

**ALTER LEXIA**



# ALTER LEXIA

Research project

Master degree in Graphic Design

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2018



# Alter lexia

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Causes and the consequences of dyslexia

The position of dyslexic pupils at school and how their difference is perceived by and large.

Impact of different writing systems on dyslexic learners and how graphic designers could suggest other ways to learn.

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# Alter lexia

Abstract

How can graphic designers  
change the image of dyslexia  
and help dyslexic people  
and help them learn  
with new graphic tools ?

## Abstract

I have chosen to work on this subject because it is estimated that 5% of the French population is dyslexic, which means there are over 4 million dyslexics in France. Moreover, it is a well-known fact that the French schooling system does not take dyslexia into account because teachers are not trained on how to deal with it.

Graphic designers could help the society to better integrate dyslexic people. In fact, they can help people better understand the problem of dyslexia and put people in the shoes of the people affected by this pathology. Besides, dyslexia is an interesting topic for graphic designers because they can play with words, letters, shapes and call into question the spelling rules.

The word DYSLEXIA is composed of the Latin prefix «dys» which means something bad and «lexia» meaning vocabulary.

I have chosen to entitle my dissertation «ALTER LEXIA», to replace the prefix «dys» by «alter», thus meaning another way of writing. My work deals with how graphic design can question the norm and help dyslexic people to learn in adapting graphic tools to the difficulty of the French language.

My dissertation falls into three parts. The first is about the current state of dyslexia and how to cure it. The second part is about the social aspect of dyslexia, that is to say, the place of dyslexic people at school and in the society. To conclude, the third part is about how to code the language for dyslexic people and the role of graphic designers. To develop my work I collaborated



with two therapists. First, I had an interview with my own therapist, Sabine Ladreyt. Then I communicated by mail with Julie Colmard, who helped me and advised me.

# Causes and the consequences of dyslexia.

To understand the causes and the consequences of dyslexia, I studied medical books. I read the book entitled *Neuropsychologie et trouble de l'apprentissage chez l'enfant*, written by Michèle Mazeau who is a rehabilitation doctor. Thanks to my research, I understood that there are different types of dyslexia. In fact, there are as many types of dyslexia as there are dyslexic people. However, there are two main categories - phonological dyslexia and visual dyslexia. For the first category, the difficulties come from grapheme-phoneme transition, in other words, people cannot read new words even if they are easy ones to read. For the second category, the difficulty comes from the global visualization of the word, that is to say, these people cannot memorize words, it is as though they always come across them for the first time. Some people are affected by both kinds of dyslexia.

I also studied Stanislas Dehaene's cognitive science books to understand the effects of dyslexia on people when learning to read and write. To enrich my knowledge on the means of remediation I studied alternative methods different from those of French speech therapists. I discovered the book *The gift of dyslexia* by the American writer Ronald D.Davis, in which he explained his own dyslexia remediation method. This man is an engineer and he is dyslexic. He created a re-education center for dyslexic people in the United States. In his book, Ronald offers a positive approach to dyslexia. He explains that it is a gift to master. If a child does not control that gift, he will develop the negative effects of dyslexia like learning difficulties. If he masters this gift, it will highlight the positive effects like creativity. Unlike English speaking countries, in France dyslexia is seen mainly as a handicap.

The position of  
dyslexic pupils at  
school and how  
their difference is  
perceived by and  
large.

I studied the position of dyslexic pupils at school and more generally how their difference is perceived by and large.

