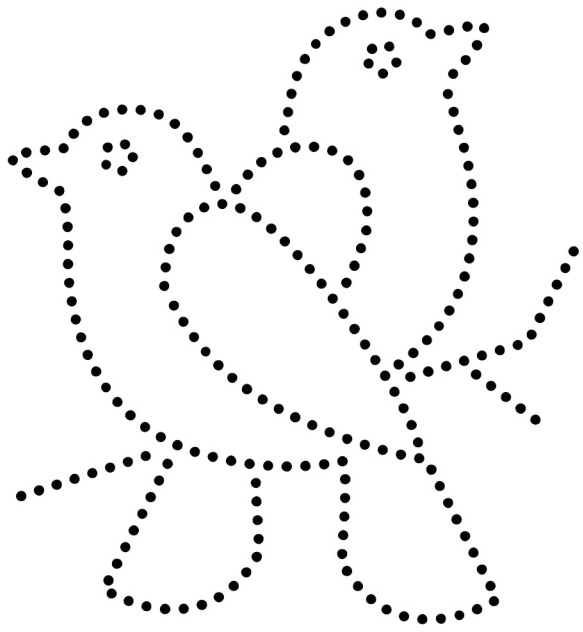
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



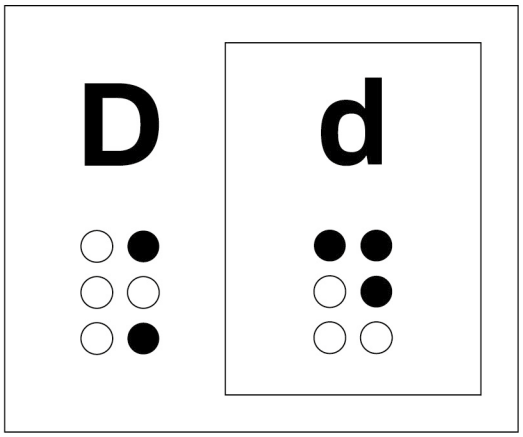
De sua vida amorosa
concebi toda a doçura;
e achei-me sozinho à beira
da corrente que murmura.



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

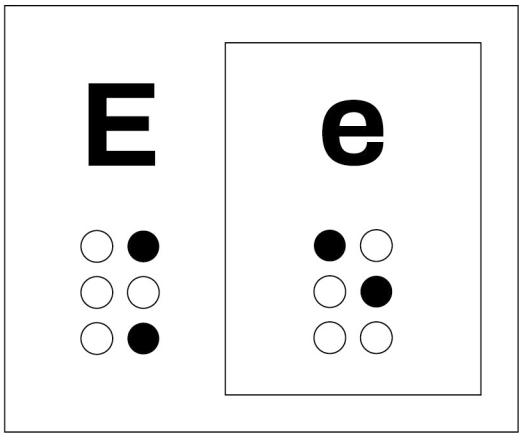


Afastei-me tristemente;
e um zephyro de passagem
me trouxe um cheiro de flores
d’entre a próxima folhagem.

A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



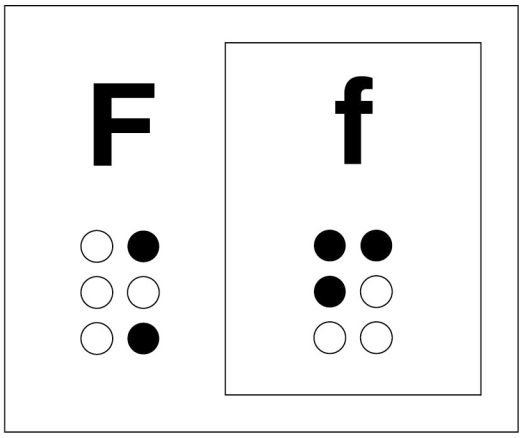
E eu disse: «Este hálito doce
«do seio de esposos vem;
«mais de uma florinha virgem
«agora se torna mãe.»

•

A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

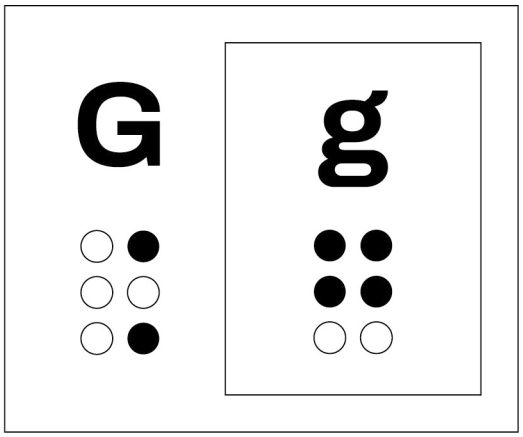


Vi que estava solitário;
e d’este aroma, o prazer
junto á beira da corrente
mais me veio entristecer.

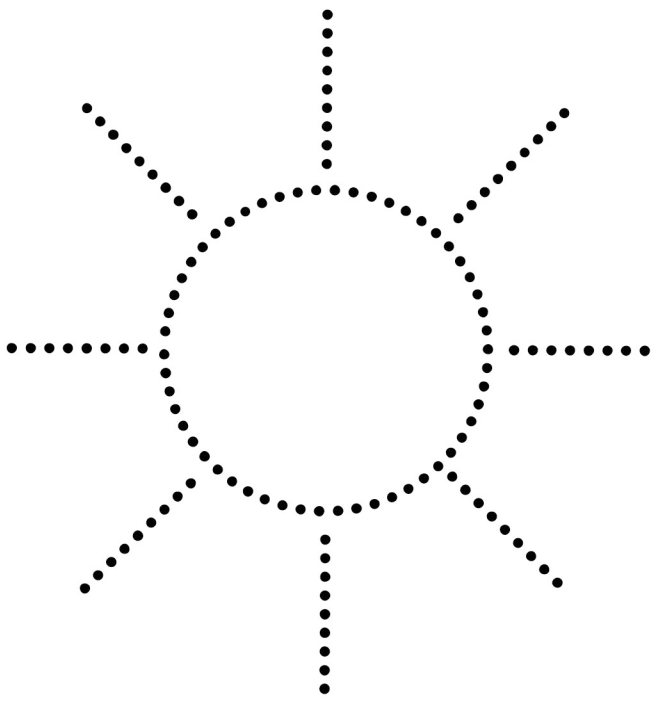
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



O sol ia quase a pôr-se;
e a frouxa luz que espargia,
as águas, e o campo, e o bosque,
tudo em púrpura tingia.

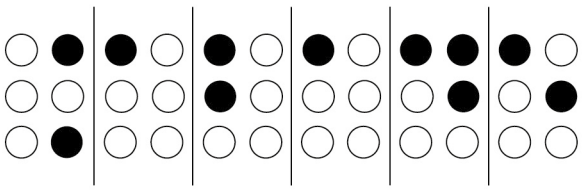


A B C D E F G H I J K L M N O P Q R S T U

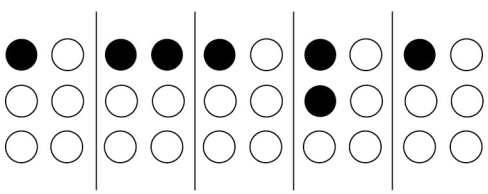
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

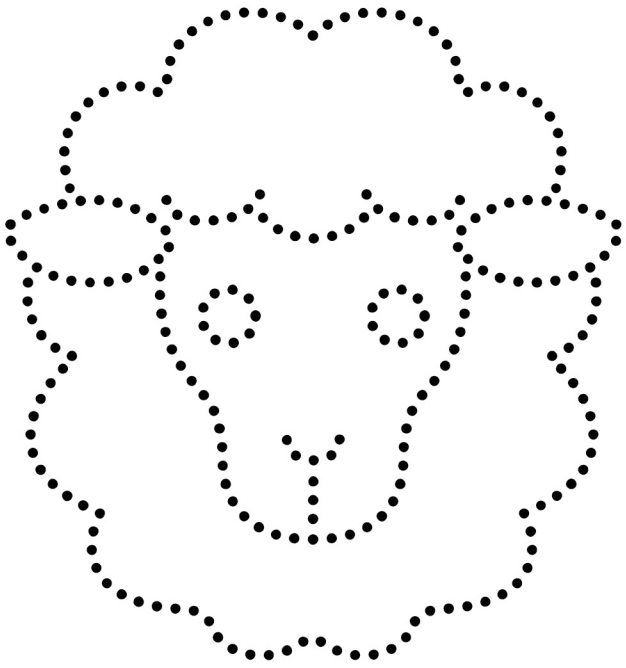
Abade



acaba



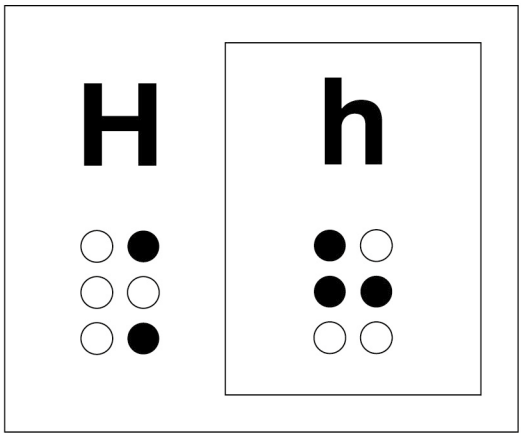
Ao longe, ouvia as pastoras,
que os seus rebanhos levavam;
eles balavam contentes,
elas de amores cantavam.



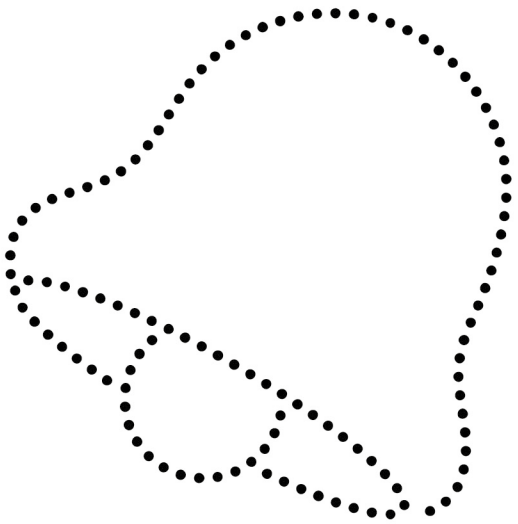
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



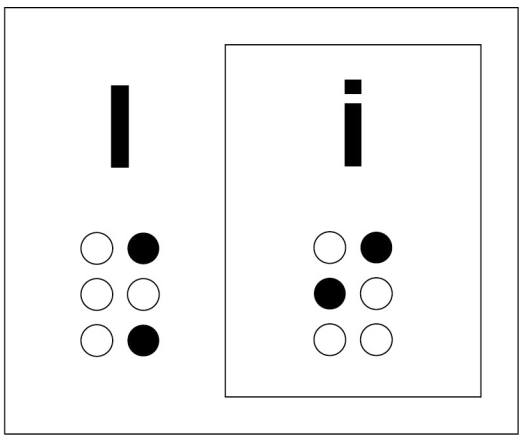
O sol se escondeu de todo;
e da Aldeia sobre a ermida,
ao longe, o sino saudoso
deu ao dia a despedida.



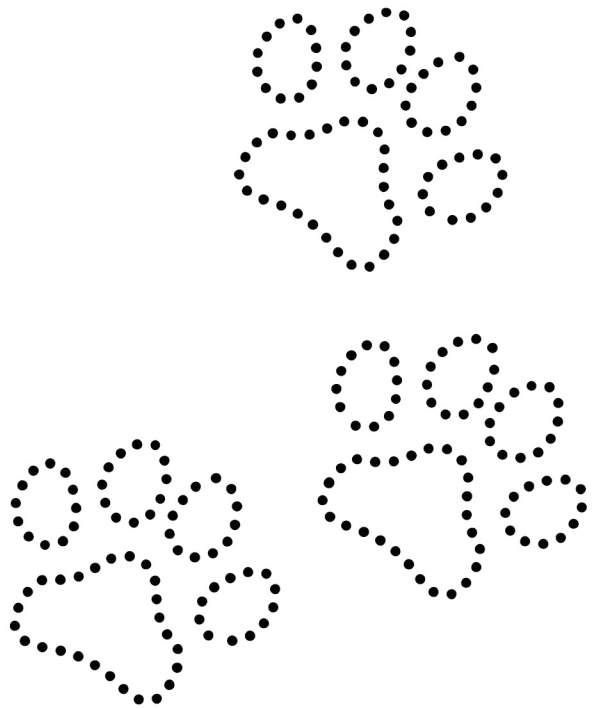
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



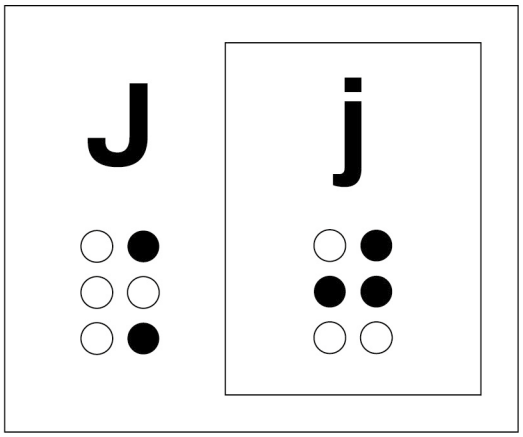
Os campos ficaram tristes.
Só, de momento em momento,
se ouvia um cão em distância,
ou brando agitar-se o vento.



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

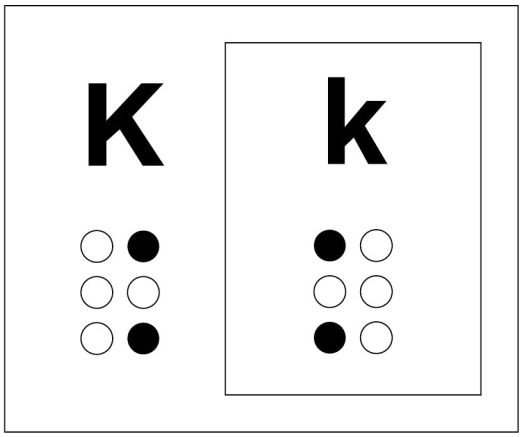


E eu me achei só, assentado
ao pé d’água que fugia;
e os sons da tarde em minh’alma
dobraram melancolia.

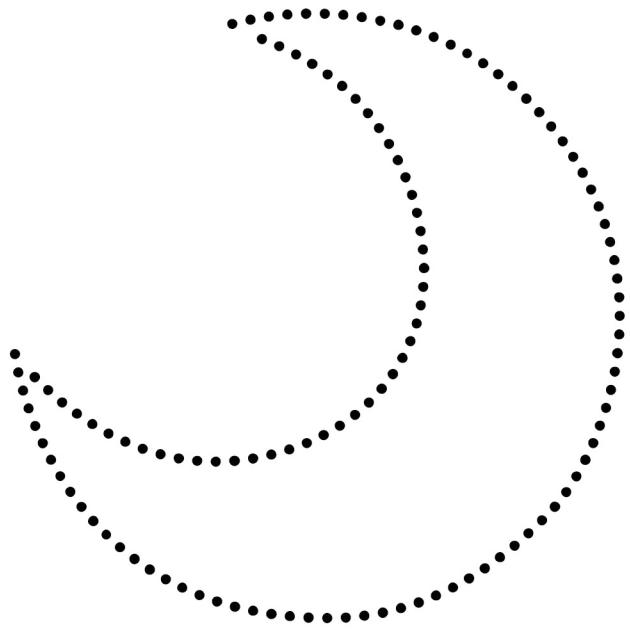
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



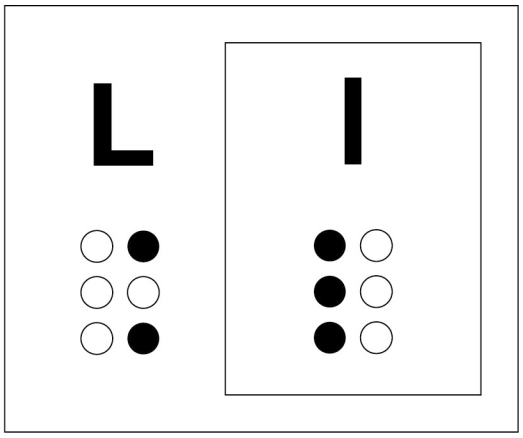
Já tinha nascido a lua
no céu formoso de estrelas;
quando boiava água a baixo
barco sem remo nem velas.



