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THE USE OF BRAILLE IN THE FORM OF COMMUNICATION OF PEOPLE WITH DEAFBLINDNESS

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Abstract:
In research conducted on deafblindness, most studies addressing the forms of communication used by deafblind individuals focus on Tactile Sign Language, Sign Language in a reduced field, and some have even examined Haptic Social Communication. However, tactile braille as a form of communication has been little researched, despite being an important and widely used method for deafblind people. Therefore, this article provides context on the subject and explains how tactile braille works in its two possible uses, aiming to contribute to research in the field and to promote and encourage the use of this form of communication.

Keywords: tactile communication, Braille System, tactile braille, phalanges, deafblind

1. Introduction

Over the years, deafblindness has undergone changes in nomenclature until reaching its current form. The terms used were: "*hearing and* vision *loss*"; "*deafness and blindness*"; "*deaf-blind*" (with a hyphen) and, finally, "*deafblind*" (Cader-Nascimento, Costa, 2010; Lagati, 1995).

It is essential to write the word "*deafblindness*" together, without a hyphen, as this is a way of recognizing the complexity involved in a deafblind person and accepting them as a unique individual. Researcher Salvatore Lagati was one of the key figures responsible for advancements in the nomenclature of the word "*deafblindness*," leading to its current form: surdocego, surdocegueira (without separation or hyphenation).

It is important to emphasize that deafblindness will always involve impairment of both hearing and vision, and may be partial or total. Unlike multiple disabilities, which can be a combination of various types of disabilities (for example: physical and visual; auditory and motor, among others), deafblindness will always involve both hearing and vision (Masini, 2011; Maia, 2004; Keller, 2008).

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Among the main forms of communication used by deafblind people are: Tactile Sign Language; Sign Language in a reduced field; Tadoma; Oral language or amplified speech; writing on the palm of the hand; Tactile or manual Braille and Haptic Communication (Cambruzzi, 2007; Godoy, 2011). Regarding the forms of communication, the order of sensory losses will influence the choice of communication method by the deafblind person, as shown in the table below:

Table 1: Forms of communication and main characteristics

Form of communication	**Deafblind person who usually uses this form of communication**	**What is needed to use this form of communication**
Tactile Sign Language	Deafblind person who first lost their hearing	Knowledge of Sign Language and tactile perception
Sign Language in a reduced field	Deafblind person who first lost their hearing and has residual vision.	Having residual vision and knowledge of Sign Language.
Tadoma	Deafblind person who once had sight and hearing and remembers lip movements.	Having knowledge of spoken language and tactile perception
Spoken language or amplified speech	Deafblind person with residual hearing	Having residual hearing and knowledge of spoken language
Written on the palm of the hand	Deafblind person who once had sight and learned to write	Having knowledge of writing and tactile perception
Tactile or manual Braille	Deafblind person who first lost their sight	Having knowledge of the Braille system, writing, and tactile perception
Haptic Communication	Haptic communication is not a primary form of communication; it is a support (complement)	Tactile receptivity

Source: Table adapted from Lupetina (2019; 2020).

From Table 1, it is possible to see that the order of sensory loss influences the choice of communication method. In this article, we will focus on tactile or manual Braille, a form of communication widely used by deafblind people who first lost their sight (and then their hearing); however, few studies address this topic.

The scarcity of studies on this topic is one of the main justifications for the importance and relevance of this article. The use of tactile braille as a form of communication for deafblind people is a topic that has been little studied, both in Brazil and in surveys of foreign references. There are two types of "tactile braille" and the appropriate way to communicate using both types. Bringing this research topic to the forefront will be beneficial both for the field of study of deafblindness and for special and inclusive education in general.

