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Dyslexia and emotions

An exploratory study on a sample of young
students

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Contents

Introduction p. 9

General introduction, p. 9

Structure of the work, p. 10

Note on the adopted terminology, p. 10

An accessible text, p. 11

Acknowledgments, p. 11

1 Learning disorders, a backbone p. 12

1.1 Defining Learning Disorders, p. 12

1.1.1 Something obscure, p. 12

1.1.2 Learning disorders, p. 13

1.2 Sources for the definition of LD, p. 14

1.3 Law 170/2010: the Italian change and the definition of “DSA”, p. 15

1.4 “DSA”, subtypes, p. 17

1.4.1 Dyslexia, p. 17

1.4.2 Dysgraphia, p. 17

1.4.3 Dysortography, p. 18

1.4.4 Dyscalculia, p. 18

1.5 General diagnostic criteria and comorbidity, p. 18

1.5.1 Diagnostic criteria, p. 18

1.5.2 Comorbidity, p. 19

1.6 Disorder or disability? p. 19

1.7 Differences, characteristics and difficulties, p. 20

1.8 Highlight: the role of the cultural context, p. 21

- 1.9 How can we identify learning disorders? p. 22
 - 1.9.1 Reading, p. 22
 - 1.9.2 Writing (disgraphia), p. 23
 - 1.9.3 Writing (dysortography), p. 24
 - 1.9.4 Calculating, p. 25
 - 1.9.5 Other difficulties related to LD, p. 26

Summary, p. 27

2 Reading and writing p. 28

- 2.1 Reading ability, p. 28
 - 2.1.1 Components of reading ability (Vellutino's model), p. 29
 - 2.1.1.1 *Visual and linguistic coding processes, p. 30*
 - 2.1.1.2 *Linguistic competence in reading, p. 30*
 - 2.1.1.3 *Memory processes, p. 31*
 - 2.1.2 Brain structures involved in the reading process, p. 32
 - 2.1.3 The Dual Route Model for reading aloud (Coltheart, 1978), p. 34
 - 2.1.4 Learning to read: the Uta Frith's model of learning to read, p. 36
- 2.2 The writing process, p. 36
 - 2.2.1 Underneath handwriting, p. 36
 - 2.2.2 Learning to write (Ferreiro e Teberosky), p. 37

Summary, p. 38

3 Dyslexia, possible explanations of developmental dyslexia p. 39

- 3.1 A bright and intelligent boy, p. 40
- 3.2 Cognitive level explanations, p. 40
 - 3.2.1 The phonological deficit hypothesis, p. 40
 - 3.2.2 Highlight: Dyslexia in different orthographies, p. 41
 - 3.2.3 The double deficit hypothesis, p. 42
- 3.3 Learning disability, p. 43

- 3.3.1 Dyslexia as a deficit in the procedural learning system, p. 43
- 3.4 Brain level, p. 44
 - 3.4.1 Magnocellular Deficit Hypotheses (visual and auditory), p. 44
 - 3.4.2 Cerebellar Deficit Hypothesis, p. 45
- 3.5 Genetic level, p. 46

Summary, p. 46

4 Dyslexia (and LD) in adolescents and young adults p. 47

- 4.1 Learning disabilities are lifelong, p. 47
- 4.2 Studies on adult with learning disorders, p. 47
 - 4.2.1 Does dyslexia continue in adolescence and adulthood? p. 48
- 4.3 Adult diagnosis, p. 49
 - 4.3.1 An instrument for the diagnosis of dyslexia in adulthood: Adult Dyslexia Check List (Vinegrad, 1994), p. 50
- 4.4 Assessment of cognitive characteristics of adult dyslexia, p. 51
 - 4.4.1 The Computerised screening for dyslexia in adults, p. 51
 - 4.4.2 A research by Padua University, p. 51

Summary, p. 53

5 Emotional problems associated with dyslexia p. 54

- 5.1 "The human side of dyslexia", p. 54
- 5.2 Emotional problems in the life of the dyslexic students: recent analysis, p. 57
- 5.3 Highlight: what do we mean with "internalizing problems"? p. 57
 - 5.3.1 Forms of anxiety: trait-anxiety and state-anxiety, p. 58
 - 5.3.2 Dyslexia and anxiety, p. 59
- 5.4 The construction of the self concept, p. 61
 - 5.4.1 The development of self concept and its relation with self esteem, p. 63

- 5.4.2 Self-concept and self-esteem of people with dyslexia, p. 65
- 5.4.3 Self-concept, self-esteem: further findings, p. 66
- 5.4.4 A study on young women and a questionnaire on self-esteem, p. 67

Summary, p. 67

6 Learning styles and compensation instruments in higher education p.68

- 6.1 “Neurodiversity”: claiming rights, p. 68
 - 6.1.1 How the concept of neurodiversity may be useful? p. 69
- 6.2 Cognitive styles and learning styles, p. 70
 - 6.2.1 Cognitive styles, p. 70
 - 6.2.2 Learning styles, p. 72
- 6.3 Different learning styles in people with learning disorders, p. 73
- 6.4 Supporting students with LD, p. 75
- 6.5 Compensatory instruments, p. 76
 - 6.5.1 Traditional books, digital books and audio books, p. 77
 - 6.5.2 Page format and fonts for dyslexic students, p. 78
 - 6.5.3 Speech application programming interface, p. 81
- 6.6 Projects supporting LD in Italy, p. 82
 - 6.6.1 AID, p. 82
 - 6.6.2 Other projects, p. 83
 - 6.6.2.1 *AIRIPA, p. 84*
 - 6.6.2.2 *Laboratory of Padua University, p. 84*
 - 6.6.2.3 *“Dislessia”, p. 84*