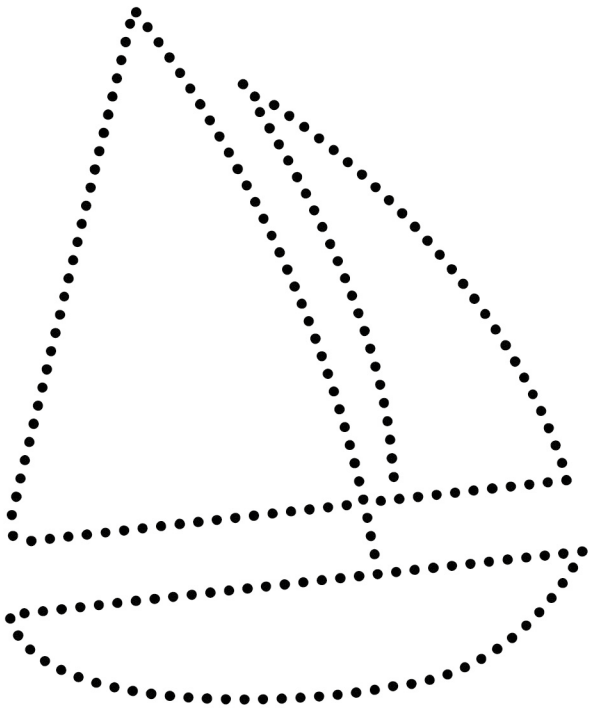
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



E o barqueiro ia cantando
não sei que saudosas mágoas ...
assentado sobre a pôpa,
debruçado sobre as águas;

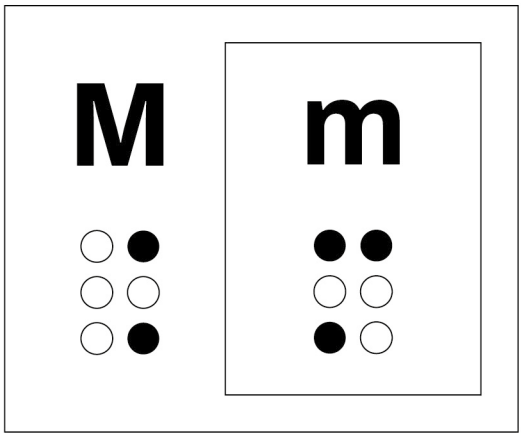


•

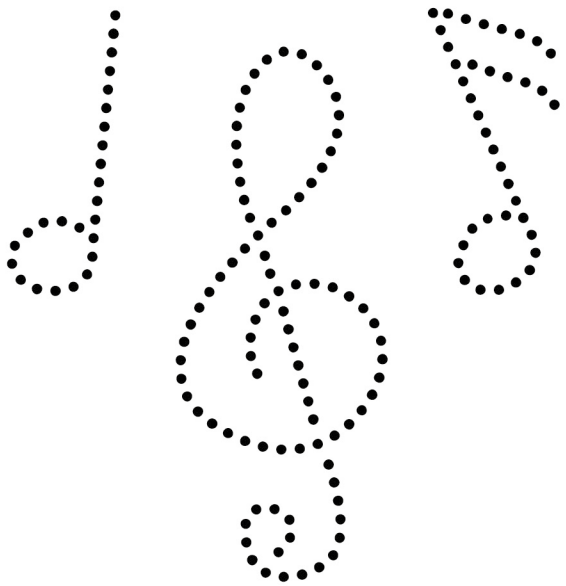
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



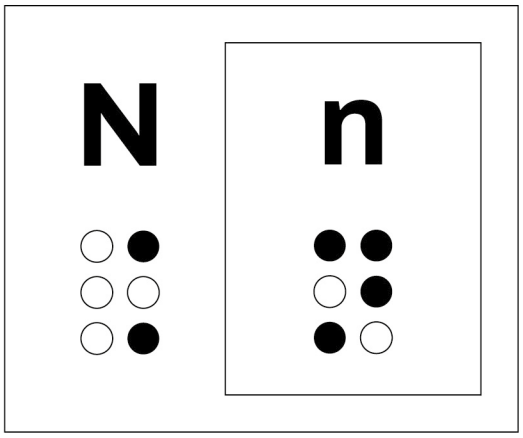
e quando ele interrompia
seu cantar, e assobiava,
mulher que vinha com ele,
em voz muito doce cantava.



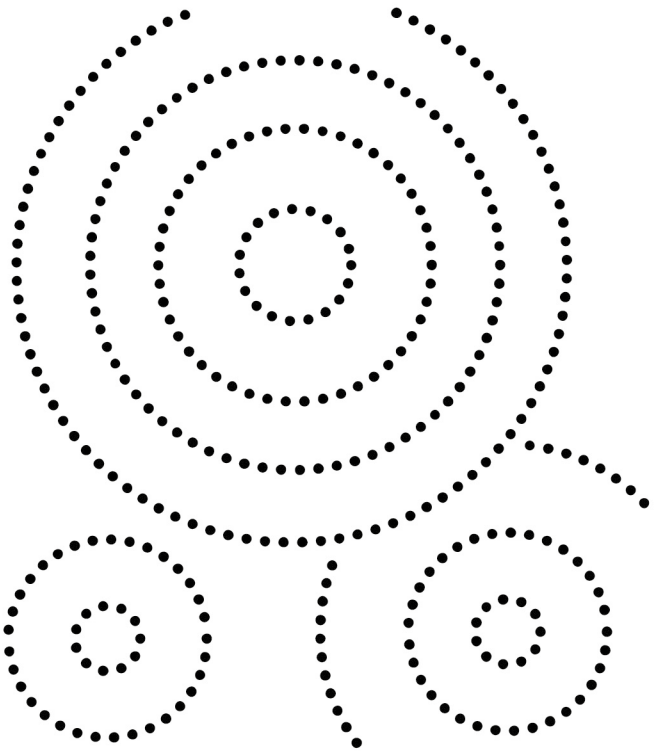
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



A noite, as auras, a lua,
rouxinóis a gorjear,
me inspiraram sentimentos,
que não tive a quem narrar.

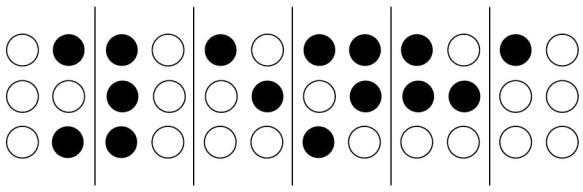


A B C D E F G H I J K L M N O P Q R S T U

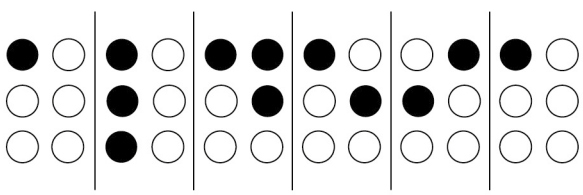
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

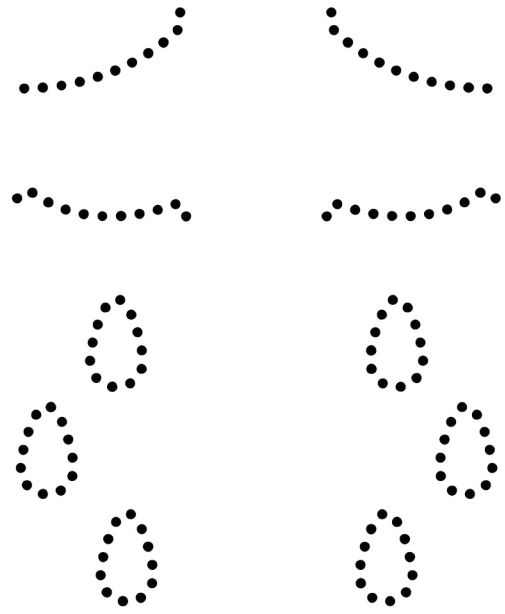
Lenha



aldeia



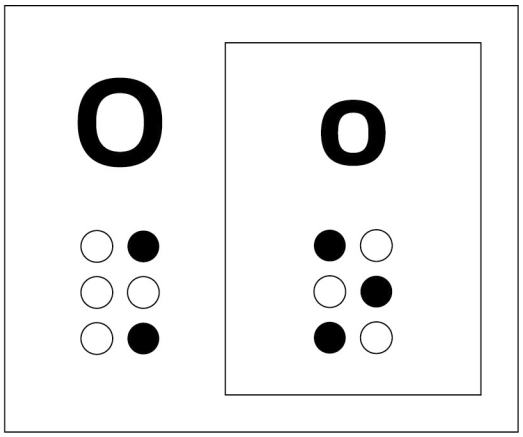
Então, com o pranto nos olhos,
no coração a tristeza,
«? Que faz a flor no deserto ?»
perguntei à natureza.



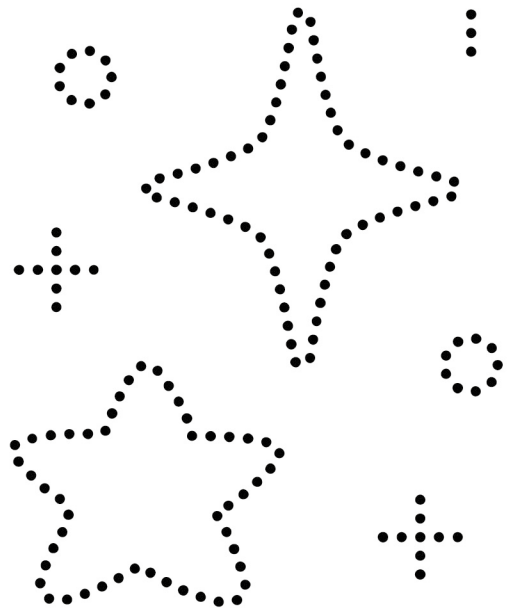
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



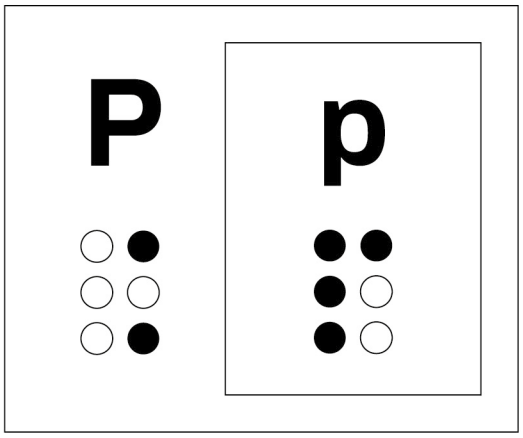
«? Que faz um astro brilhando
«a paiz deshabitado?
«? Que presta um cabeço fertil
«no meio do mar salgado?



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



.:⁘·

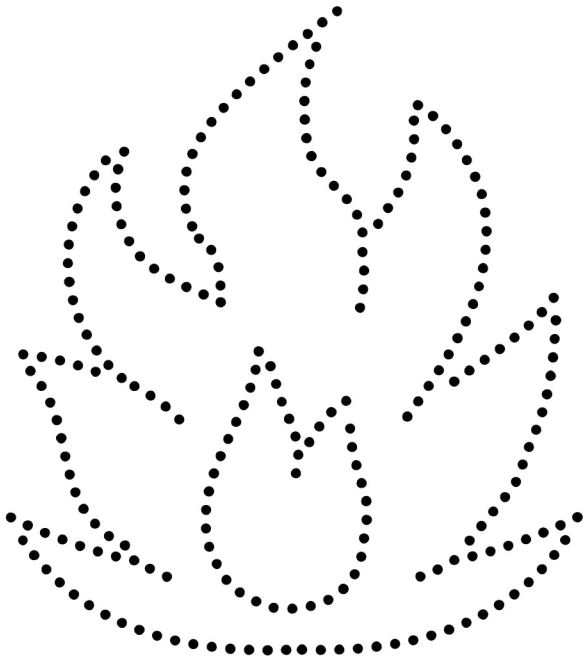
«? Porque me fazes num vago
«inutil fogo abrazar,
«se não acho n’este mundo
«uma só que eu deva amar ?!»

⁘· ⁖⁘⁘⁘⁘⁖· ⁘· ⁘· ⁘·⁘· ⁘⁖⁘ ⁘· ⁘⁘

⁘·⁘⁘⁘⁘·⁘· ⁘⁘⁘⁘ · ⁘ ⁘· ⁘· ⁘·

⁘⁘· ⁘⁘⁘ · ⁘⁘⁘ ⁘⁘ ·⁘⁘⁘· ⁘⁘⁘⁘⁘

⁘⁘⁘· ⁘⁘ ⁘⁘· ·⁘⁘ ⁘⁘⁘· · ⁘· ⁘ ·⁘⁘⁘

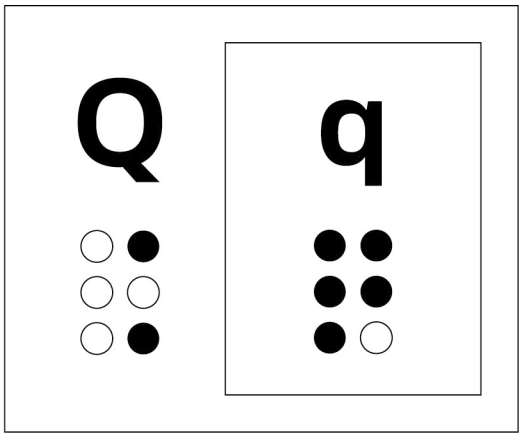


⁘⁘ ⁘·⁘⁘⁘· · ⁘⁘⁘ · ⁘⁘⁘ · ⁘⁘⁘⁘⁘ ·⁘

A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

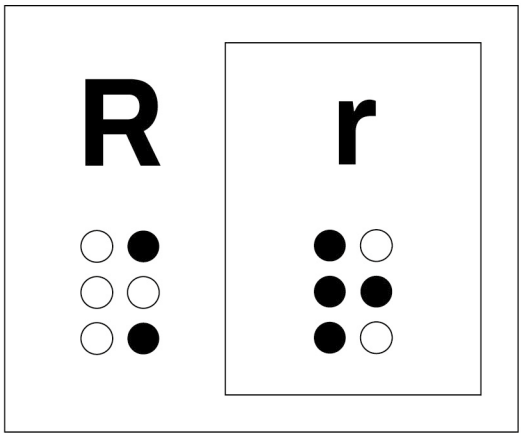


E eu voei com o pensamento,
qual relâmpago ligeiro,
aos muros silenciosos
de solitário mosteiro.

A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

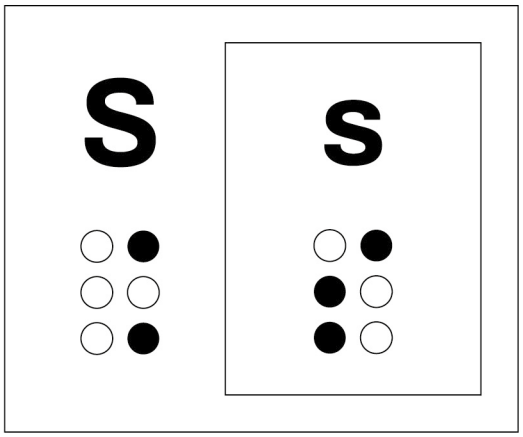


Melancôlico e silvestre
era todo esse lugar:
de um lado, montanhas ermas!
do outro, pinhais, e o mar!

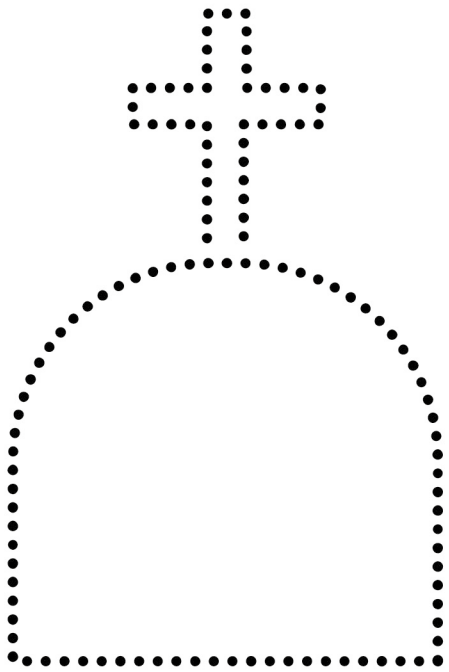
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



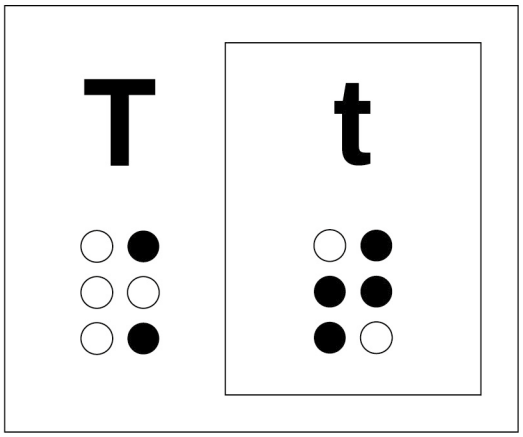
E eu entrei ao mesmo tempo
no fundo do santuário;
das campas o surdo estrondo
movi com pé temerário!