1.1 Objectives of the study

The main objective of this article is to demonstrate how deafblind people communicate using tactile braille. This is broken down into the following specific objectives: (a) To reflect on the fact that deafblind people who first lost their sight and then their hearing usually choose tactile braille as a form of communication; (b) To demonstrate what tactile

braille looks like in the phalangeal modality; and (c) To demonstrate what tactile braille looks like when the fingers are in the position of a braille typewriter.

2. Tactile braille as a form of communication

Here we will talk about the two types of tactile braille. One that uses the phalanges of the index and middle fingers to mark the braille points, and the other that uses the three fingers of each hand simulating the finger movements on a braille typewriter (Grupo Brasil, 2012; Lupetina, 2019).

2.1 Tactile Braille using the index and middle fingers

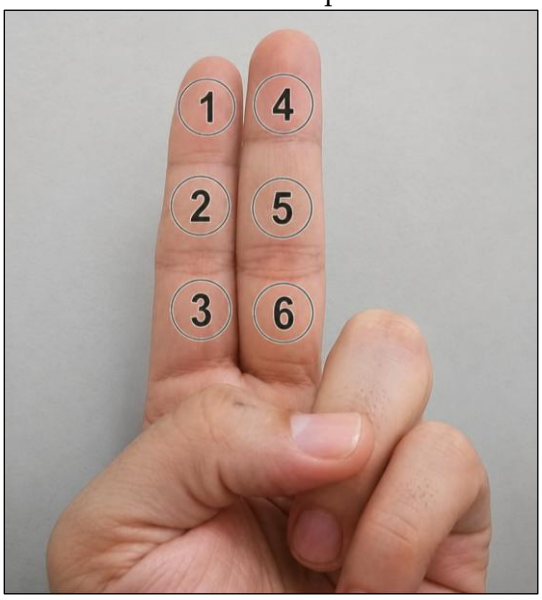
In this tactile braille modality, the interlocutor touches the phalanges of the deafblind person with their index finger, this touch being at the point corresponding to the position of the dot in braille. In this way, the deafblind person will tactilely receive the information about the letter and will mentally connect the letters indicated by touch to form the word and, subsequently, connect the words to form the sentence.

Some professionals and institutions will refer to this modality as: "*digital braille*", "*braille in hand*" or "*phalangeal braille*". In this text, we will adopt the nomenclature: "*tactile braille*", as it prioritizes the use of braille in a tactile way.

All people, when bending their fingers, create demarcation lines in the folds, and these lines provide the demarcation for the three rows and two columns with the points: 1, 2, 3, 4, 5, and 6 of braille. In this modality, the points of the braille cell are represented on the phalanges (segments) of the fingers of the person's own hand and/or that of an interlocutor.

Image 1 shows the six Braille points arranged on the phalanges of the index and middle fingers.

Image 1: Demonstration of the braille dots positioned on the finger phalanges



Source: Image created by the author to demonstrate the braille dots on the phalanges based on the readings of Abreu (2008); Lupetina (2019).

From the image, it is possible to see the location of the braille cell dots on the index and middle fingers, distributed as follows.

Table 2: Location of the six points of the braille cell arranged in six phalanges