Summary, p. 84

7 Anxiety at school in a group of adolescents with DSA p. 85

- 7.1 Abstract, p. 85
- 7.2 Introduction, p. 85

- 7.3 Method, p. 86
 - 7.3.1 Participants, p. 86
 - 7.3.2 Materials, p. 86
 - 7.3.2.1 *The questionnaire, p. 86*
 - 7.3.2.2 *The information sheet, p.90*

- 7.4 Results, p. 91
 - 7.4.1 Questionnaire, p. 91
 - 7.4.1.1 *Significant results, p. 93*
 - 7.4.2 Information sheet, p. 98
 - 7.4.2.1 *Quantitative analysis, p. 98*
 - 7.4.2.2 *Responses to open questions, p. 102*
 - 7.4.2.3 *Questionnaire satisfaction survey, p. 105*

- 7.5 Discussion, p. 106
 - 7.5.1 Questionnaire, p. 106
 - 7.5.2 Information sheet, p. 106
 - 7.5.3 Questionnaire satisfaction survey, p. 107

- 7.6 Conclusions, p. 109
 - 7.6.1 Suggestions for further research, p. 111

General conclusions, p. 109

Appendix, p. 112

References, p. 122

Introduction

General introduction

It is difficult to provide a clear description of dyslexia and of the other specific learning disorders. A large number of books, handbooks and articles have been written over these last years on this matter, but many respects remain confused, because of the multitude of different points of view and of the constantly development of the research.

Clarity should be a priority in this context, because these learning problems affect individuals not only in terms of cognition, but they have a significant impact on their whole lives. In this direction, an important point that have been relatively recently considered is the emotional aspect of LD: it is crucial, in particular during school age, a period in which individuals build up their own identity.

The Italian law about learning disorders – DSA, in Italian – (Law 170/2010) started an increasing improvement of the attention given to these matter. Over these last years we have seen a growing awareness within learning problems in schools and universities. In addition, nowadays several compensatory instruments are easily available and technology provides effective tools for education. Several projects working in the field of learning problems provide effective aids to students, teachers and their families.

In this context, my concern is to organize and report definitions and explanatory models that can be helpful in focusing on the practical aspects of the research on learning disorders, without going into the details of the different theories and explanations.

The focus is on dyslexia, in particular in young and adult people.

I give particular consideration to the emotional aspects of learning disorders (emotional problems, i. e. anxiety) and to their impact in the life of the young adults, in particular on the construction of their self-concept.

I would like to avoid to draw up a list of famous people with dyslexia. It is well known that people like Albert Einstein, Walt Disney, Mozart (and many others...) succeeded in life, despite of their reading problems and a great deal of literature has been written about them. My concern is to refer to real problems that affect common

people, even if they don't hold the extra-ordinary compensatory talents of those who often are cited as "famous dyslexics". My purpose, throughout the entire study, is to focus on the concrete aspects of specific learning disorders.

The exploratory study analyses the presence of emotional difficulties in students attending high school and investigates their awareness of the problem, their requires and their knowledge about the available supporting tools, to which I give particular attention. Evidences deriving from the student's voices represent a crucial instrument for improving research and practice.

I would like to emphasize that in this work learning disabilities are treated not exclusively as cognitive disorders or disabilities, but also, in relation to the concept of neurodiversity, as cognitive characteristics.

Structure of the work

This work is divided into seven chapters. Chapter 1 builds up a "backbone" for LD, organizes the basic definitions and clarifies several terminological problems. Chapter 2 is about reading and writing and presents the main explanatory models for these processes. Chapter 3 presents the different levels of analysis on the research on LD, focusing on dyslexia. Chapter 4 is about adult dyslexia and LD. Chapter 5 describes the emotional problems deriving from LD, referring to previous researches. Chapter 6 presents the concept of neurodiversity and the main compensatory tools available to education. Finally, chapter 7 reports our exploratory study on a small sample of students with learning disorders.

At the beginning of the chapters, several questions are presented in order to focus on the main aspects of the analysis.

A note on the adopted terminology

In this study I refer to what in Italy are called DSA (Disturbi Specifici dell'Apprendimento) using predominantly the term "learning disorders" (or the abbreviation LD). In most of the cases I omitted "specific", for ease.

Despite that, in the first chapter I explain the differences between the different terminologies adopted in defining specific learning disorders. I ask you to refer to Chapter 1 for the details.

An accessible text

In order to make the text available for dyslexic people, I avoid using traditional fonts with serifs (that may confuse a dyslexic reader), choosing a standard, but more legible font.

The assessing tools (available in the *Appendix*) submitted to the subjects of our sample were written using Easy Reading, a commercial font specially designed for dyslexics.