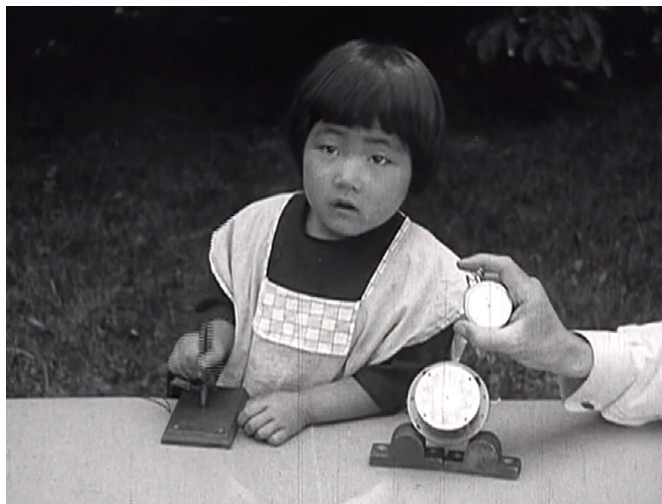
The World Health Organization places dyslexia in the category of mental disabilities. This classification allows dyslexic children to have more time for school examinations but it gives them a stigmatizing and negative image. In France, teachers are not fully aware of their difference and are not trained to teach dyslexic people. Dyslexic children lose confidence and good will because our education system is not appropriate. Indeed, dyslexia is a neurological disorder which causes reading and writing disorders and memorizing problems. To compensate for their weaknesses, dyslexics have to work harder, and be more creative than their peers all along their schooling.

Sadly in our society, differences and disabilities are considered as something negative and not normal while the norm, which is arbitrary, depends on someone's judgment. Dyslexic people are not less intelligent, they only think differently. Maybe if there were more alternative teaching in France, dyslexic children would be happier at school.

Some people questioned the French education system. After the Second World War, some philosophers, teachers and sociologists wanted to change the French and European education system. In England, the teacher Alexander Neil believed in the natural goodness of children. In Spain, Fransico Ferrer created the concept of « new education» based of social mixing, sex equality and against punishment. In Italy, Maria Montessori worked with mentally ill children to create a new educational method.

## Abstract

Joanna  
GRUDZINSKA,  
Révolution  
école 1918-1939.  
Montessori  
experiences  
with mentally ill  
children.



Photograph of  
Maria Montessori  
and her teaching  
material.



## The position of dyslexic pupils at school and how their difference is perceived by and large.

She criticized passivity in the learning process and developed a way to make pupils active and participative. For that she proposed workshops to make children handle to learn to acquire a gesture experience.

In France Celestin Freinet created an alternative school. Nowadays some people believe in another way of teaching like Céline Alvarez. She is a teacher who offered to work differently at nursery school based on the same principles as Montessori's and Freinet's. The result was excellent, all the children were above standard.



Céline ALVAREZ,  
Les lois naturelles  
de l'enfants  
[online] Class test  
at Gennevillier.



## Abstract

Céline ALVAREZ,  
Les lois naturelles  
de l'enfants  
[online].  
Language  
teaching material.



Poinçonnage



Plateau de coloriage de mandalas



Formes à dessins



Deux grandes ardoises vierges



Une grande ardoise à carreaux - *chiffres*



Petits cahiers vierges - *dès 3 ans*



Petits cahiers lignés 5 mm - *dès 4 ans*



Petits cahiers lignés 3 mm - *dès 5 ans*



Pochettes de vocabulaire



Boite de petits objets



Graphèmes rugueux



Alphabet mobile



Pochettes de lecture



The position of dyslexic pupils at school and how their  
difference is perceived by and large.



Céline ALVAREZ,  
Les lois naturelles  
de l'enfants  
[online].

The impact of  
different writing  
systems on  
dyslexic learners  
and how graphic  
designers could  
suggest other  
ways to learn.

I then studied the impact of different writing systems on dyslexic learners and how graphic designers could suggest other ways to learn.

The French alphabetic writing system is difficult for dyslexics to master because it is composed of abstract signs. Moreover, French writing is very complex because we have a lot of spelling and grammatical rules. Some rules do not seem logical - why should the masculine form take precedence over the feminine form ? Our language has a particular history which explains its complexity. Our writing system is based on phonetics, more precisely on the Phenician system. Little by little, we added vowels to the consonants.