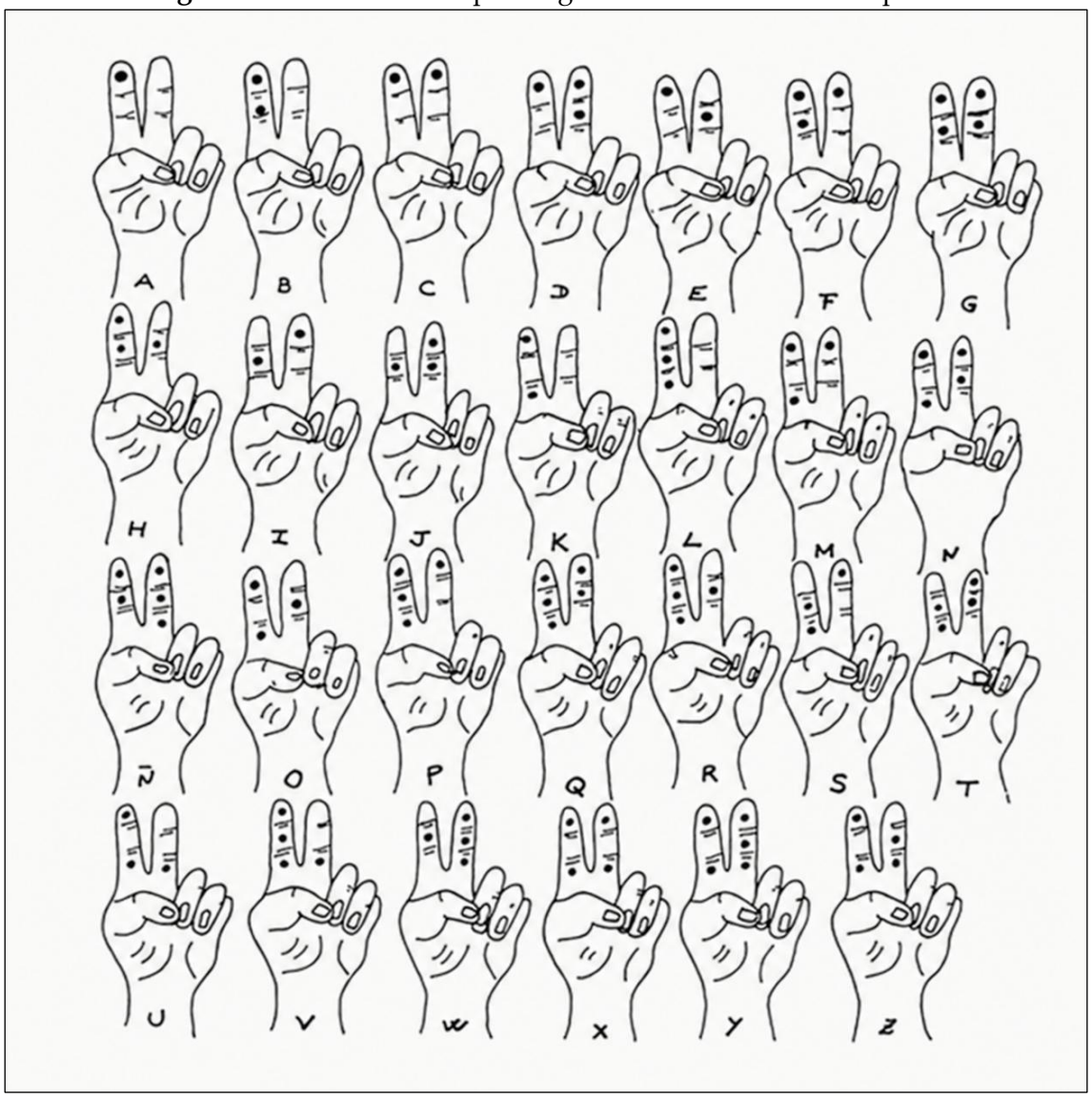
Braille dot	**Location**
Dot 1	Proximal phalanx of the index finger
Dot 2	Middle phalanx of the index finger
Dot 3	Distal phalanx of the index finger
Dot 4	Proximal phalanx of the middle finger
Dot 5	Middle phalanx of the middle finger
Dot 6	Distal phalanx of the middle finger

Source: Table prepared by the author (2026).

This form of communication has the advantage of not requiring the use of equipment or materials, only touch and knowledge of Braille. This communication method can be used in any environment and promotes the autonomy and independence of the deafblind person.

To contribute to the practice and dissemination of this tactile braille modality, it is necessary to know the corresponding position of the braille on the phalanges. The touches must be precise, consistent, and respect the tactile processing time of the interlocutor. Practice and consistency will contribute to the development and fluency of this form of communication.