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1. Learning disorders, a backbone

*I'm asked to read aloud in front of the class,
But the words swim before my eyes.
I start to sweat, I'm breathing fast;
The print I see I cannot recognize¹.*

It is difficult to focus on a definition for specific learning disorders (LD or DSA, in Italian), but it is important to find out a series of firm points that can be used as a “backbone” for the research. In this chapter we try to find out common characteristics that may help to clarify some basic points.

We refer in particular to the Italian Law 170/2010, that is crucial because it officially recognizes and defines these difficulties, providing a valid support tool for research and education.

At the end of the chapter, we report a series of clues that may help to hypothesize the presence of one or more learning disorders.

This section is focused on the following questions:

- *What do we mean with LD?*
- *What are the characteristics of LD?*
- *How can we identify the presence of one or more LD?*

1.1 Defining learning disorders

1.1.1 Something obscure

Among all the different approaches and frameworks in the research (cognitive, neuropsychological, genetic...) it is difficult to focus on a single definition. It is inevitable, because of the existence of a range of interpretations and levels of analysis. Researchers that refer to different theoretical frameworks have different purposes and priorities in defining and exploring the problem. Although, this lack of clarity is a limit, especially for who is directly involved.

¹ <http://www.dyslexiaassociation.ca/francais/questce.shtml>.

Molta gente nella sua vita ha sentito questa parola e tanti altri hanno scritto saggi e libri su di essa; alcuni la definiscono una malattia, altri un problema, altri ancora credono che sia la conseguenza di qualcosa di poco definito e oscuro, ma la realtà è che nessuno è in grado di definirla. (Cutrera, 2007)

The writer, Giacomo Cutrera, a young adult with dyslexia, at the beginning of his e-book - *Demone bianco* (White Demon), which is an account of the writer's life from childhood to adulthood - denounces the lack of clarity in defining the problem. In fact, he says, there isn't a definition at all. He observes that "someone [...] supposes that it is the consequence of something of not well defined and obscure, but in fact no one is able to define it".

It is important to define "LD", the term, used to cover a range of difficulties and to clarify some terminological problems.

Furthermore, clarity is important for researchers and for who works in the educational field.

For research, it is essential to be able to replicate a study. Since research in some of the cases used different operational definitions² and in other cases did not report on the assessment tools, it is not possible to replicate a study. [...] In some schools, students will be defined LD under one definition, while in other schools, they might not be defined as LD because of different operational definitions. (Reid and coll., 2008, p. 307)

Even if someone may notice that "the general term LD should be abandoned for more specific and productive sub-groupings" (Siegel and Lipka, in Reid et al., 2008, p. 307), the need to define the general category exists because this label is used in research, in education and in the legislation.

1.1.2 Learning disorders

The learning disorders examined refer to developmental (not acquired) problems in learning reading, writing and calculating in subjects without neurological diseases, sensory deficits or severe social or psychological problems.

They have neuro-biological/genetic causes that determine the peculiar

2 An operational definition indicates how a particular concept is measured.

characteristic of the learning processes.

Learning disorders can be diagnosed since the literacy period (7/8 years old) but may continue in adolescence and adulthood. They are formally defined on the basis of specific functional deficits and by official diagnostic criteria.

The definitions of learning disorders and the adopted terminology vary according to different classifications and in the different countries, but the common points are generally shared on the basis of international references.

1.2 Sources for the definition of LD

The definition of DSA has its foundation on specific criteria established by several institutions:

- **DSM-V**, the *Diagnostic and Statistical Manual of Mental Disorders*, edited by American Psychiatric association (APA). It offers standard criteria to identify “learning disorders”:
 - 315.0 Reading disorder
 - 315.1 Math disorder
 - 315.2 Writing disorder

They may present different degrees: mild, moderate and severe.

- **ICD 10**, the 10th revision of the *International Statistical Classification of Diseases and Related Health Problems* (ICD), a medical classification list by the World Health Organization (WHO). It contains the codes of the diseases and indicates signs and symptoms and other criteria useful to identify different problems.
Under “Specific developmental disorders of scholastic skills” (F81) this document identifies:
 - F81.0 Specific reading disorder
 - F81.1 Specific spelling disorder

- F81.2 Mathematics disorder
 - F81.8 Other developmental disorders of scholastic skills
 - F81.9 Developmental disorder of scholastic skills, unspecified
- **The Italian legislation:** the Italian law 170/2010 about “DSA” describes the “specific learning disorders” (in Italian “disturbi specifici del linguaggio”) identifying four subtypes:
 - *dislessia*
 - *disgrafia*
 - *disortografia*
 - *discalculia*
- **The Consensus Conference and the PARCC:** in 2006 the AID (*Associazione italiana Dislessia*) promoted the *Consensus Conference*. It, at the end of 2007, published some recommendations about the diagnosis and the treatment of DSA according to the DSM-V criteria. In the following years, the PARCC (*Panel di Aggiornamento e Revisione della Consensus Conference*) revisited and amplified the findings of the *Consensus Conference* and published its document in 2011.
- **Research:** the scientific research offers dynamic and specific descriptions of the learning problems that should be taken into account.

1.3 Law 170/2010: the Italian change and the definition of DSA

In the Italian context, we refer to the text of the Italian law 170/2010 about DSA. It is an important law that organizes and institutionalizes the specific learning disorders, paving the way to a more effective application of the rights for people with learning difficulties.