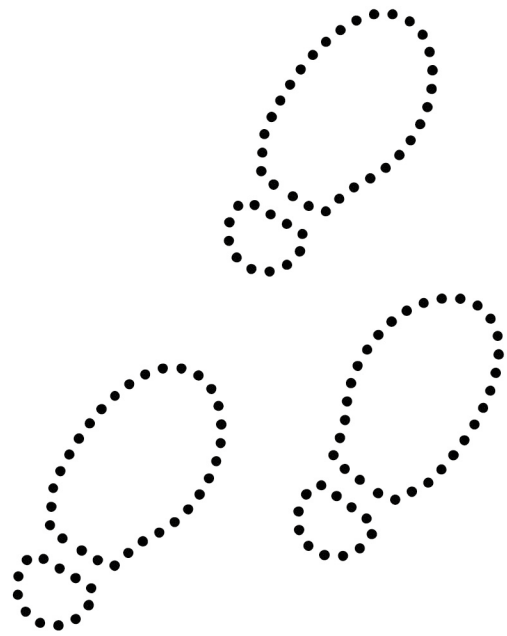
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



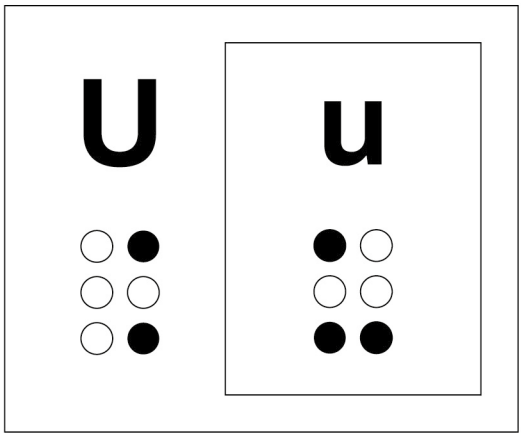
Por toda a parte achei noite,
e o silêncio mais profundo:
nenhuma voz! nenhum passo!
nenhum dos filhos do mundo!



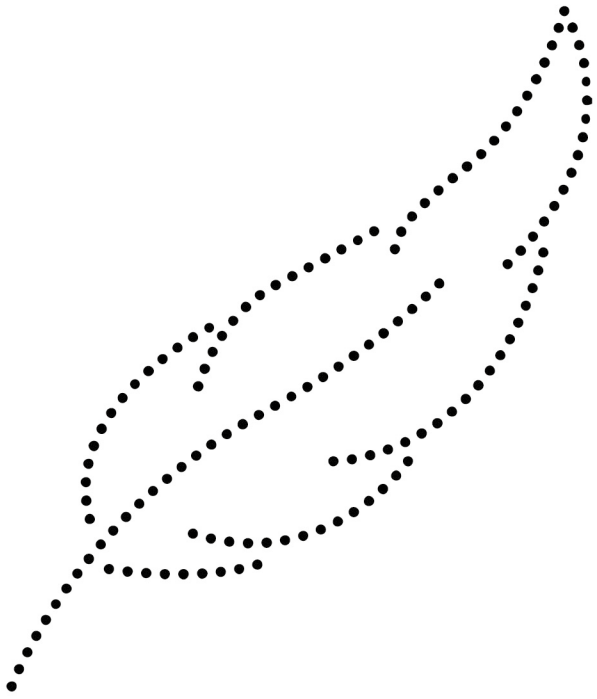
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



Só do mocho sobre o tecto
o triste piar se ouvia,
que pela abóbada extensa
se alongava, e se perdia.

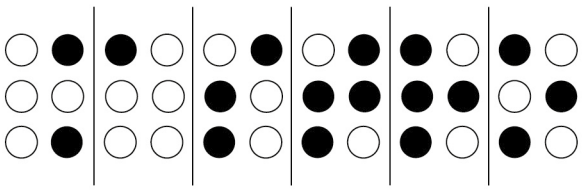


A B C D E F G H I J K L M N O P Q R S T U

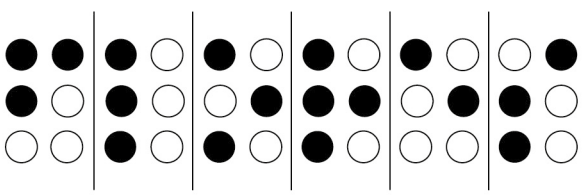
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

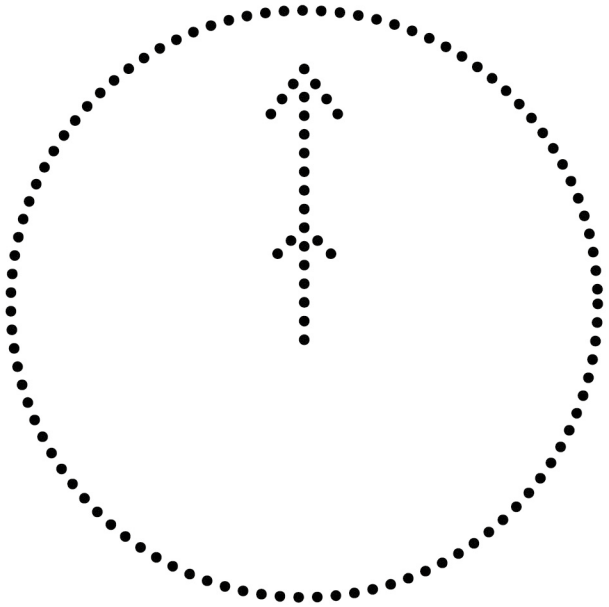
Astro



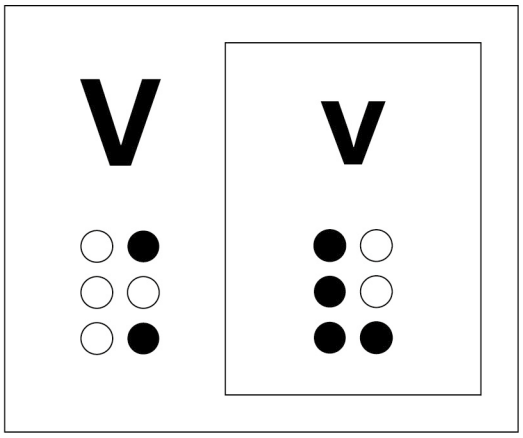
flores



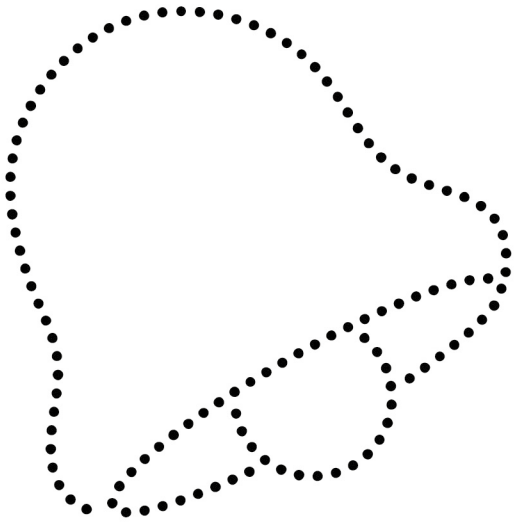
Logo o relógio da torre
meia noite fez ouvir;
do templo os echos acordam,
e tornam logo a dormir.



A B C D E F G H I J K L M N O P Q R S T U
•
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â
É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



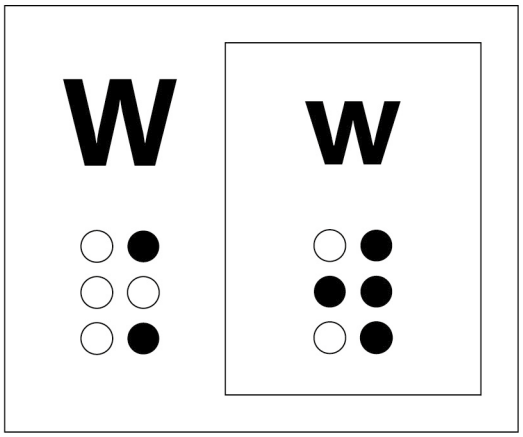
Depois um sino, tocado
por forte invisível mão,
chamou triste os pensamentos
para a nocturna oração.



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

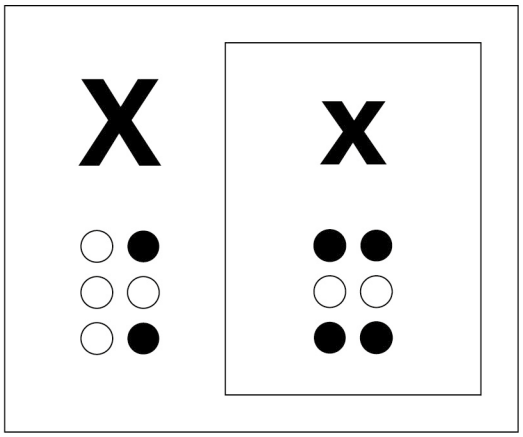


Do côro, até ali deserto,
foram cheios os lugares;
no ar, até ali calado,
reinaram ternos cantares.

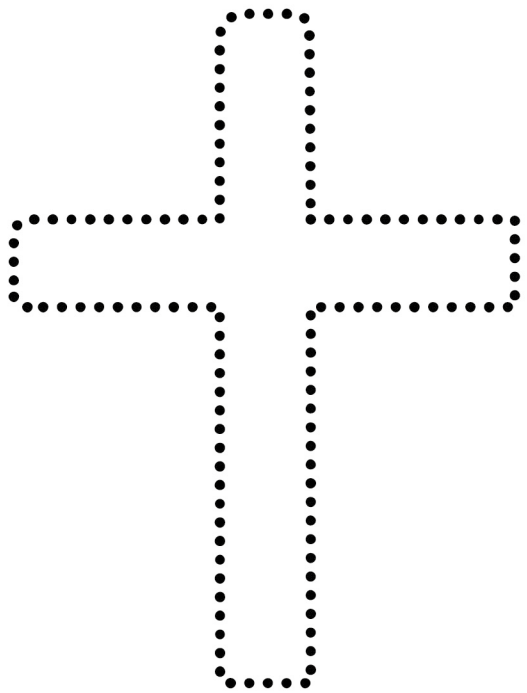
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



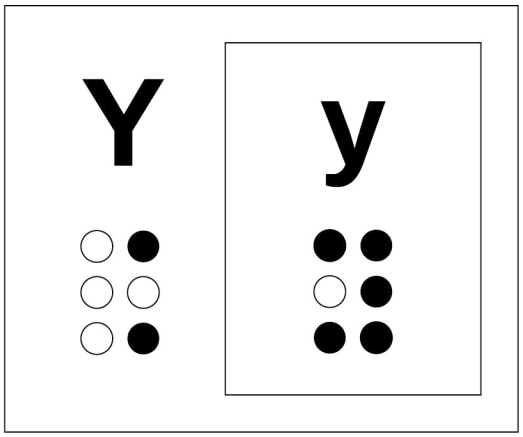
A hora, o lugar, as trevas,
e aquelas vozes suaves,
reuniram na minha alma
há ternura ideias graves.



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

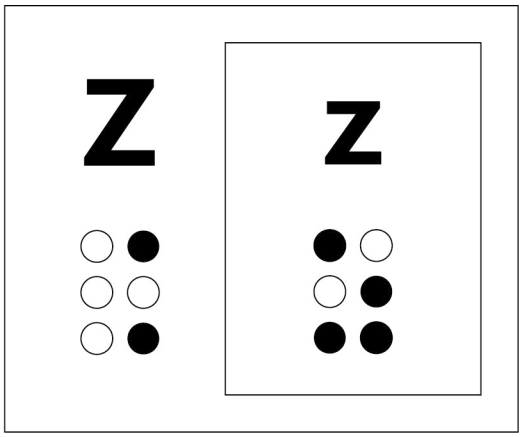


Ao tronco de uma coluna
pensativo me encostei.
Muito mais triste que antes,
e muito mais só me achei.

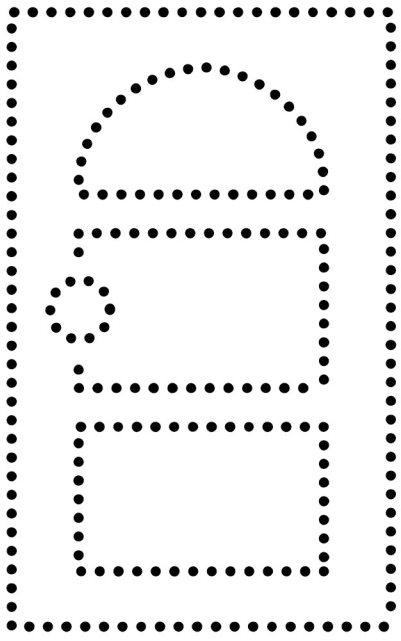
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Ż Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

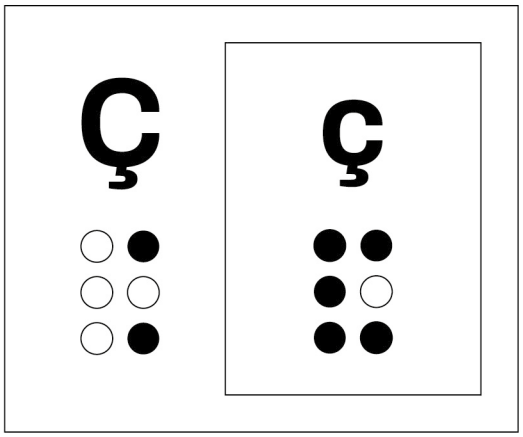
É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



Emudeceu todo o côro;
eis as luzes se retiram;
bateu a porta ao fechar-se;
as santas irmãs saíram.



A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



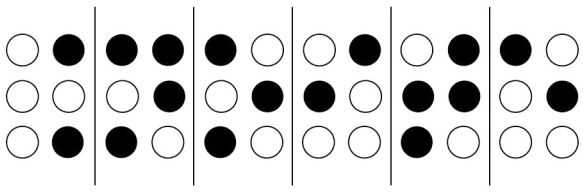
Da lampada veladora
o lume, já quase extinto,
de mil trémulos fantasmas
encheu do templo o recinto.

A B C D E F G H I J K L M N O P Q R S T U

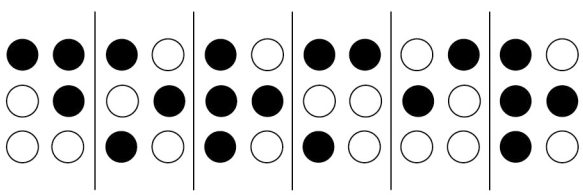
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

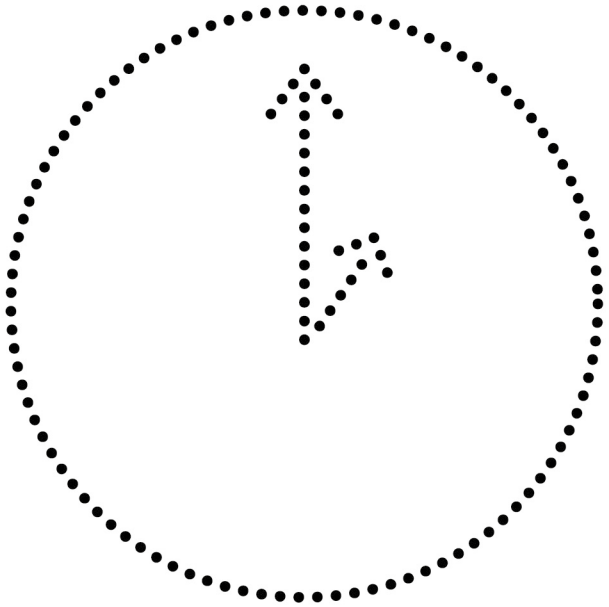
Noite



dormir



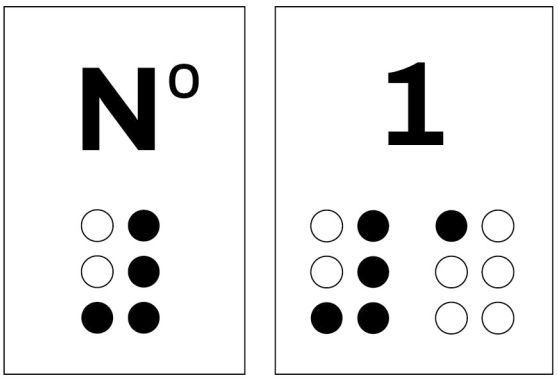
Logo o relógio da torre
uma hora fez ouvir;
do templo os echos acordam,
e tornam logo a dormir.



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

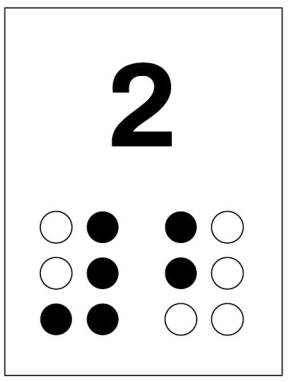


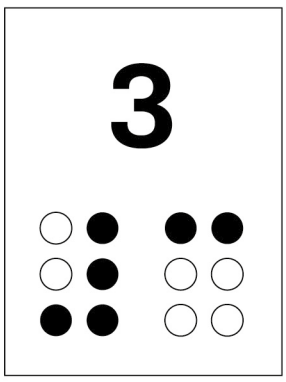
Afastei-me horrorizado,
e veloz nesse momento
ao dormitorio tranquillo
me arrojei com o pensamento,

A B C D E F G H I J K L M N O P Q R S T U

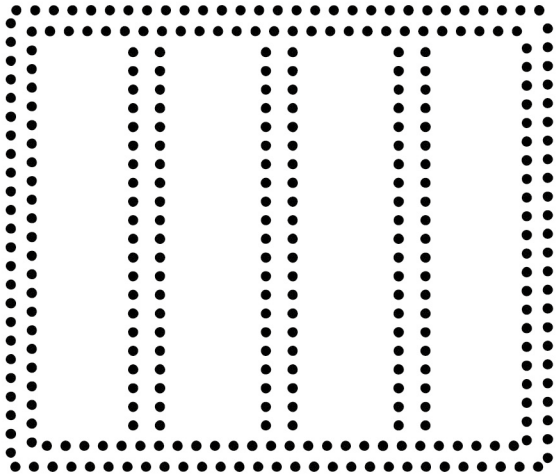
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »





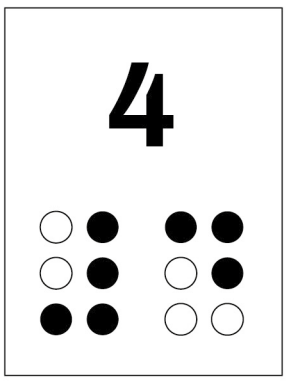
Mão na face, e olhos na lua,
vi, dentro de escura cela,
chorosa virgem, sentada
às grades de alta janela.