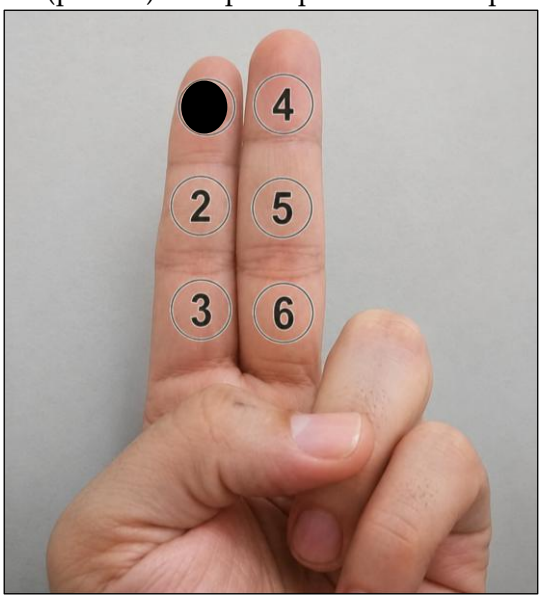
Image 2: Braille dots on the phalanges for each letter of the alphabet



Source: Image adapted by the author from material by Grupo Brasil (2012).

From this image of the alphabet, it is possible to see that the dots for each letter are exactly the same as the dots in the Braille system written on paper; the difference is that they are represented by touching the phalanges of the index and middle fingers with the pad of the index finger. Therefore, to indicate the letter "a", one must touch "dot 1".

Image 3: Vowel a (point 1) → tap the phalanx corresponding to point 1



Source: Image created by the author to demonstrate the location of touch point 1 on the phalanges, corresponding to the vowel a.

It is important to clarify that the speaker should, with the pad of their index finger, touch point 1, corresponding to the vowel 'a', to demonstrate that it is the vowel 'a'. The receiver – the deafblind person – will mentally connect the letters and form the word.

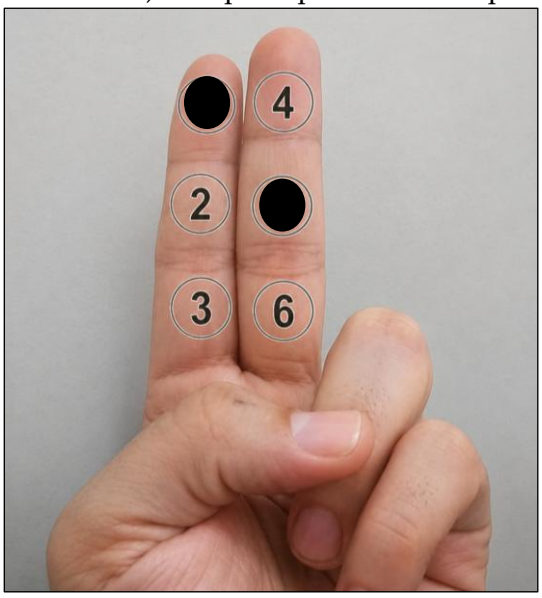
To tactilely indicate that a word has been completed and another is about to begin, the speaker should make a light "slide" or "sweep" (like a smooth horizontal stroke) on the other person's palm, from left to right (or top to bottom). This "sweep" on the hand will tactilely indicate to the receiver that they have finished that word and are about to begin another. This movement acts as an equivalent to a space bar or a period. It signals that the previous letters form a complete block and that a new word will begin immediately afterward.

Another useful strategy for tactile perception is to pause. After the transition movement, hold the person's hand for a second before starting the first letter of the new word. This also contributes to the tactile understanding of the end and beginning of a new word.

It is important to maintain a consistent tactile writing rhythm for the letters, with the same pressure and speed, so that the person recognizes the word as a whole. This rhythmic continuity will help the receiver understand that the word has been completed after the pause, which can be confirmed by manually "scanning" the word.

Next, a demonstration of the other vowels in the tactile braille format of the phalanges.