Art. 1 **Riconoscimento e definizione** di dislessia, disgrafia, disortografia e discalculia. (Law 170/2010, art. 1)

It is important to underline the terms “riconoscimento” (identification) and “definizione” (definition). Since the Law 170/2010 has been introduced, Italian schools have passed through important changes: the identification and the definition of the problem was a crucial step for teachers, families and students (it is a broad problem, the Italian Dyslexia Association, referring to the latest researches and investigations, estimates that in Italy there are around 1.500.000 people with learning disabilities, that is the 3.5 % of the Italian population).

Enrico Ghidoni (in Dettori, 2015) denounces the “long hibernation” of Italy through the years before officially recognizing the existence of DSA.

It has been since the introduction of this law that new researches about learning disabilities have been frequently published in Italy.

Nella seconda metà degli anni '90 i libri italiani che parlavano di dislessia si contavano sulle dita di una mano, ora non passa mese che non esca qualche nuovo testo, che affronta aspetti sempre nuovi della problematica. (Dettori, 2015, p. 7)

The significant increase in the number of studies in the Italian scenario represents the key to introduce new supporting instruments for people with DSA.

1. La presente legge riconosce la dislessia, la disgrafia, la disortografia e la discalculia quali disturbi specifici di apprendimento, di seguito denominati «DSA», che si manifestano in presenza di capacità cognitive adeguate, in assenza di patologie neurologiche e di deficit sensoriali, ma possono costituire una limitazione importante per alcune attività della vita quotidiana. (Law 170/2010, art. 1)

First, the label “DSA”, in the text of the Italian law, comprehends four subtypes:

- *dislessia* (dyslexia)
- *disgrafia* (dysgraphia)
- *disortografia* (dysortography)
- discalculia (dyscalculia)

They are difficulties in learning to read, write and to use numbers respectively.

They are *specific* learning diseases. “Specific” means that they affect the domains of reading, writing and calculating.

They are developmental, regarding the *learning* process (and not acquired), that is that they are present in an individual for intrinsic factors that condition the learning processes during the life course, and they are not caused by an external event which occurred at a certain moment, for example a trauma (as it happens in people with aphasia or surface dyslexia, that are acquired diseases).

The article underlines that these problems can be diagnosed people with normal cognitive abilities, without neurological diseases or specific sensory deficits.

Although, the learning disorders affect the life of people, in particular in a cultural system in which reading and writing have a crucial role.

1.4 “DSA”, subtypes

In this section, the four subtypes of “DSA” are presented, referring to the classification used in the Italian context. I refer in particular to the Italian law about DSA and to the document of the Consensus Conference and the PARRC.

1.5.1 Dyslexia

Dyslexia is a disorder that causes difficulties in reading (in terms of speed and accuracy). In dyslexia the reading process isn't automate.

Ai fini della presente legge, si intende per dislessia un disturbo specifico che si manifesta con una difficoltà nell'imparare a leggere, in particolare nella decifrazione dei segni linguistici, ovvero nella correttezza e nella rapidità della lettura. (Law 170/2010, Art. 1)

1.4.2 Dysgraphia

Dysgraphia is a disorder that causes difficulties in reproducing alphabetic and numeric symbols. It affects the graphical representation and not the orthography of

words.

Ai fini della presente legge, si intende per disgrafia un disturbo specifico di scrittura che si manifesta in difficoltà nella realizzazione grafica. (Law 170/2010, Art. 1)

1.4.3 Dysortography

Dysortography refers to a disorder that concerns the linguistic aspect of writing (rules).

Ai fini della presente legge, si intende per disortografia un disturbo specifico di scrittura che si manifesta in difficoltà nei processi linguistici di trascodifica. (Law 170/2010, Art. 1)

1.4.4 Dyscalculia

Dyscalculia causes problems in manipulating, calculating, and memorizing numbers and in the resolution of arithmetic tasks.

Ai fini della presente legge, si intende per discalculia un disturbo specifico che si manifesta con una difficoltà negli automatismi del calcolo e dell'elaborazione dei numeri. (Law 170/2010, Art. 1)

1.5 General diagnostic criteria and comorbidity

1.5.1 Diagnostic criteria

A correct and early diagnosis of the learning disorders is important.

DSM-V defines the criteria for a correct diagnosis on the basis of the following general criteria:

- observable and persistent (> 6 months) problems on academical skills for the different processes involved (problems in reading, writing and math);
- the abilities are significantly low according to the subject's age and to the school education;

- the problems may get worse when the required tasks become more complex (deficit of automation);
- absence of neurological diseases or sensory deficits that may be the cause of the problems;
- absence of consistent social disadvantages and severe psychological problems.

Another criterion used to identify the presence of one or more DSA is the achievement (this is the discrepancy parameter). It refers to the skills taught at school: following the ICD 10, for a LD diagnosis, the level of the performance of a subject must be significantly lower (lower than 11 standard deviation) than the level of children matched for age and IQ without learning problems.

Learning disorders affect people with normal cognitive abilities (IQ ≥ 85)

The documents agree in recommending to prefer other criteria rather than the IQ scores. It is generally assumed that children (and adults) with specific learning disorders don't present cognitive problems in terms of IQ, instead, they present average or above average levels of IQ.