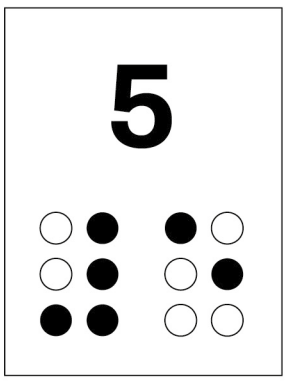


A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



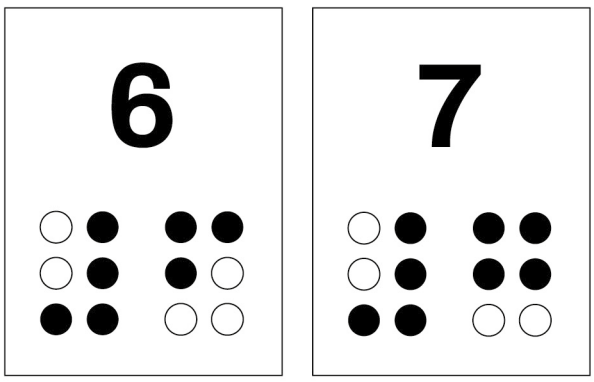


Conheci por seus cabelos,
e seus trajes seculares,
que não era das votadas
eternamente aos altares.

A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

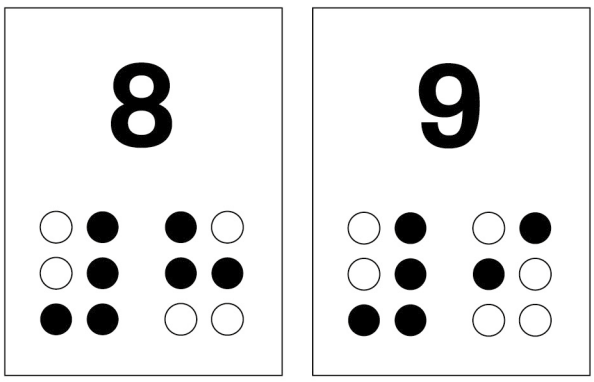


Conheci que um pensamento
nutria triste, e profundo;
e eu disse: «Qual eu me vejo,
«se vê sozinha no mundo !»

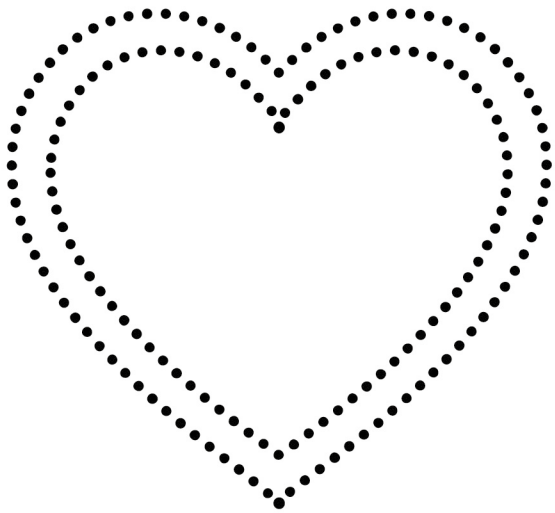
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



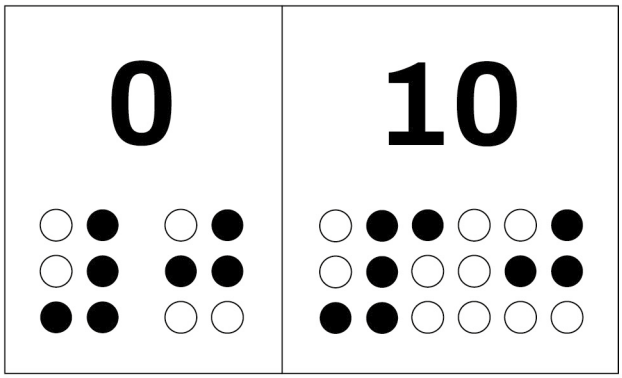
E todos quantos afetos
sua alma encerrados tinha,
num profetico delirio
foram presentes à minha.



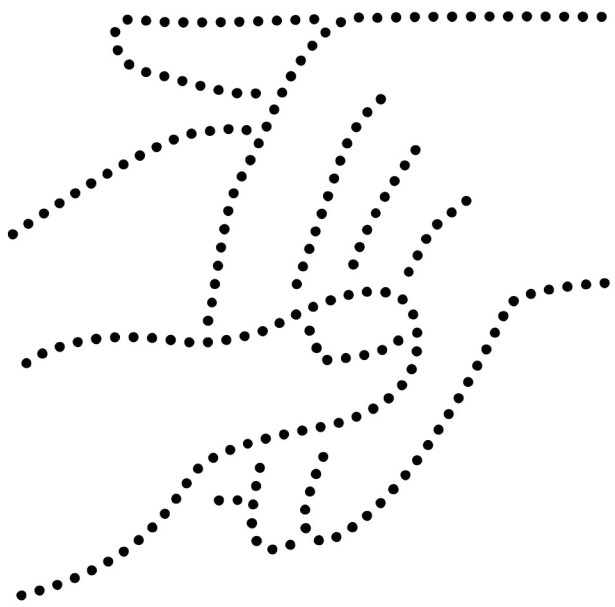
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



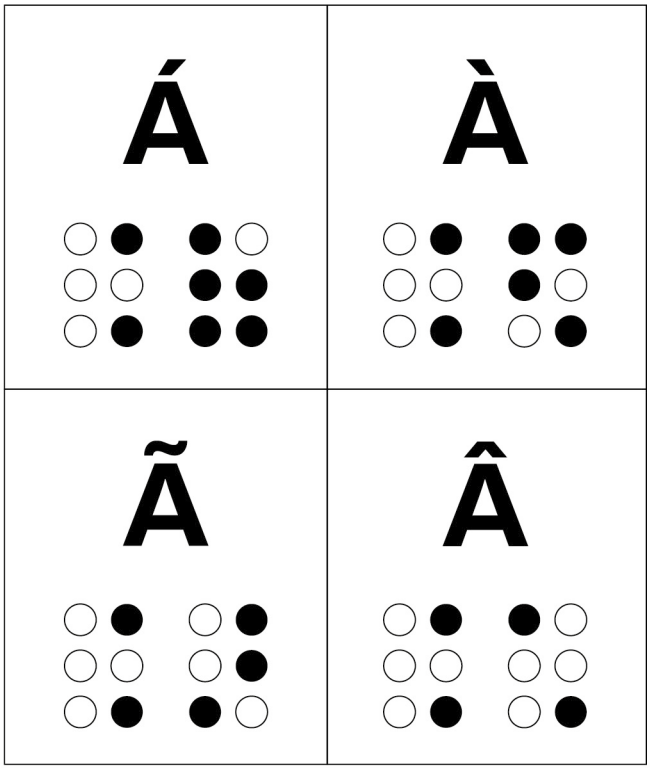
Apertei-lhe a mão com força;
e chegando-a ao coração,
«Ambos achámos» — lhe disse —
«o que buscamos em vão.



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



⠒⠭⠄

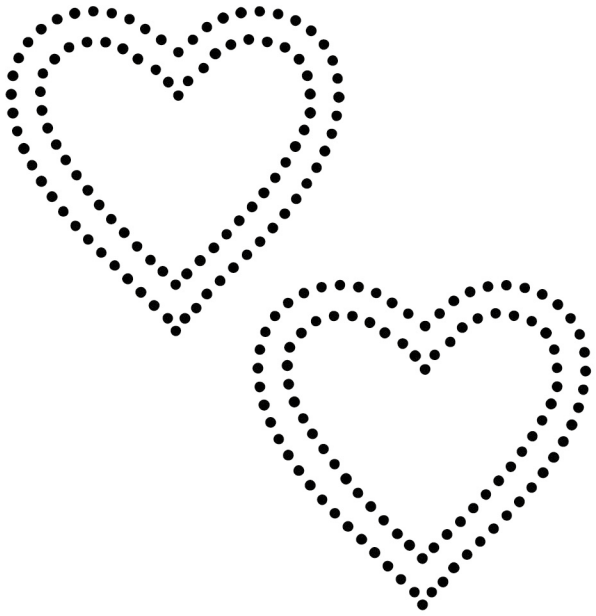
«Por este céu me protesta,
«que eu juro por este céu,
«tu, ser minha eternamente;
«eu, ser para sempre teu.»

⠠ ⠒⠭⠒⠠ ⠄⠒⠤⠄ ⠶⠿⠠ ⠒⠄ ⠒⠠⠒⠤⠄⠒⠤⠄ ⠂

⠠⠿⠠⠄ ⠄⠠ ⠤⠠⠒⠠ ⠒⠒⠠ ⠄⠒⠤⠄ ⠶⠿⠠⠂

⠠⠿⠠⠂ ⠤⠄⠠ ⠒⠤⠣⠠ ⠄⠤⠠⠒⠤ ⠒⠤⠣⠠⠄⠠

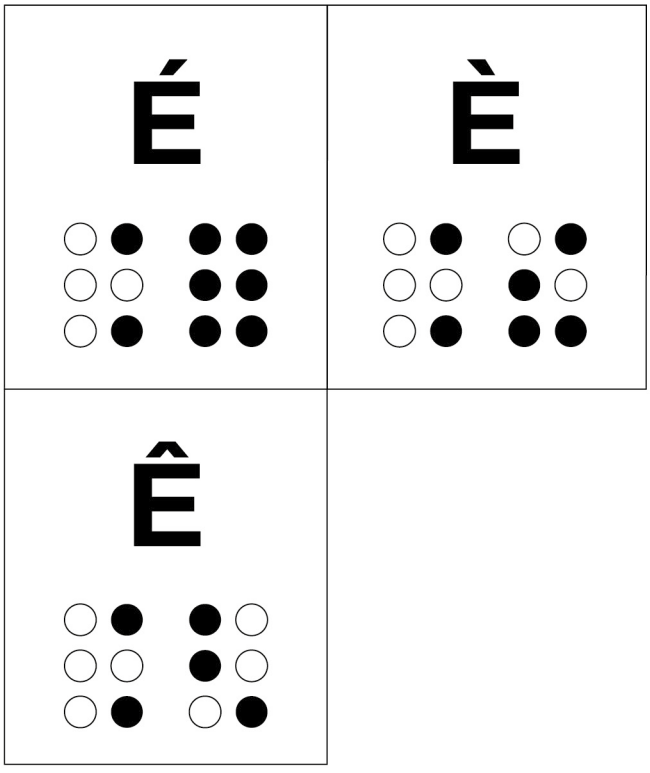
⠠⠄⠠⠂ ⠤⠄⠠ ⠒⠂ ⠒⠂ ⠤⠄⠶⠒⠠⠄ ⠤⠄⠠⠂ ⠤⠠



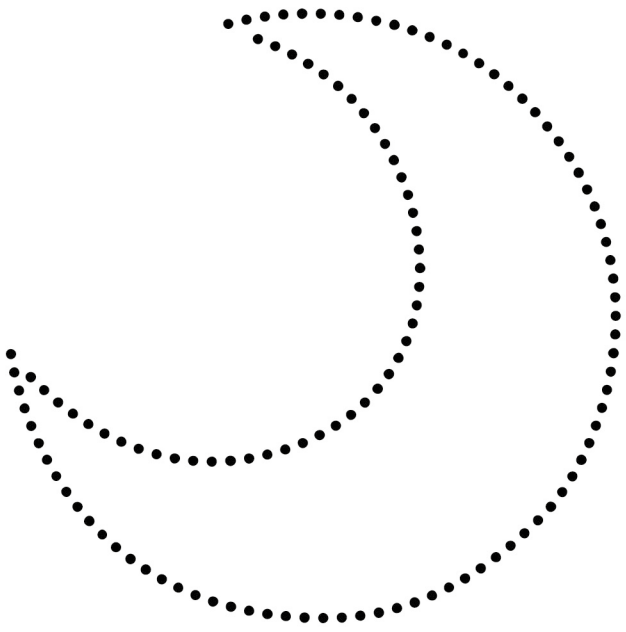
⠐⠒ ⠠⠄⠤⠤⠠⠂ ⠂⠶⠒ ⠄ ⠶⠄⠂ ⠒⠶⠤⠒⠠⠂ ⠄⠄

A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â
• • •
É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



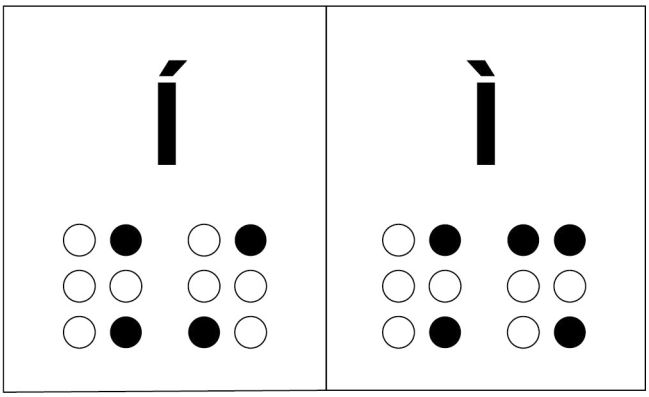
O céu ouviu nossos votos;
viu-nos a lua abraçar;
e ambos juntos assentados
ficámos a conversar.



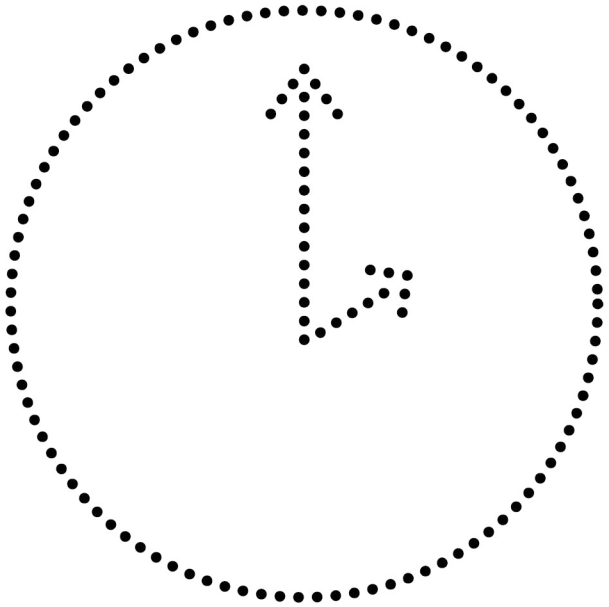
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



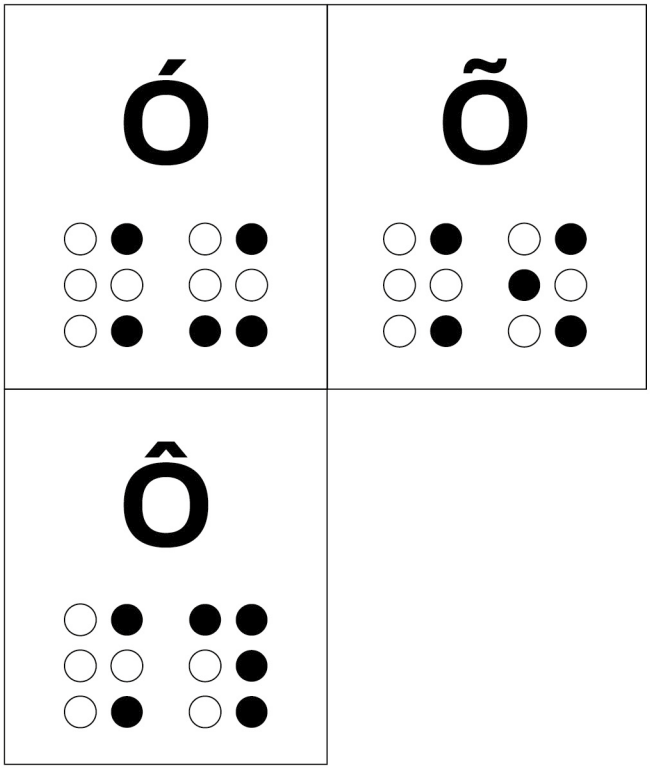
Logo o relógio da torre
duas horas fez ouvir;
os ecos de novo acordam,
e tornam logo a dormir.