The evolution of writing was linked to political decisions. In fact, the complexity of our writing rules comes from the desire to convey clear messages to the entire population. Indeed, if the rules are strict and established, the literate population cannot be mistaken when reading of the laws or official texts. The advantage is the equality between people who knew how to read. If everybody knows the same rules, they can read the same text. Moreover, writing is both a tool for freedom and independence. The French language as we know it today mixes German and Latin languages. Before 1530, people who could write, wrote in Latin. The King François I imposed French as the official language so that everybody understood the king's laws.

Before the advent of French as a language, the first forms of writing were figurative. It was invented by Mesopotamian people in the second half of the fourth

## Abstract

century, at the same time as hieroglyphs in Egypt. In Mesopotamia, writing was mainly used to count while in Egypt writing had a spiritual and intellectual dimension, only scribes were allowed to write. Among the pictorial form of writing, Chinese is the only one to have gone through the ages.

To put it in a nutshell, there are three different kinds of writing in the world : ideographic, each word has a specific sign, syllabic, a sign per sound, and alphabetic, each sign represents a broken sound.

Logically the alphabetic way of writing is simpler but dyslexic people think in images so ideographic and pictographic writing like Chinese could be easier for them.

From my own experience of dyslexia and my research, I can say there are three potential causes of dyslexia. The first is about the link between written language and the representation of reality, the second is about the spacial organization of writing and the third is about transmission of knowledge. Indeed, dyslexic children are visual thinkers of the word to understand its meaning and memorize its spelling. Our linear way of writing from right to left may not be the best suited for dyslexic people. Moreover, dyslexic children need to understand what they learn and need more time to learn.

Impact of different writing systems on dyslexic learners and how graphic designers could suggest other ways to learn.

| Phénicien | Grec archaïque | Grec classique | Etrusque | Latin archaïque | Latin |
|-----------|----------------|----------------|----------|-----------------|-------|
| Α         | Α              | Α              | Α        | Α               | A     |
| Β         | Β              | Β              | Β        | Β               | B     |
| Γ         | Γ              | Γ              | Γ        | Γ               | C     |
| Δ         | Δ              | Δ              | Δ        | Δ               | D     |
| Ε         | Ε              | Ε              | Ε        | Ε               | E     |
| Ζ         | Ζ              | Ζ              | Ζ        | Ζ               | F     |
| Η         | Η              | Η              | Η        | Η               | G     |
| Θ         | Θ              | Θ              | Θ        | Θ               | H     |
| Ι         | Ι              | Ι              | Ι        | Ι               | I     |
| Κ         | Κ              | Κ              | Κ        | Κ               | K     |
| Λ         | Λ              | Λ              | Λ        | Λ               | L     |
| Μ         | Μ              | Μ              | Μ        | Μ               | M     |
| Ν         | Ν              | Ν              | Ν        | Ν               | N     |
| Ξ         | Ξ              | Ξ              | Ξ        | Ξ               | O     |
| Ο         | Ο              | Ο              | Ο        | Ο               | P     |
| Π         | Π              | Π              | Π        | Π               | Q     |
| Ρ         | Ρ              | Ρ              | Ρ        | Ρ               | R     |
| Σ         | Σ              | Σ              | Σ        | Σ               | S     |
| Τ         | Τ              | Τ              | Τ        | Τ               | T     |
| Υ         | Υ              | Υ              | Υ        | Υ               | V     |
| Χ         | Χ              | Χ              | Χ        | Χ               | X     |
| Ψ         | Ψ              | Ψ              | Ψ        | Ψ               | Y     |
| Ω         | Ω              | Ω              | Ω        | Ω               | Z     |

Typographie  
et civilisation.  
Petite histoire  
de l'alphabet.  
Du Phénicien au  
Latin. [on line]



# Alter learning

Project

Showing dyslexia as a positive difference was my main goal.