1.5.2 Comorbidity

With “comorbidity”, in medicine, we refer to the presence of one or more additional disorders (or diseases) co-occurring with a primary problem.

In a subject we may observe one or more learning disorders.

Learning disorders, furthermore, may coexist with other developmental problems (i. e.: specific language disorder; motor coordination problems and attention problems, as ADHD, the Attention Deficit Hyperactivity Disorder).

1.6 Disorder or disability?

It is important to clarify some terminological discrepancies.

- In the Italian “DSA”, D stands for “disturbo” (I translated it with disorder).
- The D, in the American “LD” officially stands for “disability”.

To describe this terminological heterogeneity (it may be confusing) it is useful to look at the clarifications proposed by the document of the PARCC (2011):

Il termine *disturbo* con riferimento alle difficoltà di apprendimento compare nei sistemi di classificazione dei Disturbi Mentali DSM e ICD; [...] Il termine disturbo compare nelle relazioni cliniche con l'obiettivo di facilitare l'attivazione di aiuti adeguati allo sviluppo - es.: permettere la applicazione di strumenti didattici compensativi e dispensativi. nelle stesse relazioni dovrebbe comparire anche il termine caratteristica per favorire nell'individuo, nella sua famiglia e negli insegnanti una rappresentazione non stigmatizzante della difficoltà di apprendimento.

Il termine *disabilità* riferito alle difficoltà di apprendimento ha uno scopo etico di protezione sociale; è utile quando viene utilizzato per rivendicare un diritto a Pari Opportunità nella istruzione; quella della disabilità è, infatti, una relazione sociale, non una condizione soggettiva della persona.

The term *disturbo* (disorder) defines a problem of an individual. It is utilized in the medical context, for example in the diagnostic manuals. This term was used by Kirk (Kirk, 1962), who provided one of the first formal definition.

The term *disability* doesn't describe a subjective characteristic, but a social relation. It pertains to a social context, in which the individual needs specific support to improve his quality of life and to overcome the social barriers (it is used for example in the DSM: Diagnostic Statistical Manual of Mental Disorders, American Psychiatric Association). For an individual with LD it is important to ensure autonomy and opportunities for his life and carrier.

1.7 Differences, characteristics and difficulties

The formal diagnostic criteria are important, but we should consider people with learning problems in the context of inter-individual variability (LD as differences) and we should observe their weak and their strong points in order to find what may be the most effective support. The organic structure of the brain determines a variety of

learning styles (LD as characteristics) that should be taken into account.

The definition of the British Dyslexia Association (BDA) consider LD as *difficulties*:

Specific Learning Difficulties (or Sp LDs), affect the way information is learned and processed. They are neurological (rather than psychological), usually run in families and occur independently of intelligence. They can have significant impact on education and learning and on the acquisition of literacy skills³.

Nevertheless, here is an important difference between *disorder* and *difficulty* that should be highlighted:

DISORDER/DISABILITY	DIFFICULTY
Innate Resistant to interventions Resistant to automation	It isn't innate May be mitigate by specific interventions It allows automation

Ianes, Lucangeli and Mammarella 2013, p. 22

(In Dettori, 2015, p. 24.)

1.8 Highlight: the role of the cultural context

All the presented problems pertain to the domain of reading and writing.

“Reading is a skill that is highly valued by society and in most communities holds the key of education” (Snowling, 2000, p.1).

Pollak (Pollak, 2009), in a study introduces the fact that, if we lived in a society in which reading and writing doesn't have such an important role, the impact of these difficulties wouldn't be so crucial.

3 <http://www.bdadyslexia.org.uk/educator/what-are-specific-learning-difficulties>

1.9 How can we identify learning disorders?

There are several clues that should be considered if we suspect the presence of a learning disorder. In this section the different difficulties are divided in the different domains (reading, writing, calculating) that can be affected by one or more DSA.

I indicated also a number of non-linguistic characteristics that may be observed.

1.9.1 Reading

It is difficult to give an example of what dyslexia in fact is because it is difficult to report the reading competence of an individual.

In the following example, I report a list of words (in the left column) and the reading performance of a child (attending the 5th year of the primary school):

<i>zingaro</i>	<i>zigniario</i>
<i>uscio</i>	<i>uschio</i>
<i>scimmia</i>	<i>schimmia</i>
<i>chirurgo</i>	<i>cirurgo</i>
<i>giglio</i>	<i>gioglio</i>
<i>foglia</i>	<i>foglio</i>
<i>globulo</i>	<i>ghiodulo</i>
<i>denuncia</i>	<i>bennucchia</i>

Source: Biancardi & Milano, 1999

- Difficulties in the identification of the letters (grapheme to phoneme conversion);
- difficulties in the identification of letters that are graphically similar (i.e.: m-n, b-d, q-p, a-e);
- confusion in reading letters that are phonetically related (t-d, f-v, p-b...);
- inversions, omissions and additions of letters (i.e.: “introno” in state of “intorno”);
- slow reading.
- at the beginning of a text, the children/boy may read a word correctly, but then

he commits mistakes;

