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Knowledge of Braille for the blind by sighted persons

معرفة الأشخاص المبصرين بطريقة برايل للمكفوفين

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Article info:	Abstract
Article history:	The present study aimed to investigate what the sighted persons know about Braille, and to achieve this goal, the two researchers used the descriptive exploratory approach through designing an electronic questionnaire consisting of 16 questions divided into two main sections: (generalities by Braille - specifics by Braille)
<i>Received : 19-05-2020</i>	
<i>Accepted : 20-06-2020</i>	The questionnaire was applied to an exploratory sample to verify its psychometric properties, then it was published in different scientific and student groups on the social networking site (Facebook); it was answered by (60) people with a high educational level of different specializations in Algerian and Arab universities (Tunis, Morocco, Syria, Iraq, Sudan)
Key words:	
<i>Braille</i>	Results were analyzed using the percentage by the Statistical Package for Social Sciences program (Spss), and the final results are: 44.7% of the sighted people know generalities of Braille, and 28.71% of sighted people know specifics of Braille.
<i>Blind</i>	
<i>Sighted persons.</i>	Finally, the study recommended the sighted people should be introduced to Braille in order to achieve the full integration of the blind in society.

ملخص	الكلمات المفتاحية:
هدفت الدراسة الحالية إلى استقصاء لما يعرفه الأشخاص المبصرون عن طريقة برايل للمكفوفين، ولتحقيق هذا الهدف استخدم الباحثان المنهج الوصفي الاستكشافي؛ وقاما بإعداد استبيان إلكتروني مكون من 16 فقرة مقسمة على بعدين أساسيين هما: (عموميات عن طريقة برايل - خصوصيات عن طريقة برايل).	برايل المكفوفين المبصرين.
طبق الاستبيان على عينة استطلاعية للتأكد من خصائصه السيكومترية، وبعد ذلك تم نشره في مختلف المجموعات العلمية والطلابية على موقع التواصل الاجتماعي (Facebook)؛ حيث تم ملؤه من طرف عينة بلغت (60) شخصا مبصرا من أصحاب مستوى التعليم العالي في التدرج وما بعد التدرج من مختلف التخصصات في الجامعات الجزائرية، والجامعات العربية (تونس، المغرب، سوريا، العراق، السودان)	
حللت النتائج باستخدام النسبة المئوية بواسطة برنامج الحزمة الإحصائية للعلوم الاجتماعية (Spss)، وقد أسفرت النتائج النهائية على ما يلي: 44.7% من المبصرين يعرفون عموميات عن طريقة برايل، و 28.71% من المبصرين يعرفون خصوصيات عن طريقة برايل؛ وعليه يمكننا القول أن الأشخاص المبصرين يعرفون بعض العموميات حول طريقة برايل، وقليل منهم فقط يعرفون خصوصيات حول طريقة برايل.	
وفي الأخير أوصت هذه الدراسة، بضرورة تعريف الأشخاص المبصرين بطريقة برايل؛ وذلك كتعبير من الأشخاص المبصرين عن اهتمامهم وتقبلهم لفئة المكفوفين، وتحقيق الدمج الكامل لهم في المجتمع.	

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1-Introduction

“All children, including children with special educational needs, have a right to an education which is appropriate to their needs. The aims of education for pupils with special educational needs are the same as apply to all children. Education should be about enabling all children, in line with their abilities, to live full and independent lives so that they can contribute to their communities, cooperate with other people and continue to learn throughout their lives. Education is about supporting children to develop in all aspects of their lives”. (National Council, 2014, p. 7)

The blind are a group of people with special needs, they need to learn with the special methods that are appropriate for them, and Braille is considered the basic method for teaching them to read and write.

“Braille is the foremost tactile reading and writing system and is considered the primary means by which people who are blind can become literate. It is a basic medium of communication and has been an essential component of programs that educate children who are blind. Braille has been called “the key to opportunity, the means of emancipation, and the greatest gift to the blind”. (Kway.E. H, 2010, p. 326)

“Blind people who know Braille and use it find success, independence, and productivity. A recent survey of 500 respondents by the National Federation of the Blind Jernigan Institute revealed a correlation between the ability to read Braille and

a higher educational level, a higher likelihood of employment, and a higher income.