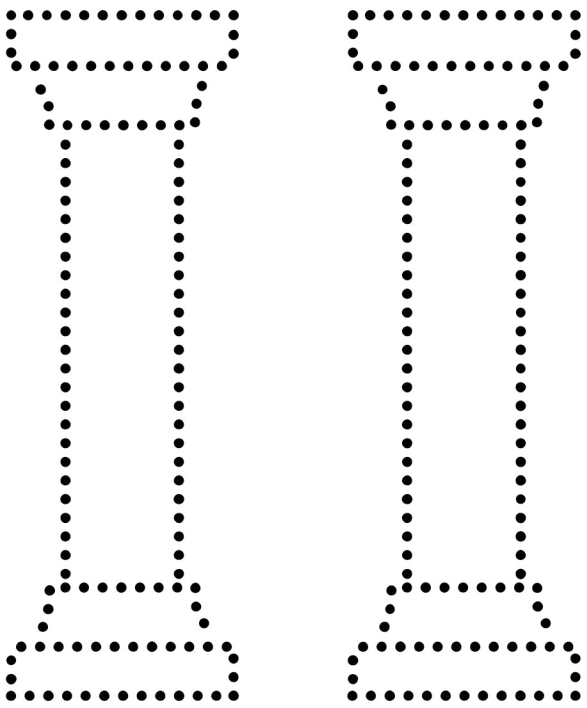
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



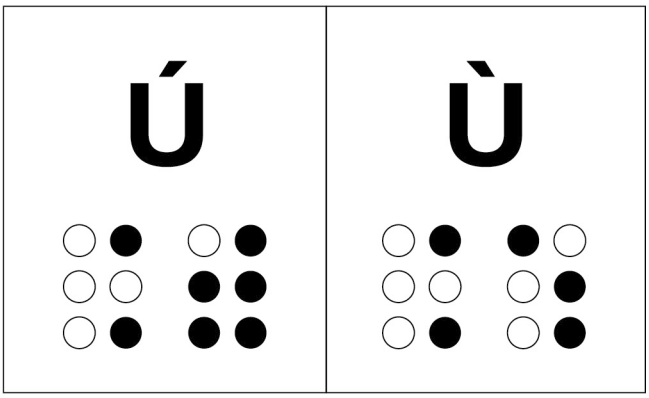
Mas esta virgem quem era
porque entrou na solidão?
de onde o seu ar pensativo?
de onde a interna agitação?



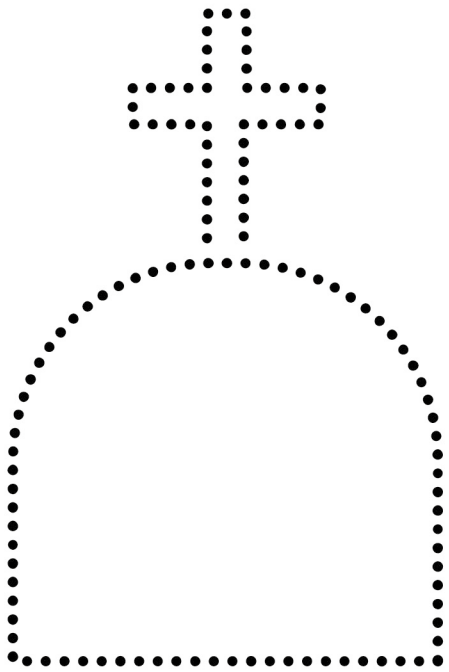
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



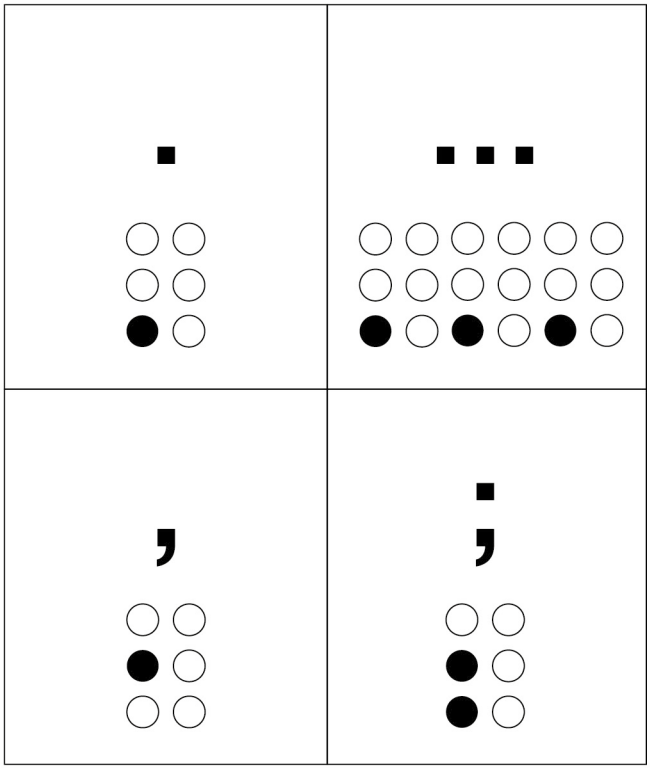
Alta noite!.. ela sozinha!..
porque razão não tremeu?
ao mortal desconhecido
como subito se deu!



A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



Onde existe esse mosteiro,
esse encantado lugar?
de um lado, montanhas ermas!
do outro, pinhais, e o mar!

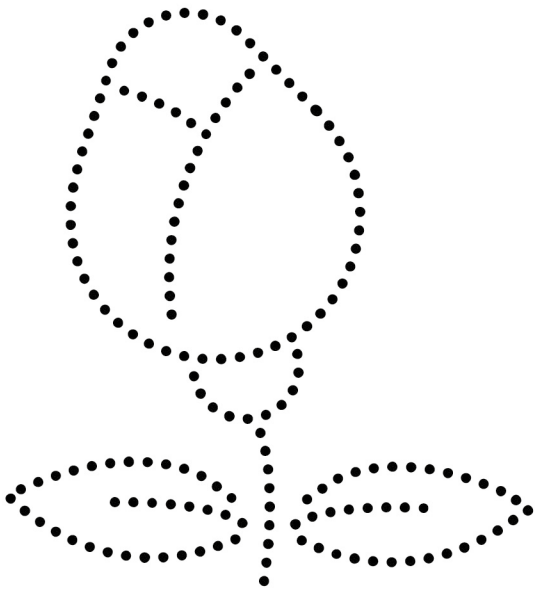
A B C D E F G H I J K L M N O P Q R S T U

V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »

!	?
:	’

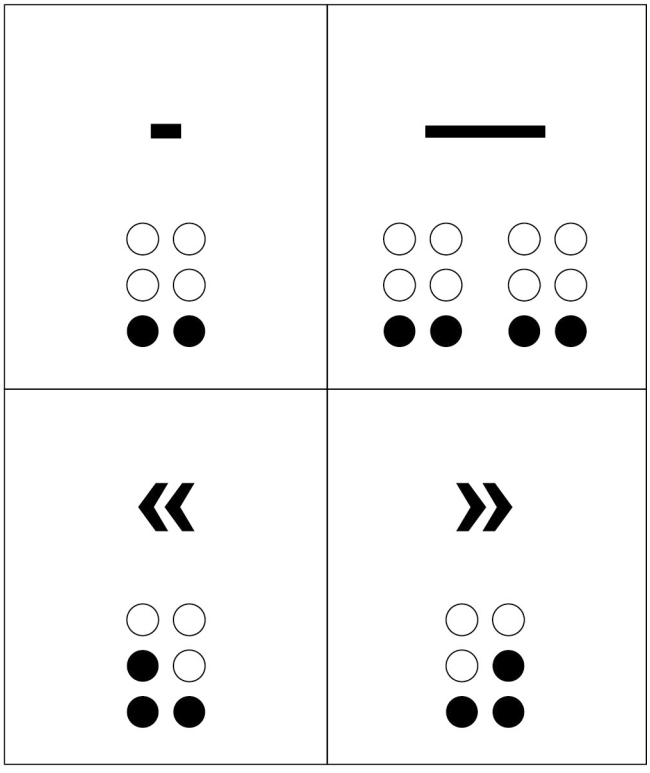
Homens, deixarei meu segredo;
Basta saber que eu sou dela,
seja onde for seu retiro,
seja quem for esta bela.



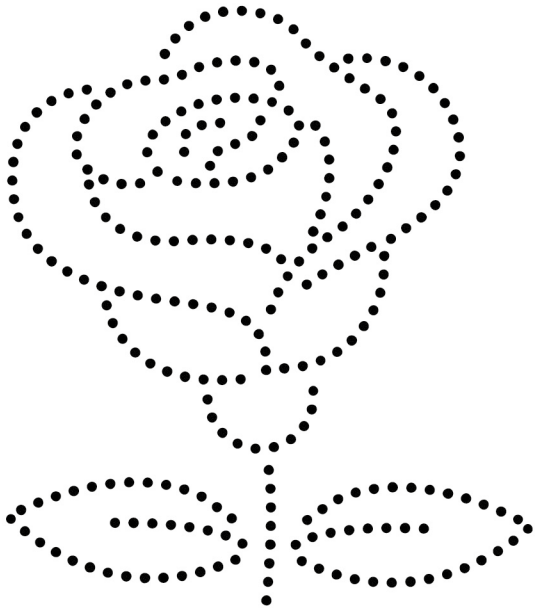
A B C D E F G H I J K L M N O P Q R S T U

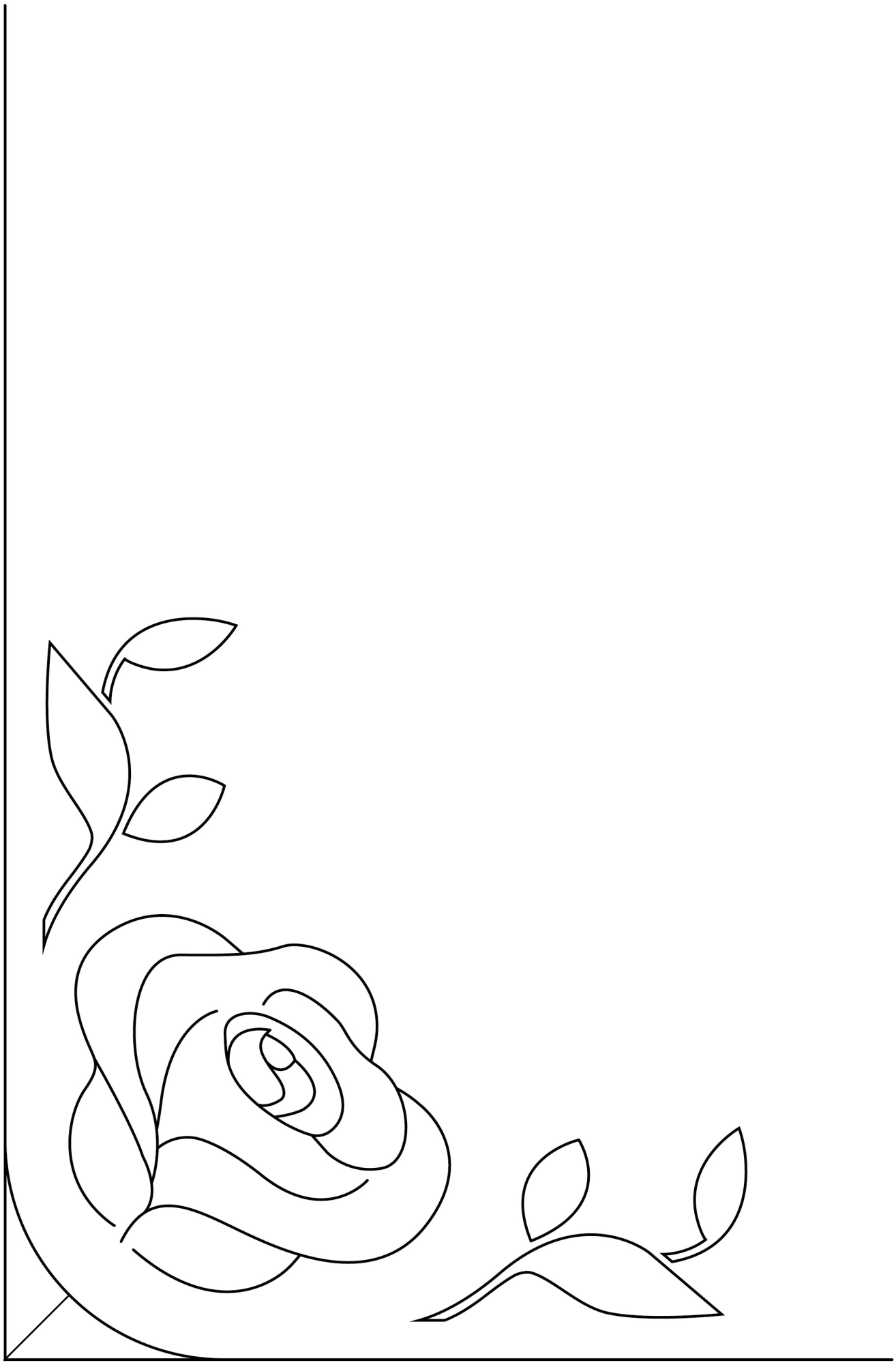
V W X Y Z Ç 1 2 3 4 5 6 7 8 9 0 Á À Ã Â

É È Ê Í Ì Ó Õ Ô Ú Ù . … , ; ! ? : ‘ - — « »



Mulheres, este fantasma
vos exede nos encantos,
Serão dele eternamente
o meu amor e os meus cantos.





U.PORTO
FACULDADE DE BELAS ARTES
UNIVERSIDADE DO PORTO

APPENDIX

MASTER IN GRAPHIC DESIGN AND EDITORIAL PROJECTS

INVISIBLE BOOKS:
THE WORLD OF INVISIBLE DESIGN

Book Analysis: "LER É CRESCER", Educational Book

MARIANA DA SILVA COUTO

© SANTA CASA MISERICÓRDIA PORTO.
LER É CRESCER: LEIO SOZINHO NÍVEL 1. JUNE 2010.

INDEX

1. BOOK INTRODUCTION 258

2. DESCRIPTION 262

3. DISPLAY & PAGES 264

4. WRITTEN TEXT 266

5. ILLUSTRATIONS 268

6. INDEX & END PAGES 270

7. PROS & CONS 272/73

8. CONCLUSION 273

1. BOOK INTRODUCTION

Original PT Title: Ler é Crescer: Leio Sozinho Nível 1–Adaptação Braille—O Patinho Feio, A Panela Mágica, Os Três Ursos, A Galinha Ruiva, O Nabo Gigante.

ENG Title: Reading is Growing: I Read Alone Level 1—Braille Adaptation—The Ugly Duckling, The Magic Pot, The Three Bears, The Little Red Hen, The Giant Turnip.