Image 4: Vowel e (points 1 and 5) → tap the phalanx corresponding to points 1 and 5



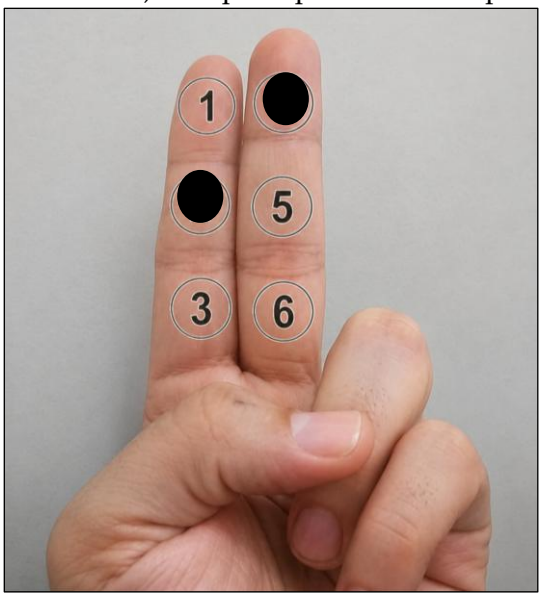
Source: Image created by the author to demonstrate the location of touch points 1 and 5 on the phalanges, corresponding to the vowel e.

It may seem like a complex form of communication, but it becomes fluid and tactilely understandable with practice and consistency. Tactile dialogue through tactile braille tends to become faster when practiced frequently by the same interlocutor and receiver – a deafblind person and a guide-interpreter, for example.

Another option is for the speaker to place their left hand (palm facing upwards) as a support for the receiver's hand and fingers – the person with deafblindness – to provide support and make communication less tiring in the long term. However, at times the person with deafblindness may wish to pause the communication to rest their fingers or flex them to stimulate blood flow.

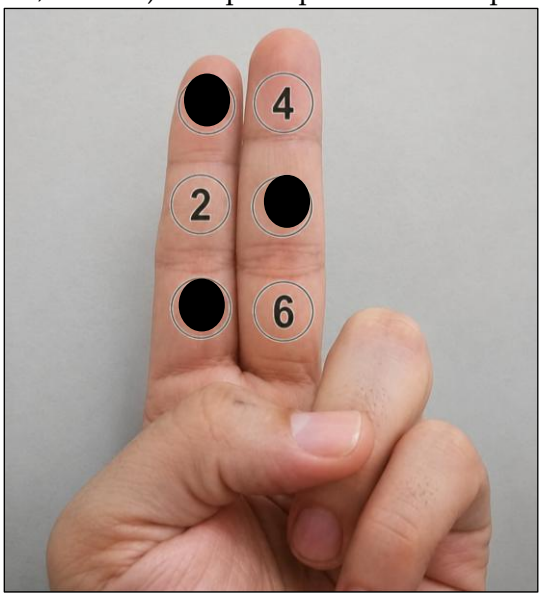
Next, the vowels “i”, “o”, and “u”.

Image 5: Vowel i (points 2 and 4) → tap the phalanx corresponding to points 2 and 4



Source: image created by the author to demonstrate the location of touch points 2 and 4 on the phalanges, corresponding to the vowel i.