Hundreds of thousands of blind people have found Braille to be an indispensable tool in their education, their work, and their daily lives”. (National Federation, 2009, p. 3)

“According to (Rooma Nadeem) In order to introduce braille successfully to the child with visual impairments; teachers, parents and educational assistants need to display the positive attitude towards braille”. (Rooma, 2015, p. 18)

As for the sighted people who make up the majority of society, not all of them can learn Braille. They see no benefit from this, but knowing this method and its fundamentals is the least that society can offer the

blind to facilitate their integration process. From this we present the problem of the current study:

1.1. Problematic

What do the sighted persons know about Braille?

1.2. Hypotheses

We can answer the problematic of the study through the following two partial hypotheses:

- Sighted persons know generalities about Braille.
- Sighted persons know specifics with Braille.

1.3. Keywords:

- Braille: A method of reading and writing for the blind based on a system of prominent points, devised by the Frenchman Louis Braille.
- Blind: They are totally or partially blind; those who depend on reading and writing in Braille.
- Sighted persons: are people who rely on their eyesight for reading and writing in the usual alphabet way.

1.4. Objectives of the study

That it is the present study to:

- knowing what the sighted persons know about Braille.
- Knowing the percentage of sighted people who know generalities about Braille.
- knowing the percentage of sighted people who know the specifics by Braille.

1.5. Importance of the study

The importance of the present study lies in knowing what the sighted persons know about Braille, and accordingly it is clear to what extent ordinary people care about the blind and their affairs.

2. Visual impairment

2.1 Definition of visual impairment

“Visual impairment is identified as a condition in which visual acuity is not sufficient for the individual to participate fully in activities of everyday life. Challenges in this category can range from a visual impairment (in which the person has some visual ability, the degree of which varies from person to person) to blindness”. (Grossenbacher, 2015, p. 8)

“Visual acuity levels of $< 20/400$ or $< 20/200$ in the better eye have been commonly used to define blindness. Visual impairment is defined as visual acuity of $20/60$ or less in the better acuity eye.

Many population-based surveys from less developed countries have reported blindness rates using visual acuity level less than $20/400$. More developed countries have often used visual acuity less than $20/200$ to define blindness”. (Salomao, 2009, pp. 541-542)

2.2 Prevalence of visual impairment

“The prevalence of blindness is defined as the number of affected individuals per hundred populations in a given period of time. It can vary considerably among countries depending on socio-economic factors and available health and eye care services. A prevalence of 0.25 in the general population is expected in communities with good economy and health services, rising to 1.0 or more in communities with very poor economy and health services.

The difference in prevalence is mainly because blindness from cataract, refractive errors, and corneal scarring (trachoma, corneal infections, and vitamin A deficiency) has been eliminated in communities with good economy and eye services. The problem of cataract blindness in the industrialized world has been largely solved through the availability of affordable, high-quality surgery with intraocular lens (IOL) implantation, resulting in cataract-care delivery that equals or is greater than the incidence of visually disabling cataract”. (Salomao, 2009, p. 542)

“The number of people visually impaired in the world is 285 million, 39 million blind and 246 million having low vision; 65 % of people visually impaired and 82% of all blind are 50 years and older”. (Mariot, 2010, p. 3)

2.3. Causes of visual impairment

“Globally the principal causes of visual impairment are uncorrected refractive errors and cataracts, 43% and 33 % respectively. Other causes are glaucoma, 2%, age related macular degeneration (AMD), diabetic retinopathy, trachoma and corneal opacities, all about 1%. A large proportion of causes, 18%, are undetermined”. (Mariot, 2010, p. 3)

2.4. Types of visual impairment

“Visual impairment is divided into two groups with distinct characteristics and needs: individuals with low vision and individuals with blindness.

Low-vision individuals have impaired visual function even after optical correction and use or are able to use their vision to perform tasks. In the educational field, students with low vision have residual vision, which enables them to read printed material with the aid of didactic resources and special equipment.

Blindness is the term used to describe total loss of vision and conditions in which individuals need to rely predominantly on vision substitution skills. In the educational field, a blind student does not use vision in the learning process”. (Alves, 2009, pp. 148-149)

2.5. Problems of Visually Impaired

“The visually handicapped children have many problems like behavior problems, problems of learning, problems of their placement in society or problems of social adjustment. Some problems are discussed below:

(1)Poor Intelligence: Research analyses reveal that visually impaired children have a poor I.Q.