Santa Casa Misericórdia Porto/Centro Professor Albuquerque e Castro – Rua de Costa Cabral nº 606/612 – 4200-227 Porto

Main Demographic:
Children (6-10 years) & Parents and/or Caregivers

Printing & Binding:
Printed with Colours and Embossed (Single sided Braille)*
Wire Binding/Wire-O (3:1 pitch)

Page nº: 72 Pages (A4 Paper)

IDENTIFYING MARKS*

Embossed Page (Braille/Relief)

Back/Blank Page (Negative Relief)

Basic Criteria	Creator/Publisher	Release Date	Language
Educational Book, Book in Braille	CPAC—Santa Casa Misericórdia Porto	June 2010	Portuguese

Classification	Book Genre	Transcription/ Design/Illustration	Revision
Children and Young Adults Stories	Fables and Narratives	Ana Rothes	António Santos

ISBN	EAN	Online Reseller	Price + Shipping
5600000001543	5600000001543	Wook.pt	10,69 €

LER É CRESCER:

Leio Sozinho

Contos clássicos infantis
escritos numa linguagem
simples para crianças que
estão a aprender a ler

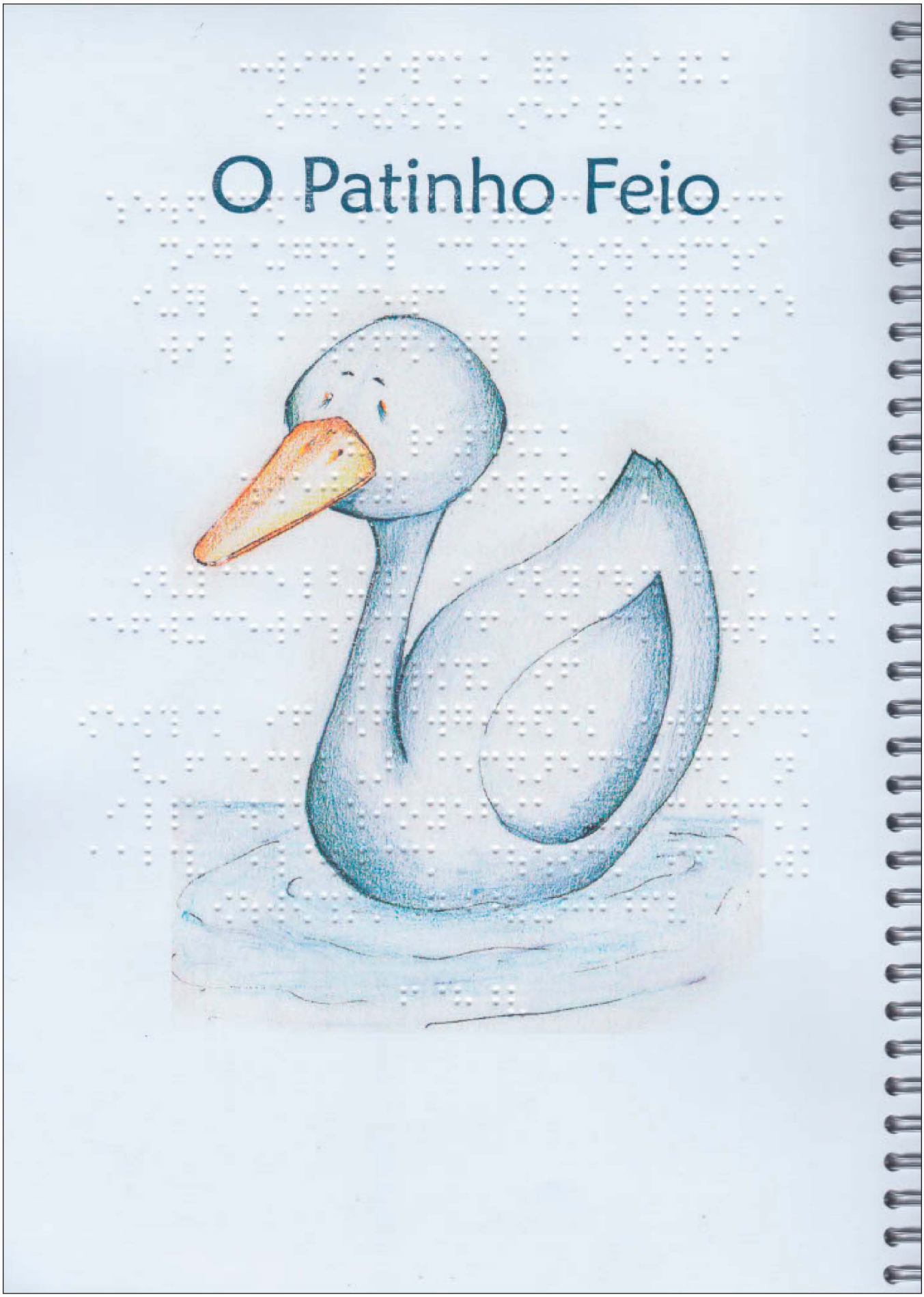
NÍVEL 1

Adaptação e Publicação

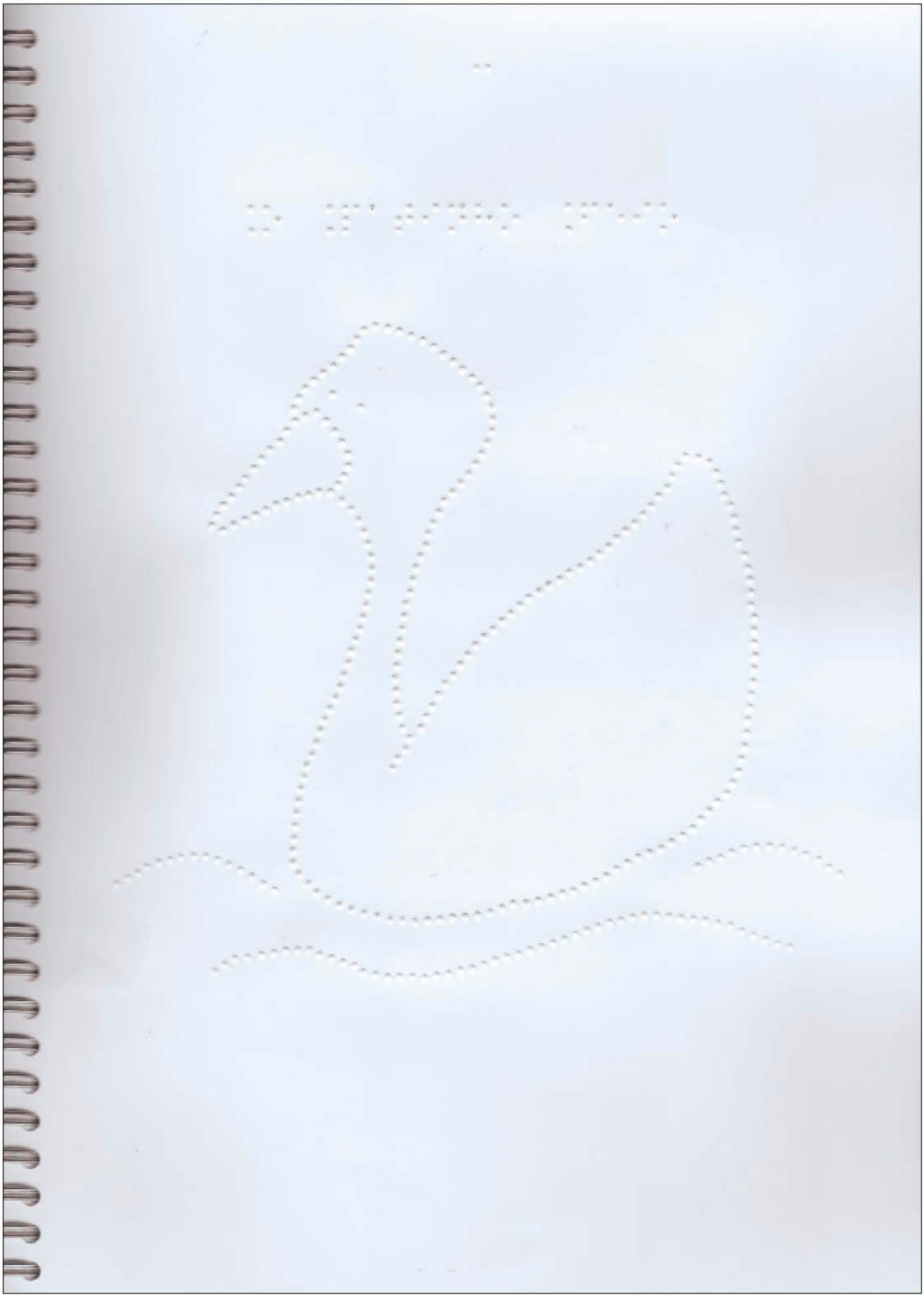
MISERICÓRDIA DO PORTO

Centro Professor Albuquerque e Castro

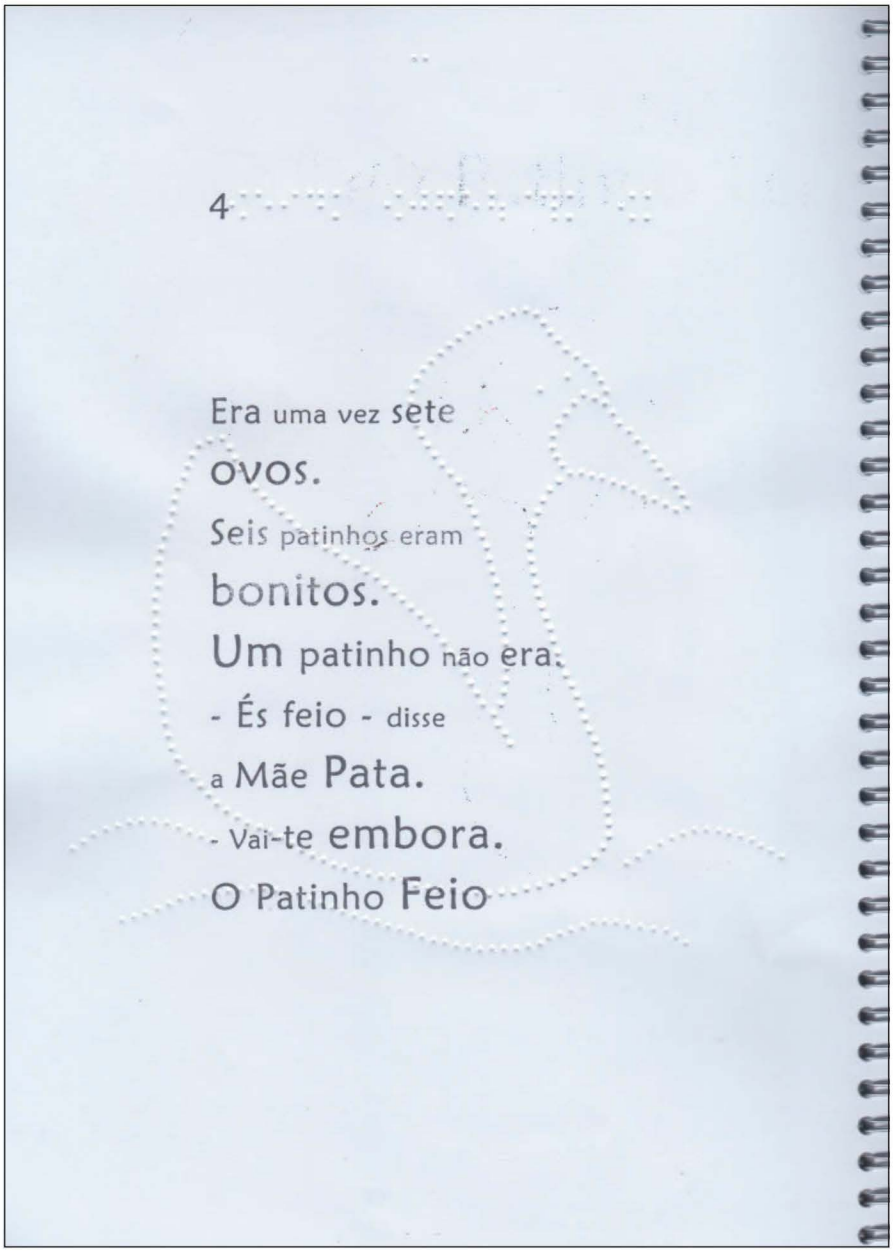
1. Book Cover "LER É CRESCER"
Santa Casa Misericórdia Porto



2. Illustrated Title "The Ugly Duckling"
Santa Casa Misericórdia Porto



3. Braille Title "The Ugly Duckling"
Santa Casa Misericórdia Porto



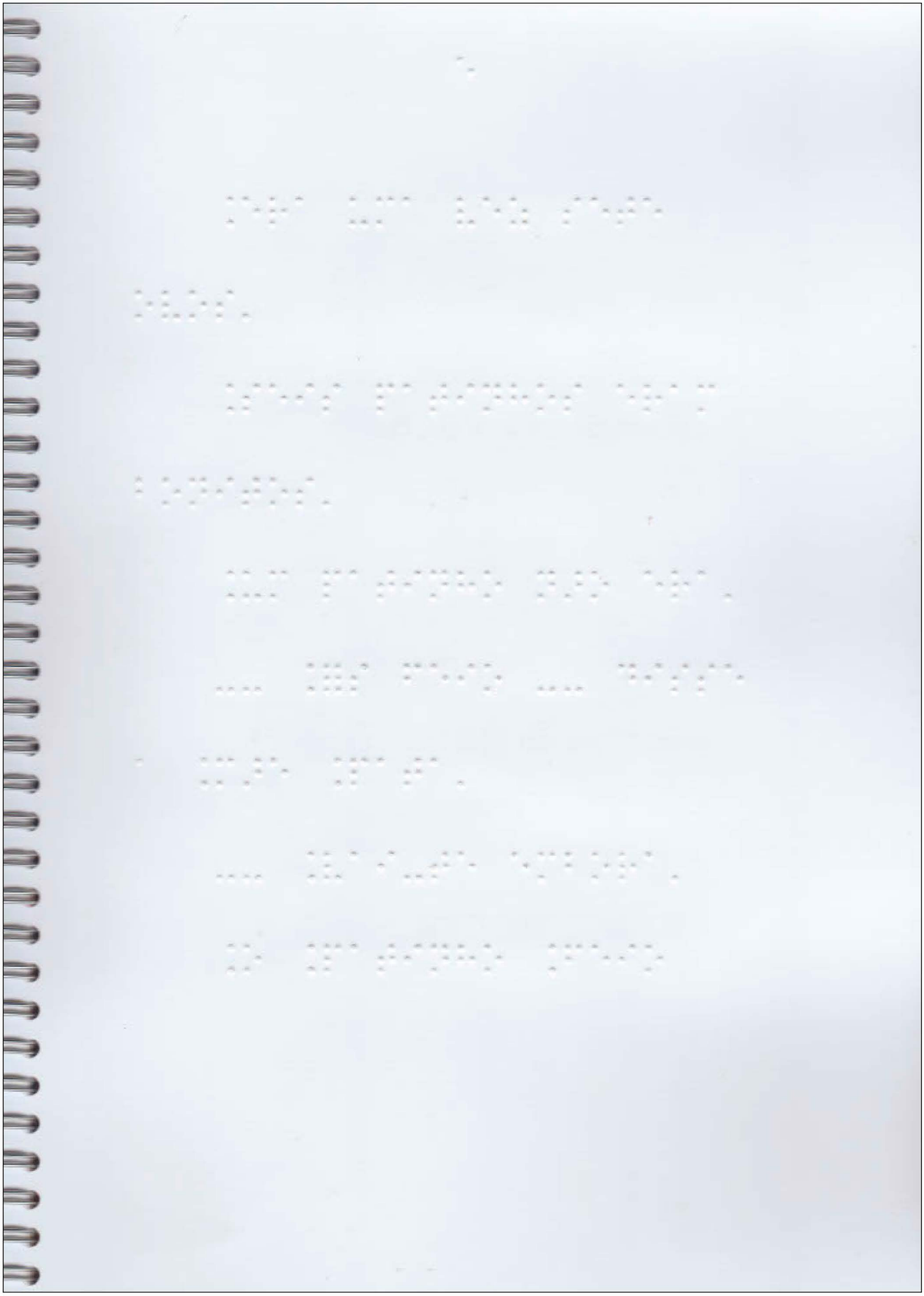
4. Page Example 1 "The Ugly Duckling"
Santa Casa Misericórdia Porto

2. DESCRIPTION

"Ler é Crescer" is a book for teaching kids to identify and read Braille. The book, as many others for this purpose, uses short stories and sentences to teach kids important words and phrases without being too complicated or formal.

The book is structured so the right page always has Braille text or illustrations, while the left page has ink printed text to take unused space from the back of the braille right pages. The left page is primarily for parents or caregivers to accompany reading, but also for individuals with low vision that might be starting to learn without knowing where to start (Visual aid).

EXAMPLE 1:
Written page with is mirrored page in Braille. Both contain the same text and punctuation in its respective formatting.