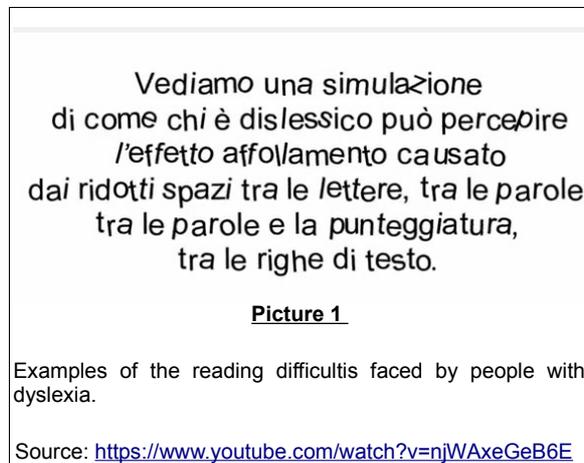
- the reader tries to hypothesize words, i. e.:

*Ma i contributi previdenziali
nessuno glieli versa, se
dovesse ammalarsi non
avrebbe l'assistenza sanitaria.*

*Mai contributi sanitari nascono
glieli versa, se doveva
ammalarsi non avrebbe la
sistemazione.*

Source: Biancardi & Milano, 1999

- omissions of lines or words in reading;
- the subject reads separating the words into syllables.



1.9.2 Writing (disgraphia)

il livello ha parlato in classe e scritto di questi
danni signi ne contiene? (ANTI SONO I TUTTI I GIORNI)
DI ANCHE DI IPOTESI DI POSIZIONE DE LA CLASSE?

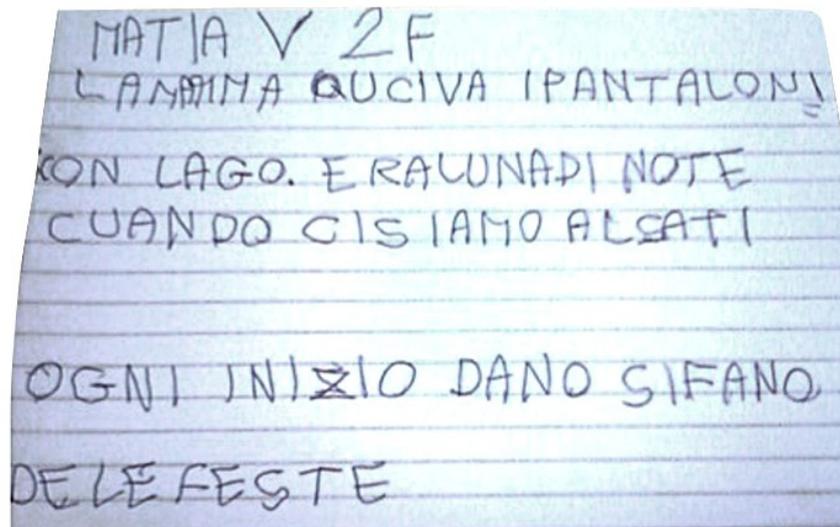
Picture 2

Example of dysgraphia

Source: <http://www.aiditalia.org/>

- the children/boy presents a graphic trait that is difficult to read, both to an external reader and to the writer himself;
- difficulties in using cursive;
- difficulty in using the space of the paper;
- anomalies in writing speed.

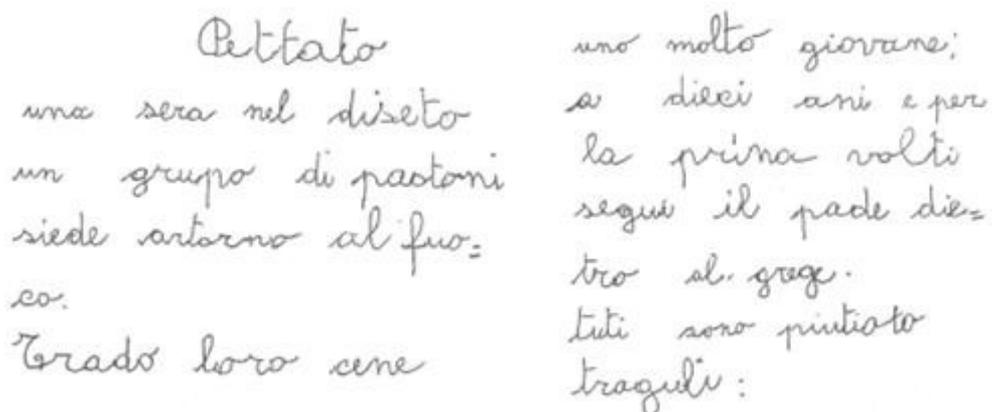
1.9.3 Writing (dysortography)



Picture 3

An example of dysortography

Source: <http://www.aiditalia.org/>



Picture 4

Example of dysortography

Source: Biancardi and Milano, 1999

- Swap of letters that are similar in form (m-n, b-d-q-p, a-e) or in the correspondent sound (t-d, f-v, p-b...);
- reductions (“pota” instead of “porta”);
- illegal fusions or separations (“lape” in place of “l’ape”);
- omissions and additions of letters, syllables or parts of words (“tvolò” instead of “tavolo”);
- mistakes in the transcription processes (for example from blackboard or a book to another writing support);