Since they have impairments in the exploration of their environments, they have impairments also in concept formation resulting in their poor performance in intelligence tests. Some intelligence tests are measured by degrees of information, knowledge or experience. But for blind child, this pattern of scoring is reduced to a very low level.

(2)Academic Retardation: These children have poor academic achievements even if they use large types of Braille. They are noted to be retarded by at least one to two years and are found to be underachievers. Visual impairment is the main factor for slower acquisition of information but observation. These children have a slower reading rate and lack concreteness in instructional procedures.

(3)Slower Speech Development: Totally blind children cannot learn the art of speech by imitation.

They can only learn through what they hear from occasional touch observation. Through research it has been discovered that acquisition of words may get hampered by blindness also.

(4)Personality Disorder: We known that personality develop includes both hereditary and environmental factors. It is a psychophysi organization of the individual modified by his life experiences. For congenit blind children, life experiences go in their own ways which are totally different from normal children”. (Lovely Professional, 2012, p. 26)

2.6. Prevention of Visually Impairment

“There are following prevention methods of visual impairment:

- Protect the eyes from excessive exposure to sun rays, intensive heat, X-rays and injuries.
- Educate families that night blindness is an early warning sign of exophthalmia and can be treated by feeding vitamin A in oil by mouth.
- Take a good and nourishing diet rich in protein and vitamin, such as milk, papaya, mango, carrot, spinach, egg and fish.
- Obtain suitable glasses after getting the eyes tested.
- Power of glasses changes with the progress of cataract.
- Organize eye checkup camps with the involvement of the local eye hospital or the local Ophthalmic Surgeons.
- Arrange for the eye checkup of all these cases and provide suitable glasses or eye drops etc”. (Lovely Professional, 2012, p. 61)

3. Braille

“It was not until the 18th century that people who were blind were considered capable and worth of being educated. The change in attitude was the result of the works of Frenchmen: “Denis Diderot” and “Valentin Hauy” in the 18th century and “Louis Braille” in the early 19th Century. The works of those individuals planted the idea that people who were blind were capable of being educated and that their intellectual abilities were intact, despite their loss or lack of vision”. (Kimeto, 2010, p. 16)

3.1 Definition of braille

“Braille is a tactile method of reading and writing for blind people developed by Louis Braille (1809-1852), a blind Frenchman. The braille system uses six raised

dots in a systematic arrangement with two columns of three dots, known as a braille cell. By convention, the dots in the left column are numbered 1, 2 and 3 from top to bottom and the dots in the right column are numbered 4, 5 and 6 from top to bottom”.

1 ● ● 4

2 ● ● 5

3 ● ● 6

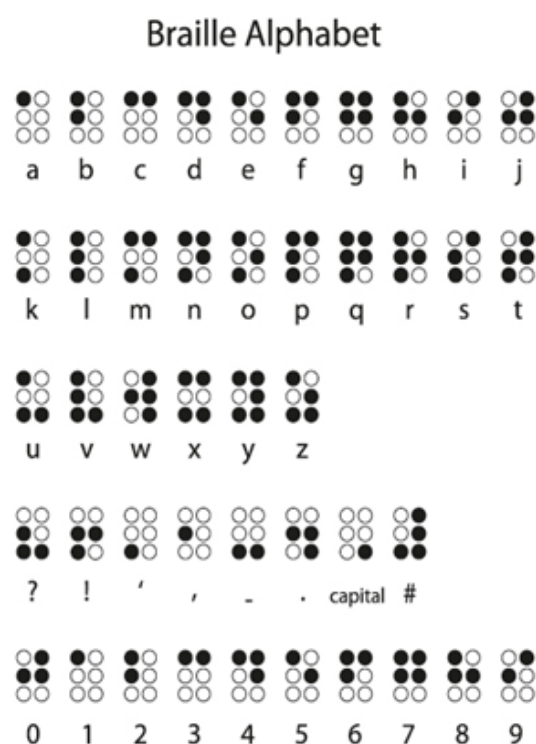
(Christine, 2013), “and were numbered for easy reference. According to RNIB (2000) Braille is a system of writing using dots which can be read visually or tactually for learners with visual impairment. A sign which occupies one space is termed as one space sign and a term which occupies three spaces is termed as a three space sign, dots 1 or dot 4 is termed as an upper sign; a sign containing neither dot 1 nor dot 4 is termed as lower sign”. (Kimeto, 2010, p. 14)