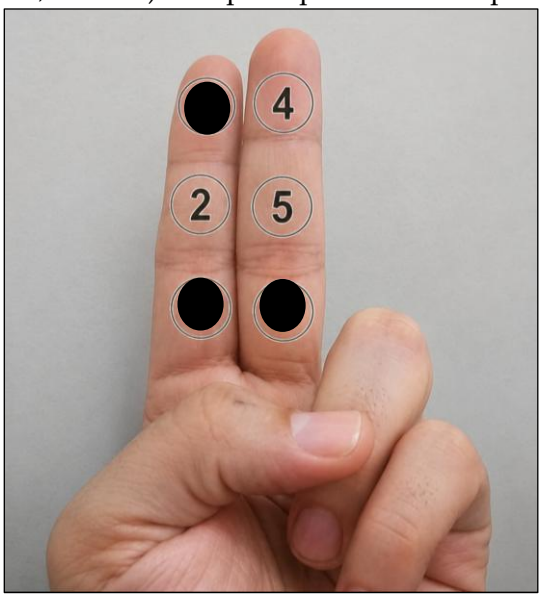
Image 6: Vowel o (points 1, 3 and 5) → tap the phalanx corresponding to points 1, 3 and 5



Source: Image created by the author to demonstrate the location of touch points 1, 3, and 5 on the phalanges, corresponding to the vowel o.

In these images, the positioned black circles show where the pad of the interlocutor's index finger should press to form each vowel.

Image 7: Vowel u (points 1, 3 and 6) → tap the phalanx corresponding to points 1, 3 and 6



Source: Image created by the author to demonstrate the location of touch points 1, 3, and 6 on the phalanges, corresponding to the vowel u.

From these images with the braille alphabet positioned at the respective braille points, it is possible to perceive the touch position to form each braille letter on the phalanges of the index and middle fingers, simulating a tactile braille cell.

The other type of tactile braille has finger positioning equivalent to the position of the dots on a braille typewriter.

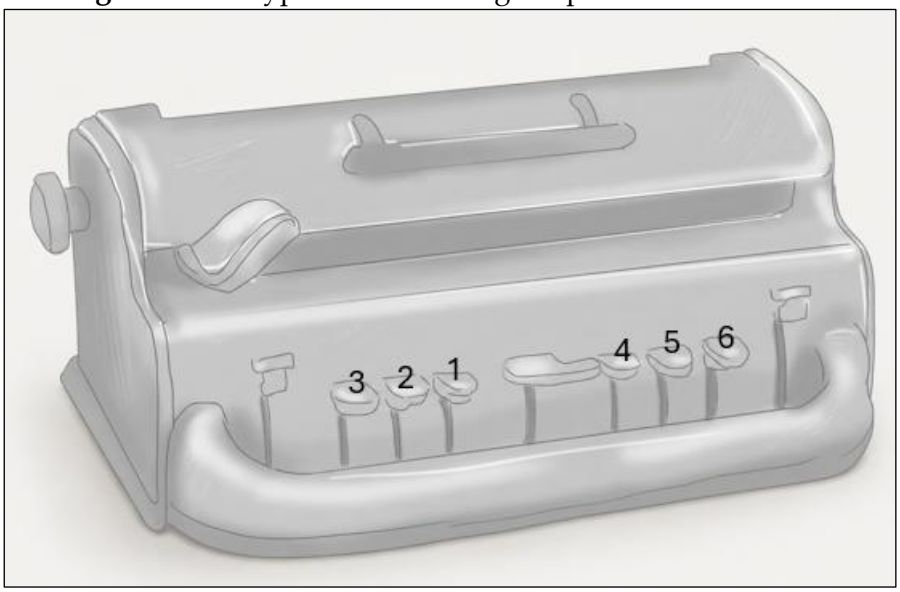
2.2 Tactile braille using three fingers of each hand simulating writing on a braille typewriter

This type of manual or tactile braille uses finger placement at points 1, 2, 3, 4, 5, and 6, with three fingers of each hand pressing down to simulate pressing a button on a braille typewriter.

The braille typewriter consists of only nine keys: points 1, 2, and 3 on the left; points 4, 5, and 6 on the right; the spacing key in the center; the down line key on the left side of the machine; and the key to return to the previous cell on the paper on the right side of the machine, totaling nine keys.

Therefore, the dots of the braille cell are arranged horizontally on the braille typewriter using both hands, with three dots in each hand. Below is an image of the braille typewriter with the dot numbers above indicating the position of each dot on the machine.