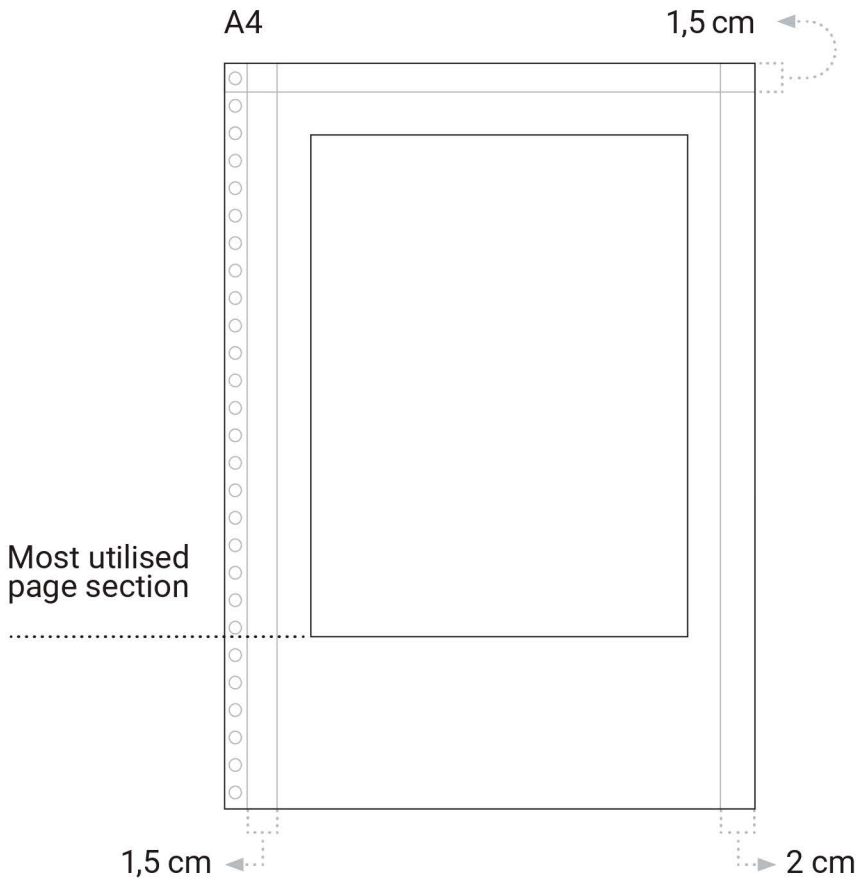
5. Braille Example 1 "The Ugly Duckling"
Santa Casa Misericórdia Porto

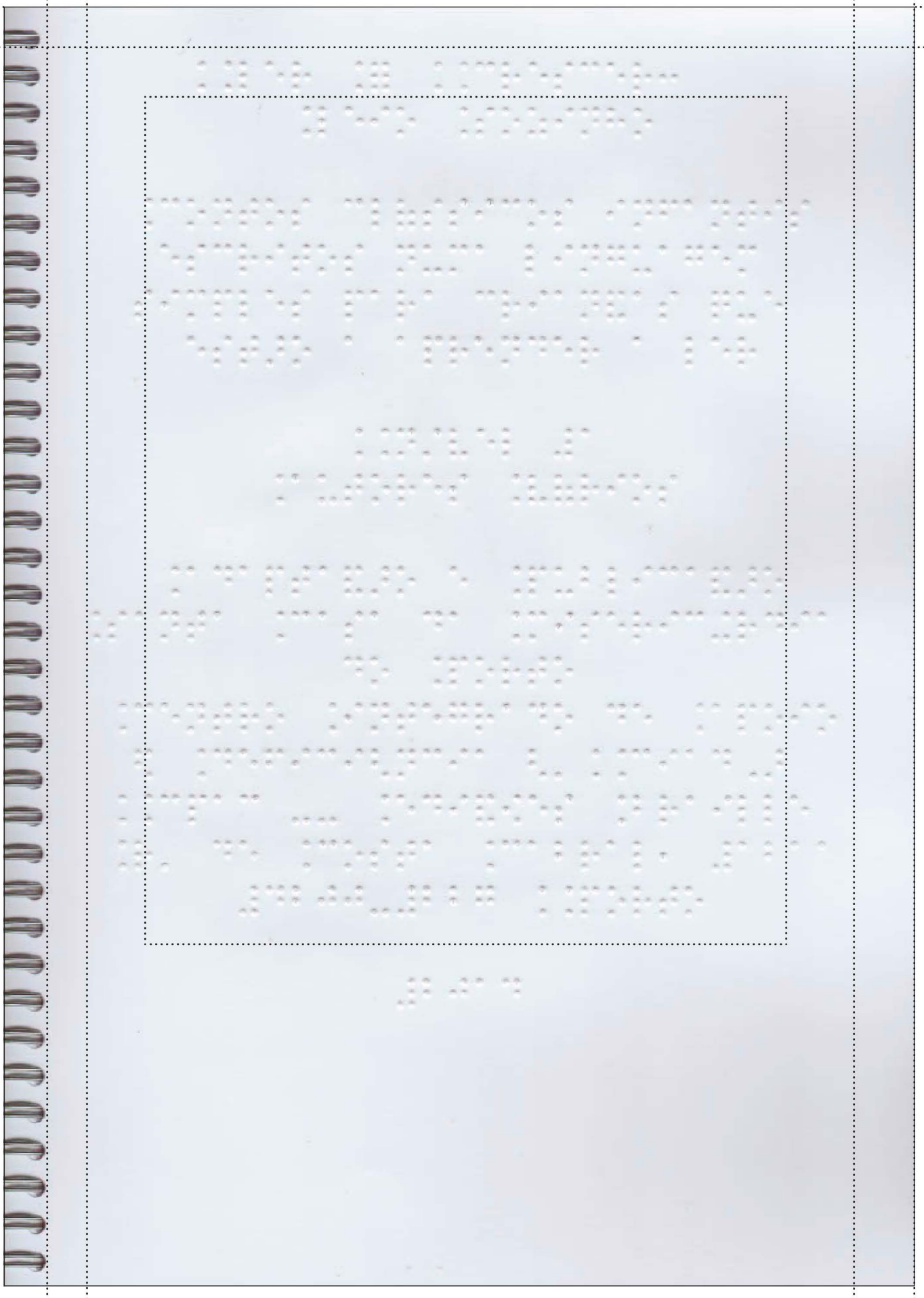
3. DISPLAY & PAGES

The book is A4-sized, front and back cover made from slightly cream-coloured paper with approximately 150 gr, the body of the book is white paper with an also estimated grammage of 120. The binding is done using wire binding with a 3:1 pitch, ensuring there's not much pressure between the pages so the Braille can last longer, be more flexible and not as heavy.

The layout of the pages is designed to accommodate Braille readers. There is a blank space of 1,5 cm above the pages with Braille so that readers can find the words immediately. The margins include a 1,5 cm space on the inside and 2 cm on the outer edge, with varied space below depending on the content of each page, and with no bigger spacement than two lines between lines of text.

The book was created in 2010, before Braille was officially updated in Portugal (2017), using the official system and rules of 1930. Each page is marked at the top for easy navigation, and certain words are highlighted by their extra size to draw attention to key content in the printed ink text.





4. WRITTEN TEXT

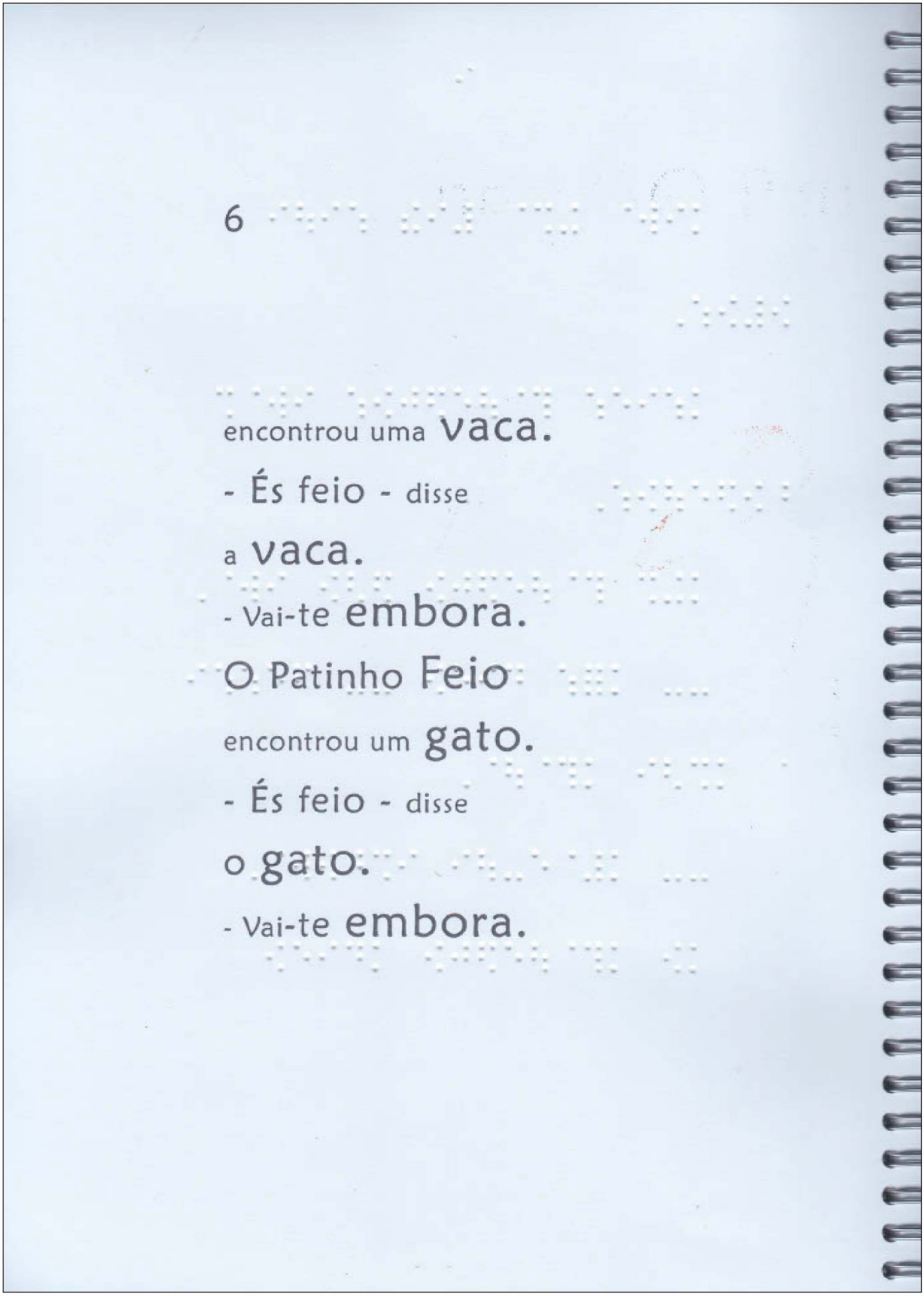
The written text, like the Braille, is centred in the page, occupying its parallel negative area. It's structured so it corresponds exactly to the Braille on the page next to it and takes the same number of lines and punctuation as its mirror page.

Words have 0,5cm of height while highlighted words have 1cm.

There's no Italics, bolds or annotations anywhere, information being self contained to their own pages. The only exception to the rule being the Editorial, that its separate, but presents all information as the rest of the book is structured, with the same breaking points and paragraphs.

The printing seems to have been made on 2 separate occasions, inked words being printed first while braille was done after. This is observed in places where ink and braille intertwine and overlap.

7. Illustrated Title "The Three Bears"
Santa Casa Misericórdia Porto



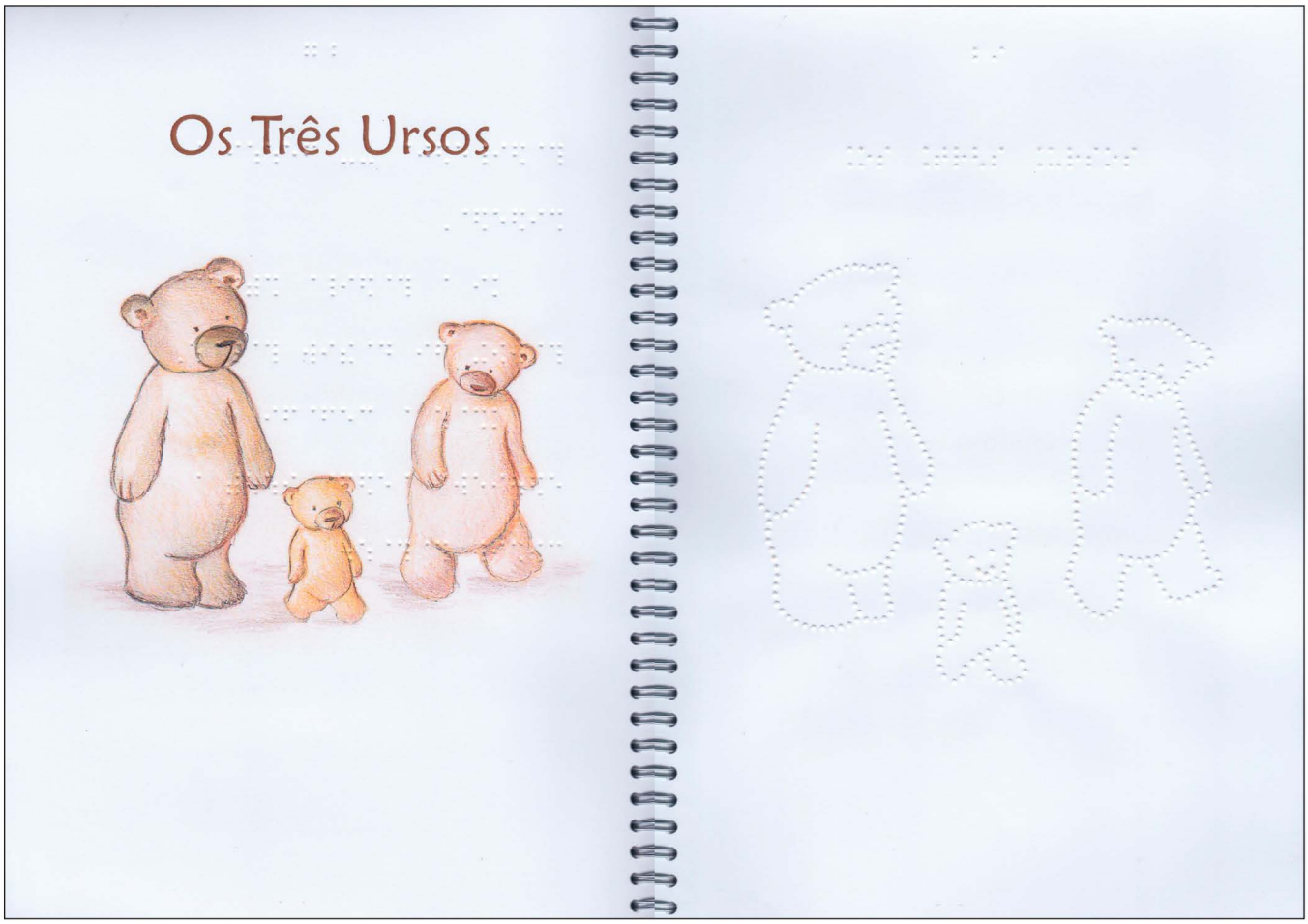
8. Braille Example 2 "The Ugly Duckling"
Santa Casa Misericórdia Porto