“There are three major types of devices used for writing braille by hand: slate and stylus, braille writer, and braille note taker”. (Mary, 2009, p. 11)

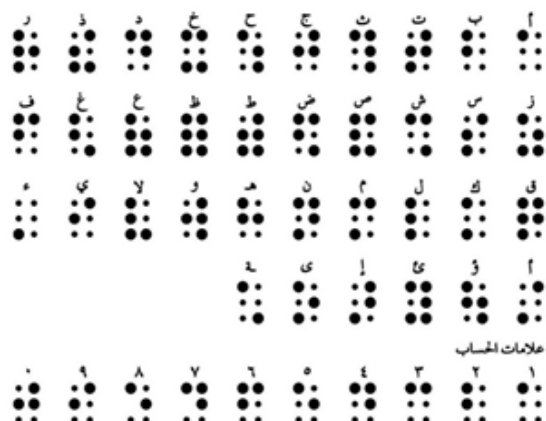
Below we show you the English and Arabic alphabet in Braille:

Figure 1

English alphabet in Braille



Source: (Noah, 2013)

Figure 2**Arabic alphabet in Braille**

Source: (Noah, 2013)

3.2 Louis Braille

“Louis Jean- Philippe Braille was born in the small village of Coupvray, France, just outside Paris, in 1809. At the age of three Braille was blinded in an accident, probably resulting from playing with tools in his father’s harness-making shop”. (National Federation, 2009, p. 7)

“Louis Braille studied at a school for blind students where the few books made for the blind were heavy and hard to read.

A retired French army captain, Charles Barbier, came to visit the Royal Institute for Blind Youth. He had invented a way for soldiers to send messages to each other at night without needing light or having to talk.

Louis was excited about this new way to read. He spent most of his free time learning the system. He knew it would have to be made simpler. He also had to find a way to include numbers and punctuation. So in his spare time and late at night, Louis worked hard to improve the captain’s system”. (Kushner, 2005)

“The Braille system was eventually adopted by the Royal Institute for the Young Blind, and two years after Braille’s death it became the official system of reading and writing for the blind in France. To this day Louis Braille is considered a national hero in his native country; his body is interred in the Pantheon in Paris. The Braille code was later adopted in England because of advocacy by the founders of what is now the Royal National Institute of Blind People, and other

blind people and educational institutions for the blind began to use it”. (National Federation, 2009, p. 7)

“Braille cut the number of dots in the cell to 6 (to more easily fit under the fingertips) and, rather than a phonetic code, chose to create an alphabet so that correct spelling could be maintained. Louis Braille published his first version of the tactile system that bears his name in 1829. He published a revised version in 1834, and then again in 1837, which included numbers and music code symbols. Tragically, Braille died of tuberculosis in 1852 at the age of 43 years. The tactile system he developed was used at the school where he taught..., but was not officially recognized in France until 1854”. (Mary, 2009, p. 7)

3.3 Importance of Braille

“Although books are available in audio form, there is no alternative to Braille for the blind, who want to read a menu, sing a carol, write a phone number down or make a speech. Driven by anti-discrimination legislation, large organizations are increasingly recognizing the need to provide Braille translations in lifts, on menus, in hotel rooms and for bank statements.

Experts liken the invention of Braille for the blind to the invention of the printing press for the sighted. Although computers and the internet are now the tools of choice for millions of sighted readers, none has yet dispensed with pen and paper. Of 500,000 people in the UK who are registered (or registrable) as blind, around 50,000 have no alternative to Braille, is their sight is so bad that they cannot manage with large-print books. Of these an estimated 18,000 are current users of Braille”. (Laurance, 2009)

3.4. Critical factors for the development of Braille literacy skills

“Previous research indicated that the age at which Braille is learned may affect the speed at which Braille is processed; that is, children who were taught Braille before the age of 10 generally became faster readers.

The lack of tactual acuity is a problem faced by students learning to read through Braille and contributes to slow reading times compared to other print readers. However, through experience

and training, most visually impaired students can overcome this problem.