Image 8: Braille typewriter showing the position of the six dots



Source: Adapted by the author from wikiHow (n.d.), "How to Write in Braille" - https://pt.wikihow.com/Escrever-em-Braille

A person accustomed to using a braille typewriter to write memorizes these points and becomes quick at pressing the keys to form each letter in braille, then words and phrases. Therefore, in this tactile braille modality, the interlocutor (guide-interpreter) will place their hand on top of the receiver's (deafblind person's) hand and press down to tactilely signal each letter.

Tactile receptivity is fundamental in this process, as it allows the deafblind person to identify subtle differences in pressure, location, and movement. The more developed this perception is, the greater the accuracy in understanding the messages transmitted.

Furthermore, continuous practice promotes vocabulary expansion, communicative fluency, and the autonomy of the deafblind person.

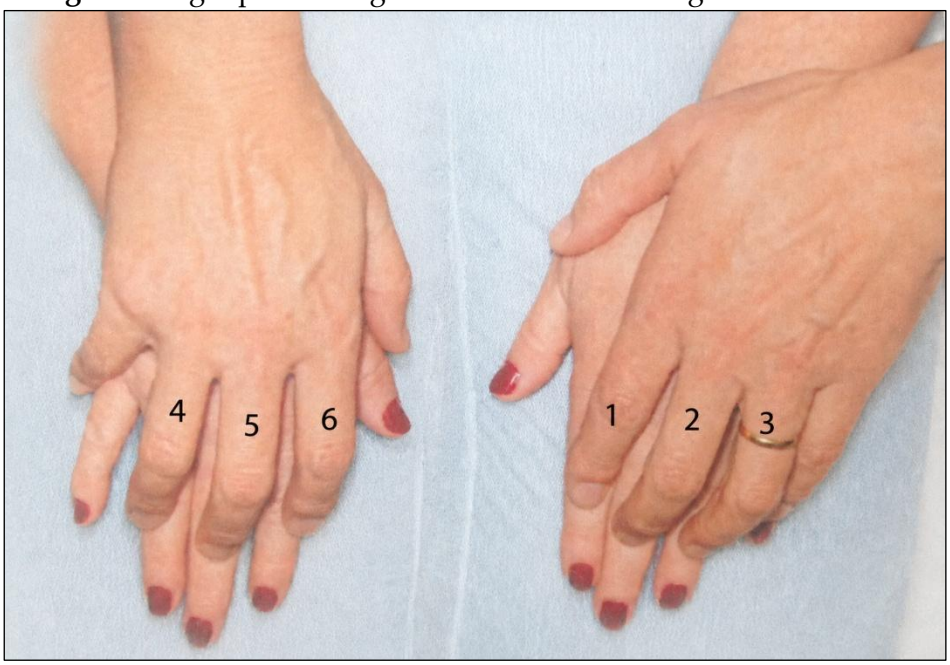
Next is an image of the hand positions in tactile braille, equivalent to the finger positions on a braille typewriter.

Image 9: Finger positioning in tactile braille equivalent to a braille typewriter

Source: Image created by the author based on Grupo Brasil (2012); Lupetina (2020); Walker (2018).

Next is the image with the numbers 1, 2, 3, 4, 5, and 6, demonstrating the position.

Image 10: Finger positioning and numbers indicating the dots in braille



Source: Image created by the author based on Grupo Brasil (2012); Lupetina (2020); Walker (2018).

From these images, it is possible to see that the braille dots are adapted for touch using the hand-over-hand technique – in this case, fingers over fingers – indicating the exact positioning of the letters as if they were being typed on a braille typewriter.
It is worth mentioning that this type of tactile braille is common among deafblind people of Asian descent, the most famous of whom is Satoshi (Grupo Brasil, 2012; Lupetina, 2020). Because he initially suffered from visual impairment, he learned the Braille system and used a braille typewriter; later, after losing his hearing, he took advantage of his existing braille knowledge and adapted it to tactile braille.