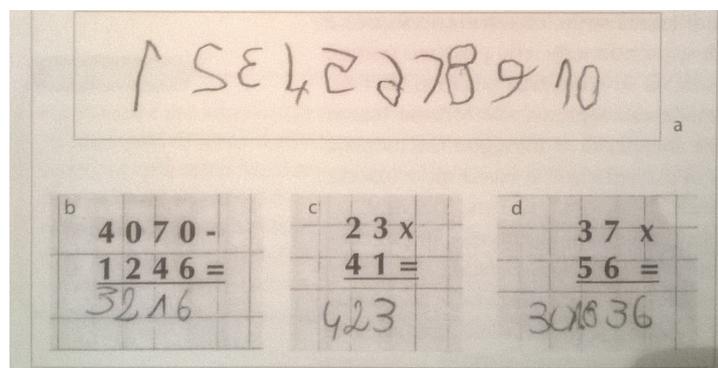
1.9.4 Calculating

$\begin{array}{r} 34 \times \\ \underline{2} = \\ 36 \end{array}$	$\begin{array}{r} 27 \times \\ \underline{15} = \\ 55 \end{array}$	$\begin{array}{r} 27 \times \\ \underline{3} = \\ 621 \end{array}$	$\begin{array}{r} 322 - \\ \underline{36} = \\ 314 \end{array}$
$\begin{array}{r} 112 - \\ \underline{18} = \\ 106 \end{array}$	$\begin{array}{r} 2377 - \\ \underline{107} = \\ 2200 \end{array}$	$\begin{array}{r} 46 + \\ \underline{7} = \\ 322 \end{array}$	$\begin{array}{r} 327 + \\ \underline{43} = \\ 389 \end{array}$
$\begin{array}{r} 225 : 5 = 50 \\ 22 \\ \underline{2} \end{array}$		$\begin{array}{r} 1206 : 4 = 31 \\ 006 \\ \underline{2} \end{array}$	

Picture 5

Example of problems in dyscalculia

Source: <http://www.aiditalia.org/>



Picture 6

Written numbers in discalculia; calculating problems

Source: Stella, 2011, p. 12.

- Difficulties in writing numbers and in recognizing arithmetic symbols;
- difficulties in enumeration;
- problems in counting decades;
- omissions of numbers;
- difficulties in the recollection of results of simple operations;
- difficulties in the multiplication tables;
- problems in calculations (for example in organizing calculations in columns or expressions);
- problems in the organization of the writing space;
- difficulties in the resolutions of problems.

1.9.5 Other difficulties related to LD

- Difficulties in distinguish between left and right;
- difficulties in memorizing and recollecting simple sequences (for example: week days, months, seasons, the alphabet). This difficulties may cause problems in the use of instruments as a dictionary;
- problems in the expressions of time;
- problems in reading the analogical clock;
- difficulties in short term memory tasks;
- general difficulties in memorizing items;
- difficulties in the orientation;
- difficulties in several motor tasks.

Summary

It is difficult to find out a clear definition of learning disorder, but it is important to recognize common points that can be used as a basis in the research:

- *With LD (or DSA, in the Italian context) we refer to different subtypes of specific problems in learning to reading, writing and calculate;*
- *LD occur in subjects without other psychological, neurological or sensory deficits;*

- *The “D” of DSA, LD and Sp Lds can be interpreted as disorder or as disability. It may be also translated with difficulty or difference. These terms have different meaning in different contexts. Considering the concept of difference is important.*

2. Reading and writing

Leggere e scrivere sono considerati atti così semplici e automatici che risulta difficile comprendere la fatica di un bambino dislessico⁴.

In evolutionary terms, (...) written language is a relatively new acquisition. Writing systems evolved as ways of representing spoken words in a more permanent form for the purposes of communication across time and place. (Snowling, 2000, p.1).

In studying learning difficulties, it is essential to introduce reading and writing. Both these abilities depend on several cognitive processes, for which researchers proposed different explanations. Here we report only the theories that are considered more influential in the wide theoretical framework.

This chapter tries to answer to the following questions:

- *What are the cognitive abilities that are related to reading and writing and what brain areas are involved in these processes?*
- *What explanation of reading offers the influential dual route model (Coltheart, 1978)?*
- *How do we learn reading and writing?*

2.1. Reading ability

[...] si intende per dislessia un disturbo specifico che si manifesta con una difficoltà nell'imparare a leggere, in particolare nella decifrazione dei segni linguistici, ovvero nella correttezza e nella rapidità della lettura (Law 170/2010, art.1).

To describe dyslexia, it is indispensable to introduce reading. In the following pages I report two models of reading: a model that is useful to identify the reading

4 http://www.aiditalia.org/it/cosa_e_la_dislessia.html#introduzione

processes, knowledge and skills (Vellutino et al., 2004) and the *Dual Route Model* (we refer in particular to Coltheart 1987), which describes a theory for reading aloud.