Instructional strategies have been identified that can increase the reading rates of students with visual impairments. From the available literature, it is readily understood that the daily instruction ranging from one to two hours is critical for the development of Braille literacy skills. Also, the research has shown that visually impaired students are at risk of advancing in school with poor, fragmented Braille skills if they have not had high-quality instruction during their elementary school years. Therefore, continued intensive instruction in writing and reading from a teacher who knows Braille is required throughout the elementary school years". (Daniela, 2015, pp. 3-4)

4. Field study procedures

4.1. Study Approach

The current study relies on the descriptive exploratory approach, which is the appropriate approach to the study requirements.

4.2. Study tool

The study tool consists of an electronic questionnaire specially prepared for the purpose of the study, which included 16 items divided into two sections:

The first section: (Braille generalities): includes the following paragraphs: (1-2-5-6-9-11-15)

The second section: (Braille specifics): It includes the following paragraphs (3-4-7-8-10-12-13-14-16).

This questionnaire has three alternatives: (Yes - No - I think so), and the following table shows the direction of the questionnaire paragraphs:

Table 1

The direction of the questionnaire Questions

	Question numbers	N
Positive questions	1-2-3-7-9-11-13-14-15-16	10
Negative questions	4-5-6-8-10-12	6
Total: 16		

4.3. Study Sample

The electronic questionnaire was published in

various scientific groups on the social networking site (Facebook), and the study sample reached (60) people of different age groups from sighted people with a high educational level, whether in the graduation, or after the graduation from various Algerian and Arab universities (Tunisia, Morocco, Syria, Iraq, Sudan).

4.4. Psychometric properties of the questionnaire

A) Validity of the questionnaire

The validity of the questionnaire was estimated by applying it electronically to a prospective sample consisting of (34) sighted persons, then calculating the internal consistency of the questionnaire by calculating the Pearson correlation coefficient between the degrees of the sample individuals on each dimension of the questionnaire and on the overall degree of the questionnaire using the statistical program Spss.26; (Statistical Package for the Social Sciences), the results are shown in the following table:

Table 2

Pearson correlation coefficient for the sections of the questionnaire

Sections	N	correlation coefficient	Significance level
Section 1	7	0.59	0.01
Section 2	9	0.87	0.01

The results shown in the above table refer to statistically significant correlation coefficients at the significance level of 0.01 between the two dimensions of the questionnaire and the total degree of the questionnaire, where the correlation coefficient for the first section is (0.59), and the correlation coefficient for the second section (0.87); this proves the validity of the internal consistency of the two sections.

B) The stability of the questionnaire

The consistency of the questionnaire was calculated using the alpha-Krumpbach method, where alpha-Krumpbach was calculated between each section and the total score of the questionnaire, and the results in the following table:

Table 3**Alpha Krumbach coefficient**

Sections	N	Alpha Krumbach coefficient
Generalities about Braille	7	0.64
Specifics about Braille	9	0.91

It is clear from this table that the coefficient of stability of the first section was (0.64), while the stability of the second section (0.91), which are high stability factors that allow us to trust this questionnaire, and therefore we can use it in the basic study.

5. Results and discussion**5.1. Presentation of the study results**

First: Regarding the first partial hypothesis: which states the following:

“Sighted people know generalities about Braille,” and we show the results of this hypothesis in the following table:

Table 4**Iterations and percentages of respondents' responses to first-dimension (Braille generalities)**

Questions	Yes		Non		Maybe	
	I	%	I	%	I	%
Q1	35	58.3	1	1.7	24	40
Q2	53	88.3	2	3.3	5	8.3
Q5	22	36.7	19	31.7	19	31.7
Q6	25	41.7	14	23.3	21	35
Q9	3	5	46	76.7	11	18.3
Q11	35	58.3	5	8.3	20	33.3
Q15	29	48.3	5	8.3	26	43.3

From the above table it is clear to us that:

- 58.3% know that the inventor of this method is “Louis Braille”.
- 88.3% know that this method is based on a system of high points.
- 31.7% know that writing is done this way from left to right.
- 23.3% know that this method is read from right to

left.

- 5% know that the blind are using a handy tool known as the “Braille palette” to write this way.

- 58.3% know that writing this way requires thick paper.

- 48.3% know that blind people leave an empty cell for the space between words while writing this way.