Dyslexia can be a source of creativity for graphic designers. Difficulties are constraints and constraints can foster creativity. Moreover, dyslexia as a topic can give the opportunity for graphic designers to experiment because they can play with the writing rules, build and deconstruct the forms to create meaning.

Gradually I saw a strong connection between dyslexia and graphic design. Firstly, dyslexic people are visual thinkers, they see an image in their head while reading a text, like a drawing in the making. Secondly, to decipher written language and read, dyslexics have to cut up the elements of design into visual units. Thirdly, dyslexics rely on a three-dimensional spatial reasoning. This aspect can be a handicap to read because their eyes cannot see the letters well, which is confusing. However, their three-dimensional vision can be an asset because it gives them a clear visual awareness, which is a common characteristic with graphic designers.

To make my prototypes, I developed more particularly three aspects of dyslexia. Those are the three aspects explained previously.

First, one of the problems of dyslexia is that our written language does not look like the reality. Indeed, alphabetic writing is composed of abstract signs that are impossible to decipher if we do not know the rules and their meanings. Since dyslexics are image thinkers,



ideographic or pictographic systems like Chinese writing suits them better.

Second, another aspect of dyslexia is a different spatialization. Since dyslexics have three-dimensional spatial reasoning, they have difficulty in writing the words well. They can also sometimes write from right to left because it seems more logical to them. Offering letters to handle can help them better understand writing.

Last but not least, dyslexics need a particular mode of transmission of knowledge. Indeed learning to write is not something natural, we have to learn it. This learning is coded and standardized but it is not suitable for everyone. Dyslexics must go through other ways to learn to read and write to reach the same results as non-dyslexic people.

# Pr■t■type 1

Throughout my research I collaborated with a speech therapist.






























I observed how she worked with dyslexic children and I was inspired by one of her methods to create my first prototype. This is a method to teach children to build a sentence. Some dyslexic children tend to link all the words when they write. This method allows them to understand the function of each word.

The different categories of words such as verbs, prepositions, are represented by pictograms. The use of visual forms makes it possible for them to memorize the grammatical rules by stimulating their visual memory. I drew graphic signs for some categories of words like prepositions. Then, I engraved the signs with a laser cutter on wooden cards to be able to handle them and to stimulate kinesthetic memory.

However, I could not develop this prototype because it is a method invented by a speech therapist who does not wish to have it used by and large. Speech therapist training is required to understand how to use this method. What I liked about this method is the pictographic representation of a rule.



Set of pictograms with their captions.

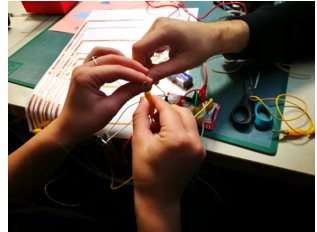
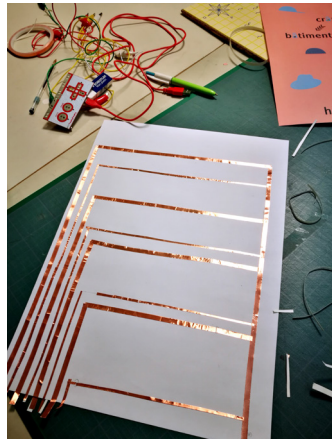
|   |   |   |   |   |   |  |   |
|---|---|---|---|---|---|--|---|
|    |    |    |    |    |    |   |  |
| déterminant singulier (la)  | déterminant pluriel (les)   | pronom singulier (tu)   | pronom pluriel (nous)   | déterminant féminin singulier (une infirmière)                                      | déterminant masculin singulier (un infirmier)                                       | déterminant féminin pluriel (des infirmières)                                      | déterminant masculin pluriel (des infirmiers)                                     |
|    |    |    |    |    |    |  |   |
| nom animé (le monsieur)   | nom inanimé (la chaussure)  | préposition de lieux (sur)  | préposition de temps (pendant)  | préposition de quantité (aussi)   | préposition de manière (sans)   |  |   |
|   |   |   |   |   |   |  |   |
| auxiliaire être   | verbe   | auxiliaire avoir  | verbe à l'infinitif (manger)  | verbe conjugué (mangeais)   | verbe participe passé (mangé)   | verbe participe présent (mangeant)   |   |
|  |  |  |  |  |  |  |   |
| et première conjonction de coordination   | ou première conjonction de coordination   | adjectif qualificatif féminin singulier (égarée)                                    | adjectif qualificatif masculin singulier (égaré)                                    | adjectif qualificatif féminin pluriel (égarées)                                     | adjectif qualificatif masculin pluriel (égarés)                                     |  |   |
|  |  |   |   |   |   |  |   |
| préposition de lieux (sur)  | avec première préposition de manière  |   |   |   |   |  |   |