3. Results and conclusions

The main objective of this article was to present and demonstrate the two modalities of tactile braille as forms of communication used by deafblind people, and to highlight that this communication modality is usually chosen by people who first experienced partial or total visual impairment and, subsequently, visual impairment. In this way, they learn to write and read in braille while blind, and when they become deafblind, they transition to tactile braille.

The choice of each modality will be related to the Braille writing and reading instrument used in practice. If the deafblind person, while blind, used a slate and stylus, they will opt for the tactile Braille modality of the phalanges. Furthermore, when still blind they wrote in Braille on a Braille typewriter, upon becoming deafblind, they will prefer the tactile Braille modality using finger positioning to simulate a Braille typewriter, as they take advantage of existing knowledge to contribute to tactile communication.

It is worth arguing that, more than just a technique for transmitting information, tactile braille represents a tool for inclusion and social participation. Through it, deafblind people can express desires, feelings, opinions, and knowledge, strengthening their independence and guaranteeing the exercise of their communication rights, as well as receiving information from the outside world and communicating with other people.

However, for this to happen, more and more people need to allow themselves and become interested in learning about tactile braille in order to communicate with more deafblind people and recognize that using manual contact and the touch of braille on the hands – whether in the phalangeal modality or in the positioning of the fingers simulating a braille typewriter – is to recognize touch as a legitimate and efficient channel for human interaction, contributing to more accessible and meaningful communication.

Conflict of Interest Statement
The author declares no conflicts of interest.

About the Author
Professor and researcher at the Benjamin Constant Institute (IBC) in the Postgraduate Program in Teaching on the Theme of Visual Impairment (PPGEDV). Currently teaches postgraduate courses in Audio Description as an accessibility resource for people with visual impairments and Scientific Research Methodology and Ethics in Research. Also teaches basic education to students with visual impairments in the PEVI - Educational Practices for Independent Living program. Coordinates the Research Group on the Braille System (GPESBRA) and participates as a collaborator in the Laboratory for Studies and Research in Education, Diversity and Inclusion (LEPEDI) linked to UNIRIO/UFRRJ. She was a visiting professor at the Center for Resources for Digital Inclusion (CRID) in Portugal (2022). She completed a Postdoctoral internship in Education through the Postgraduate Program in Education, Contemporary Contexts and Popular Demands at UFRRJ. She also completed a post-doctoral internship in Social Memory through the Postgraduate Program in Social Memory at the Federal University of the State of Rio de Janeiro. She holds a PhD in Education from the State University of Rio de Janeiro (UERJ) and a master's degree in education from UNIRIO. She has training as a Psychomotor Therapist and Psychopedagogue and initial training in a bachelor's degree in Pedagogy from the Federal University of Rio de Janeiro (UFRJ). She is certified as a Guide-Interpreter to work with deafblind people by the Brazilian Group for Support to the Deafblind and the Multiple Sensory Disabled. She is a member of the Brazilian Association of Researchers in Special Education (ABPEE) and the Brazilian Association of Educators of Visually Impaired People (ABEDEV). She is the author of the books: "Life Stories of Individuals with Acquired Deafblindness" (2020) and "Female Voices: Narratives of Blind Teachers" (2022), which competed for the 65th Jabuti Prize in the Humanities category. She is also the author of the accessible multi-format children's book "A Pig Named Joseffina" (2023), a book in large print, Braille, and audiobook, which was launched at the 40th Rio Book Biennial. As a result of her Post-Doctorate in Social Memory, she produced (2024) the documentary "Voices of Knowledge: Memories of Blind Teachers" in an accessible format: with audio description, Libras (Brazilian Sign Language), and descriptive subtitles. Her research focuses primarily on: Deafblindness, Visual Impairment, Braille System, Audio Description, and teacher training.

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