Through a simple process to find the average of this dimension, we collected the ratios, then divided them by the number of paragraphs (7), and we found: 44.74% know the correct answer to the paragraphs of this section (Braille generalities) while the percentage of those who erred in the answers is 25.28%, And 29.98% have doubt and are unsure of the correct answer..

Second: Regarding the second partial hypothesis, this states the following:

“Sighted people know Specifics about Braille” and its results are presented in the following table:

Table 5**Iterations and percentages of respondents' responses to second section (Braille Specifics)**

Questions	Yes		Non		Maybe	
	I	%	I	%	I	%
Q3	18	30	4	6.7	38	63.3
Q4	30	50	11	18.3	16	31.7
Q7	19	31.7	5	8.3	36	60
Q8	12	20	25	41.7	23	38.3
Q10	22	36.7	10	16.7	28	46.7
Q12	28	46.7	13	21.7	19	31.7
Q13	23	38.3	3	5	34	56.7
Q14	19	31.7	7	11.7	34	56.7
Q16	17	28.3	6	10	37	61.7

We note from the table the following:

- 30% know that the letter written in Braille is written in a cell consisting of (6) points.
- 18.3% know that not every high point represents a letter in Braille.
- 31.7% know that this method is taken from Charles

Barber's Military Code.

- 41.7% know that this method contains tashkil of letters.
- 16.7% know that blind people can erase typing errors in Braille.
- 21.7% know that Braille is not the same in all languages of the world.
- 38.3% know that blind people write "number mark" before writing the number to distinguish it from the letter.
- 31.7% know that a blind person uses a sign when the word is not completed at the end of the line.
- 28.3% know that Braille also includes musical symbols

After collecting the proportions of the answers to this section and then dividing them by the number of paragraphs (9), we find: 28.71% answered the questions of this section with correct answers (Braille Specifics), while 21.65% made mistakes, 49.64% felt suspicious and uncertain from the answer.

With this we can answer the second partial hypothesis and say: 28.71% of the sighted know Braille Specifics.

5.2. Discuss the results

Regarding the first partial hypothesis, the results showed that 44.7% of the sighted persons know generalities about Braille, which is a very small percentage, especially that the study sample is highly educated, The researchers attribute this to the failure of the participants in matters of the blind in informing the community of this group of people with special needs, and introducing them to their basic way of reading and writing (Braille).

As for the second partial hypothesis, the results showed that 28.71% of the sighted know Braille's privacy, which is a logical result because the blind and their teachers are more familiar with Braille details, while the sighted people who know the details about Braille, may be the parents of the blind and their brothers and friends, or specialists in Special Education.

Consequently, we can say that sighted people know some generalities about Braille, and few know Braille

Specifics.

6. Conclusion

Braille is the leading method in teaching and learning the blind, and the blind are part of this community, so the knowledge of Braille from Sighted persons expresses their interest in this group.

The results also showed that sighted people know some generalities about this method, so special education professionals and the interested in the affairs of the blind should do more to raise awareness and educate the community about the blind and their important way of reading and writing to achieve complete integration between them.

Conflict of Interest

The authors declare that they have no conflict of interest

- Annex.

A Questionnaire of what sighted people know about Braille

Instructions:

Respected Sir / Respected Lady

Here are questions about Braille for the blind; you are asked to answer directly by choosing the answer that expresses your opinion without resorting to research or inquiry, because the purpose of the questionnaire is to know what the sighted people know about this method from their current knowledge.

Thanks for your cooperation

N	Questions
1	«The inventor of this method is «Louis Braille
2	This method is based on a system of prominent dots
3	The letter is written in a 6-point cell
4	Not every high point represents a letter
5	This method is written from right to left
6	This method is read from left to right
7	This method is taken from Charles Barber's Military Code
8	This method lacks "tashkil" of letters
9	For writing, the blind uses a handy tool known as the Braille palette
10	The blind cannot erase writing errors
11	Writing in this method requires thick paper
12	Braille is one in all languages of the world
13	Before writing the number, the blind writes the number mark to differentiate it from the letter
14	Blind people use the back mark when a word is not completed at the end of a line
15	For the space between words, the blind leaves an empty cell
16	Braille also includes music tags

Answer choices: (Yes - No - Maybe)

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