## Pr■t■type 2

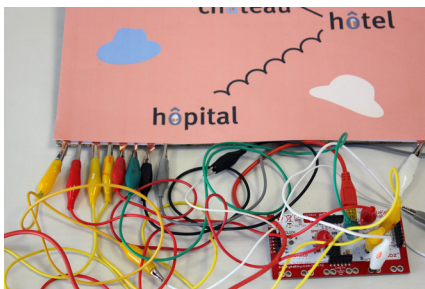
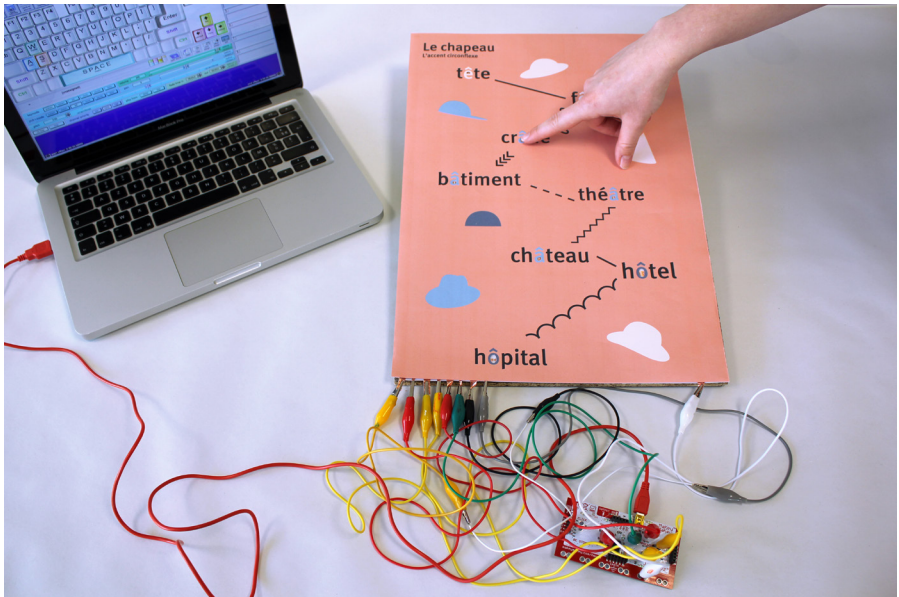
I then developed a second prototype - a tactile poster.

It is an educational tool to learn the words with a circumflex accent. I associated this sign with a hat because of its triangular shape. I created a story with eight words with a circumflex accent. When a child touches the first word, a sound is triggered and a nursery rhyme can be heard. As the child touches each word on the poster the story unfolds.

This method stimulates auditory, visual and kinesthetic memory. The problem with this method is that the child has to recite the whole nursery rhyme to remember which words have a circumflex accent.



mounting copper strips



Post and connect with the card Makey Makey

## Pr■t■type 3

I then made a third prototype which is an educational tool to help children memorize the spelling of words.