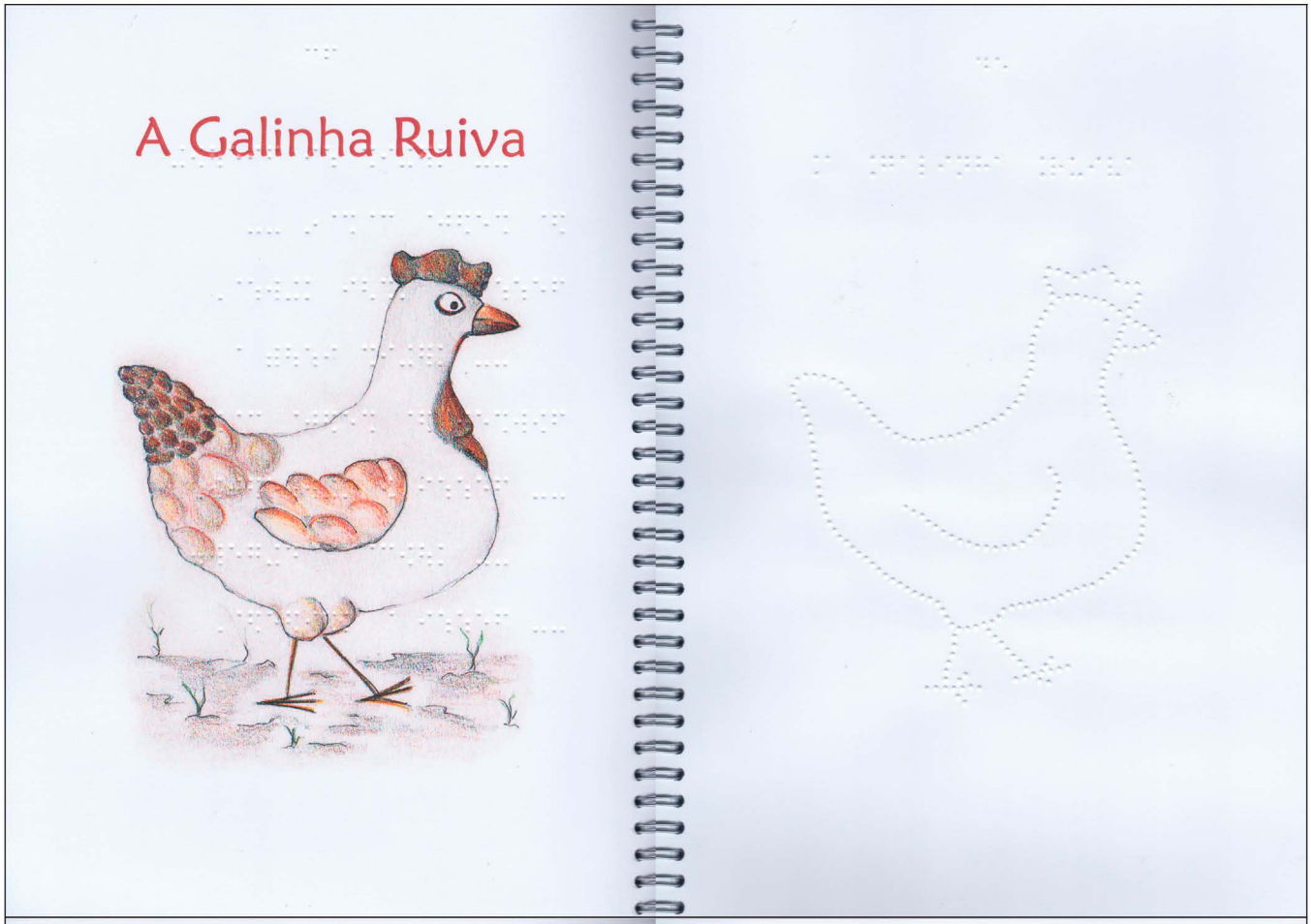
5. ILLUSTRATIONS

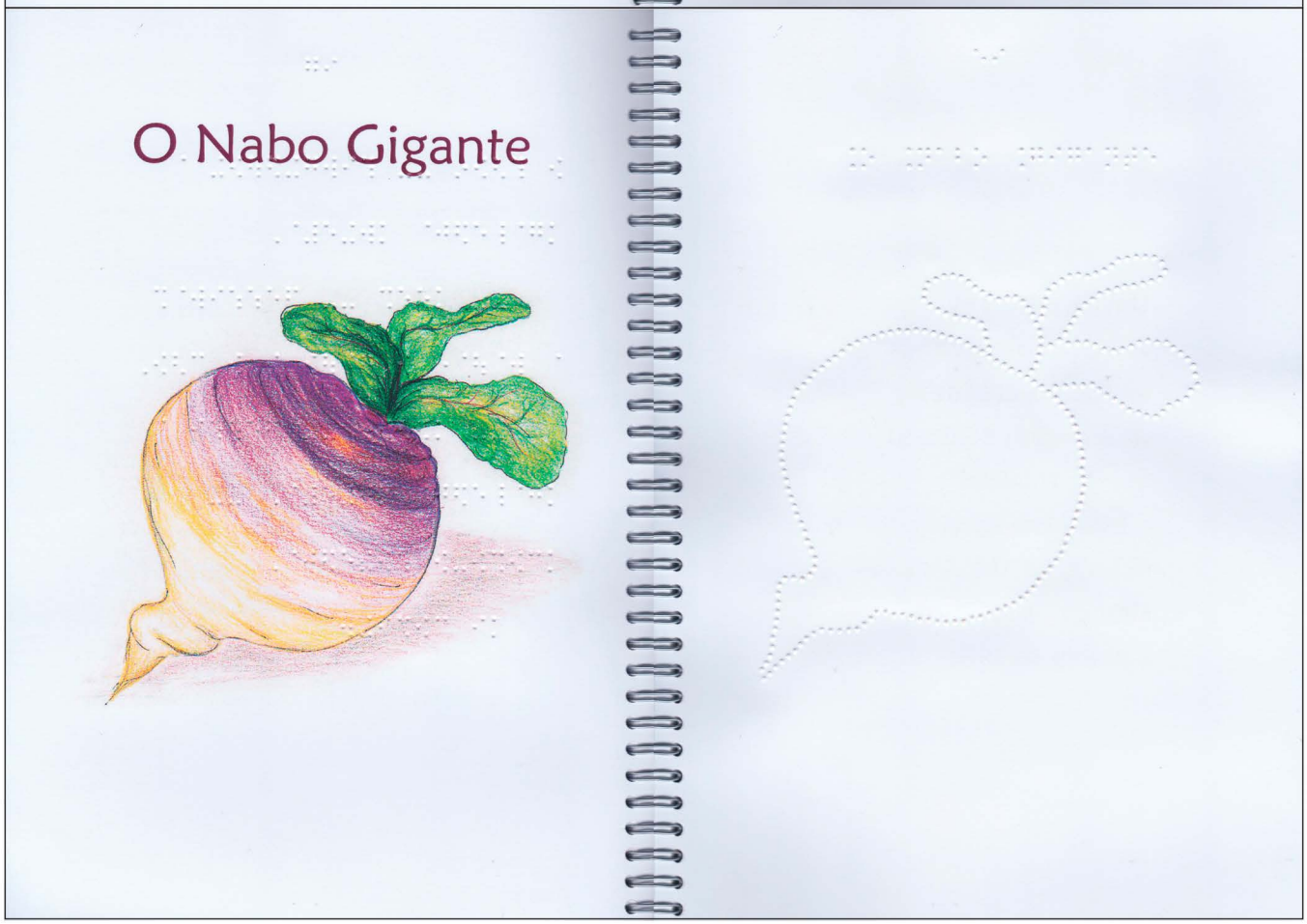
The Book has 6 Illustrations total, 1 for each of the 5 stories and 1 for the cover. Each Illustration seems to have been made with coloured pencils. The titles of the stories use the same typography as the rest of the book with only slight colour variation.

All illustrations have a copy of themselves translated to Braille in the following page, with the exception of the cover illustration that is the only one that doesn't have its correspondent match.

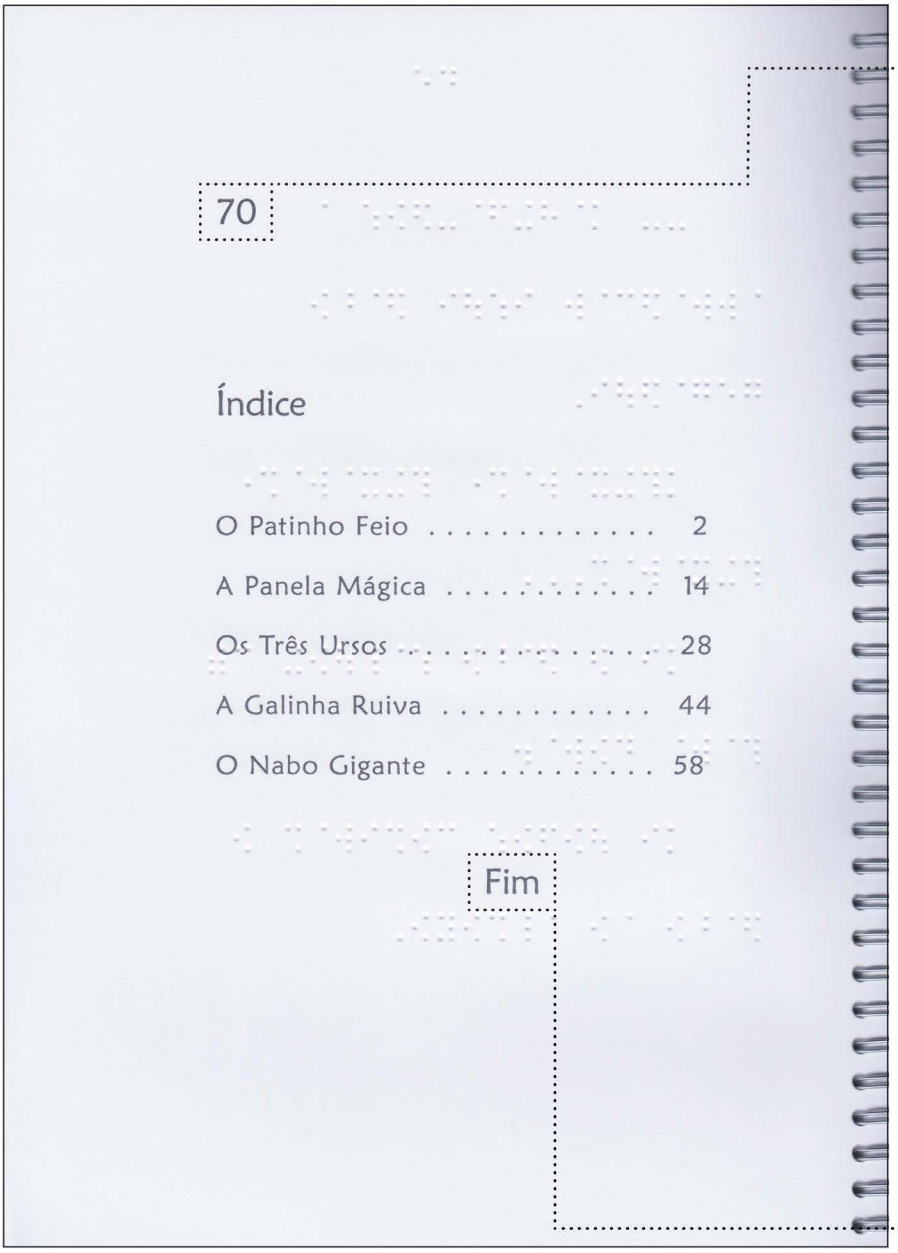
The Braille Illustrations are made with the same machine that the Braille is made with. This is apparent by its dot spacing and slightly edged lines, but it's not as strictly reserved to its grid or structure. This process seemed to be made to be as low-cost as possible, and manageable by a small team, that being observed throughout the segmentation of the book by tasks.







9./10./11. Title Illustrations "The Three Bears", "The Little Red Hen" & "The Giant Turnip" Santa Casa Misericórdia Porto



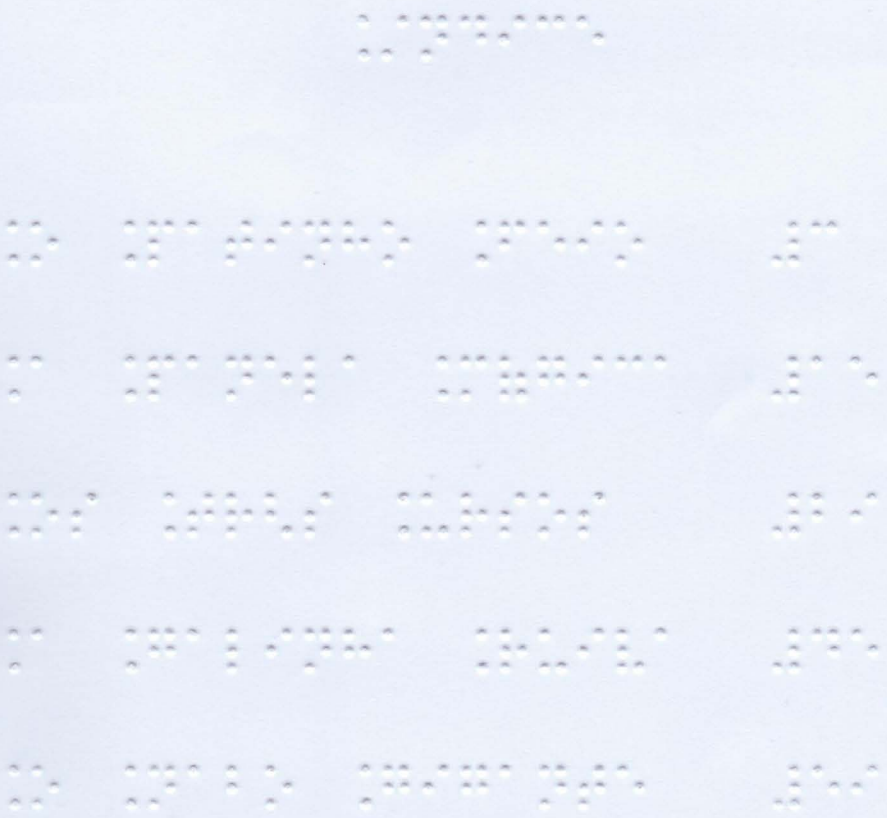
12. Written Index
Santa Casa Misericórdia Porto

6. INDEX & END PAGES

The last pages of the book are reserved for the Index. This seems to be the solution the team chose in consideration for someone that might open the book backwards on accident as its wire bound. The covers are made from a slightly denser paper so identifying those by touch is immediate, but direction needs to be given directly for orientation.

There are 2 obvious indicators that these are the last pages. One of them is the page number at the very top, while the other is “The end” written on the very bottom of the text.

71 (1930)



Fim / The End

7. PROS & CONS

POSITIVES

+ Light-weight and Flexible;

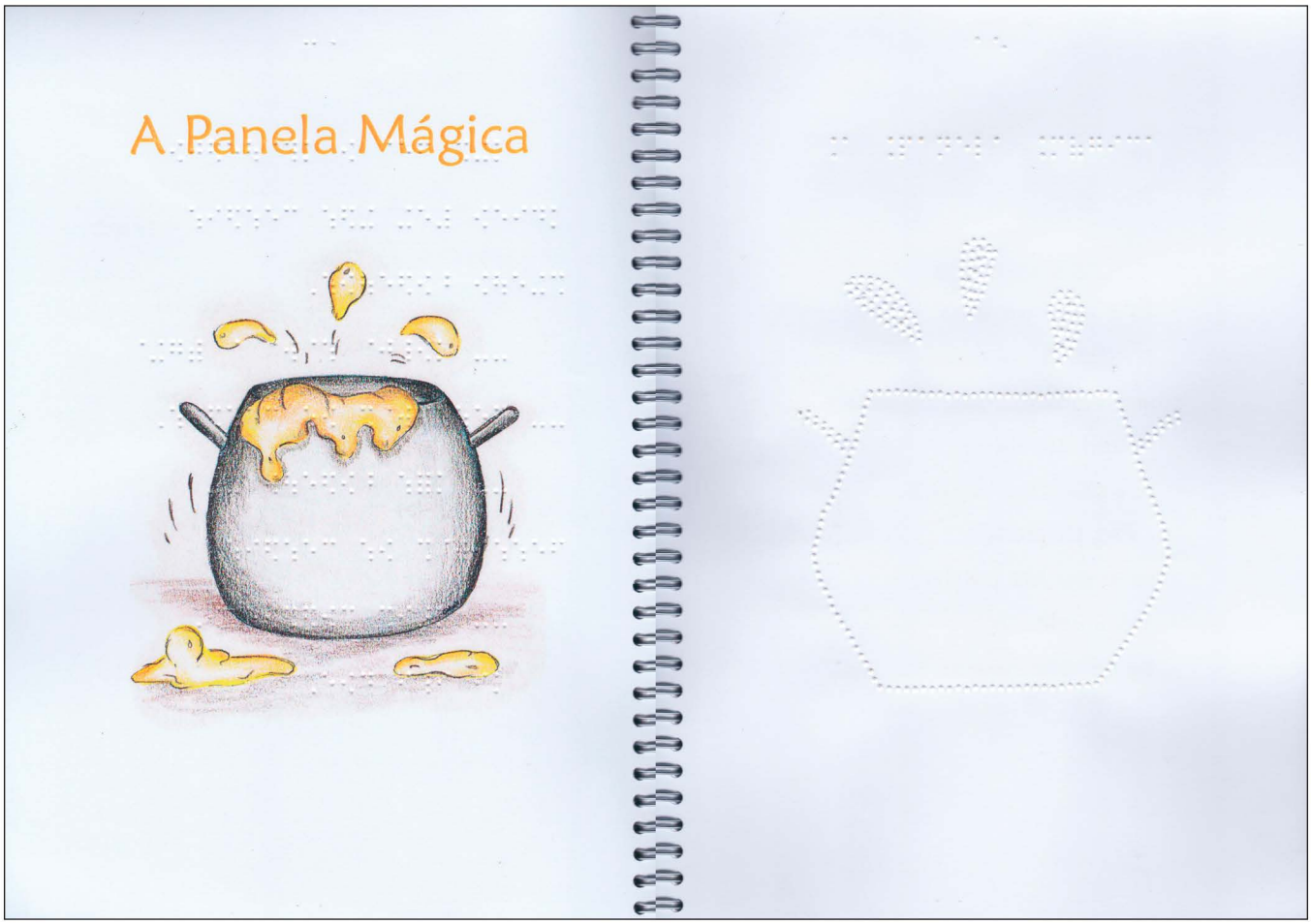
+ Simple and Dual-readeble;

+ Reusable and Educational;

+ Customizable and Expressive;

+ Low cost / Easy to Buy Materials;

+ Possible to be made manually using simple braille tools.



14. Title Illustration "The Magic Pot"
Santa Casa Misericórdia Porto

NEGATIVES

– Mismatched Typography can lead to confusion;

– Printing Errors and Braille breaks printed words often;

– Much unused space / Doesn't take advantage of size;

– Looks a bit outdated and too malleable (apperances only), not very engaging to non-visually impaired readers;

– Some pages with slightly more information are separated and impossible to dual-read (e.g. Editorial).

8. CONCLUSION

This Book analysis gave me some perspective on what to value when it comes to creating an educational object for reading Braille, as well as how to approach Dual-reading in books like this in general. What to learn from, where it can still be improved and where I can experiment while always keeping readability.

It's a good book for Braille learning, despite its minor errors when it comes to Braille and its new revisions, as it offers a variety of different tactile expressions, while being low-cost and extremely manageable. Something that can incentivise other personal projects and/or future adaptations.

COLOPHON

Title:
INVISIBLE BOOKS:
THE WORLD OF INVISIBLE DESIGN
Study and Analysis of the Editorial Design
in Books for the blind and visually impaired

Author:
Mariana da Silva Couto

Supervisor:
Joaquim Antero Magalhães Ferreira

Project Report presented to the Faculty of Fine Arts of the University of Porto to fulfil the requirements necessary to obtain the Master's degree in Graphic Design and Editorial Projects

Language Used:
English UK

Secondary Language Used:
Portuguese PT (With English Translations)

Author-date Style:
American Psychological Association (APA), 7th edition

Conclusion Date:
September 10, 2024

Page Format:
A4

Word Count:
23.620

Typeface Used:
Roboto & Archivo Type Families (12/13pt)

Shortcuts (3):
1) Index shortcuts that lead to their corresponding page number;
2) Chapter 2 has specific shortcut buttons that lead to further research on the topic mentioned with mirrored buttons to return;
3) At page number level, clicking on the chapter title returns reader to the Index

Appendix (2):
(1) A VISÃO. Amor e Melancolia. 1861. (96 Pages + 4 Book Covers)
(1) Book Analysis: "LER É CRESCER", Educational Book (20 Pages)
© SANTA CASA MISERICÓRDIA PORTO. JUNE 2010.