I created a set of ink stamps with letters and graphic shapes to combine. Mixing letters and shapes allow to create word pictures. With these tools the child can draw any shapes with the ink pads while developing his imagination and his creativity in a fun way.

The problem is that a lot of forms are necessary to build all sorts of words words. I thus decided to classify the words into lexical fields, for example the words associated with the sea. The forms I created are therefore inspired by the forms found in the universe of the sea such as a wave.



forms and letters stamps





## Prototype 4

I chose to develop a third prototype to solve my initial problem. I worked on an educational and fun tool to help any primary school children, whether dyslexic or not, to memorize the spelling of words and to create a lexicon of the words they know .

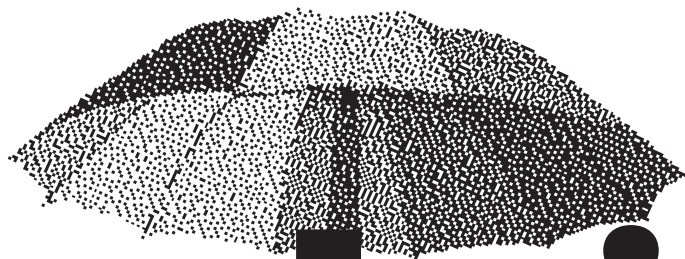
For this, I classified the words in three lexical fields  
- words related to the sea, the sky and the forest. For each category, I created a set of stamps and stencils . I selected images on the web. I then outlined them and processed in bitmap.

These new images were used to create stamps made of engraved rubber designed by a laser cutter as this tool allows to make precise patterns. For the stencils, I drew shapes related to the three categories of words on the computer. These stencils were then made in wood with a laser cutter.

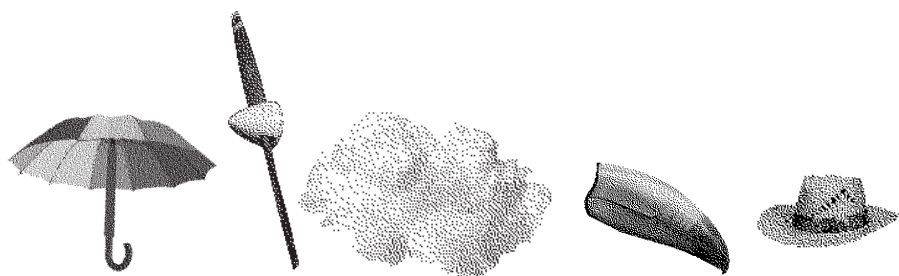
This prototype will soon be tested with dyslexic children. I expect them to have fun while using it and I do hope it will help them develop their creativity and help them in learning the spelling rules.



Les mots du ciel



pluie





# Vocabulary

## Vocabulary

### **Dyslexia - negative aspect**

- spectrum disorder
- reading disorder
- specific learning difficulty
- dysfunction
- neurological disorder
- working memory issues
  
- dyslexics have to work harder, and more creatively, than their peers throughout their school experiences
  
- the letters tend to slip
  
- lose confidence and their willingness

### **Dyslexia - positive aspect**

- interpret information differently
- visual thinker
- three-dimensional spatial reasoning
- common connections between objects
- good episodic memory
- compensate for weaknesses
- overcome

### **Learning for dyslexic people**

- remember facts as experiences
- examples or stories rather than abstractions
- learn by doing / figure things out
- put in situation
- learn from your mistakes
- contextualized
- they go by understanding rather than the memory
- word recognition
- decoding of language

## **Learning to write**

- spelling
- grammar
- word recognition
- decoding of language
- system of learning
- the phonetics approach
- semantics

## **Education system**

- current system
- education system is skewed against dyslexics

## **Links between dyslexia and graphic design**

- strong connection between design thinking and dyslexia
- breaking down the elements of a design into visual units



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I thank Mrs Orsola for her time, her investment and her precious help in writing my research project . I also thank her from the point of view different from that in French that she transmitted to me on the subject of dyslexia.