2.1.1 Components of reading ability (Vellutino's model)

Reading ability is founded on a series of cognitive processes, skills and knowledge. Vellutino “presents a model that depicts the cognitive processes and the different types of knowledge involved in learning to read” (Vellutino et al., 2004, p. 3):

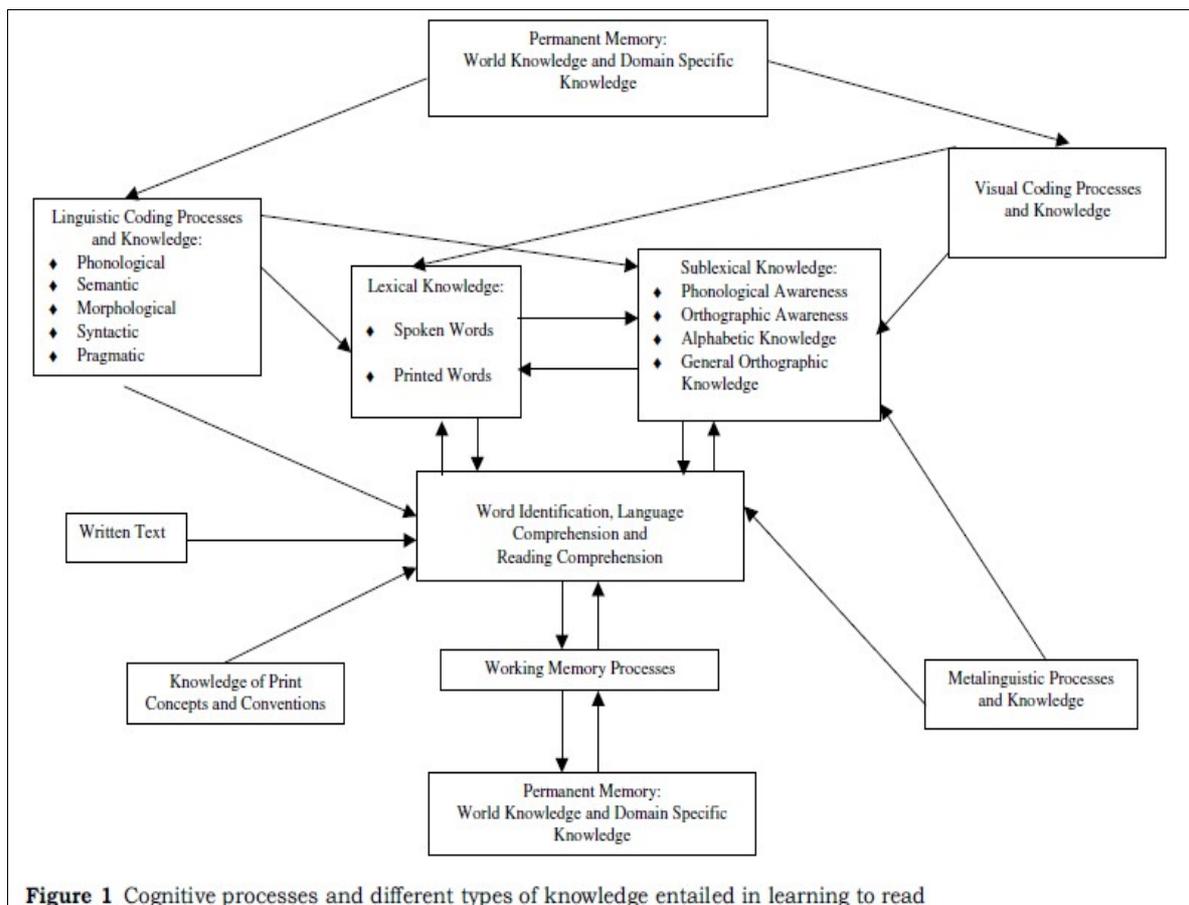


Figure 1 Cognitive processes and different types of knowledge entailed in learning to read

Picture 7

The Vellutino's model of reading processes and skills

Source: Vellutino et al., 2004

2.1.1.1 Visual and linguistic coding processes

Visual and linguistic components together permit all the associations between spoken language and its written form (according to the criteria provided for by the rules of the different languages).

- Visual coding processes: “refer to sensory and higher-level visualization processes”⁵ which permit to visualize and to elaborate linguistic symbols.
- Linguistic coding processes and knowledge (phonological, semantic, morphological, syntactic and pragmatic): “refer to processes that facilitate language acquisition and the use of language for coding, storing and retrieving information”⁶.

2.1.1.2 Linguistic competence in reading

Linguistic competence (proficiency) in reading is the ability in recognizing and elaborating the linguistic symbols and the linguistic components. It requires several abilities:

- meta-linguistic analysis: it refers to the explicit knowledge of the mechanisms and rules of language. This facilitates the acquisition of:
- sublexical knowledge: it pertains to the letter level, it is in particular the phonological and orthographic awareness, the alphabetic knowledge and the general orthographic knowledge.
 - Phonological awareness refers to competence in segmenting words into their “individual speech sounds”⁷ (phonemes) and combinations of sounds (syllables) and to elaborate all these elements.
 - Orthographic awareness refers to the knowledge of the organization of written words.
- Lexical knowledge: it is related to words in their whole form and to the

5 Ivi, p. 4

6 Ibid.

7 Ivi, p. 5.

knowledge of the lexicon.

- Syntactic awareness: it refers to the ability to recognize phrases and to detect mistakes.

2.1.1.3 Memory processes

In the analysis of the reading processes, we must include memory processes.

If we refer to the Ullman's model (Ullman, 2004) we assume the existence of different memory systems:

- **Declarative memory systems:**

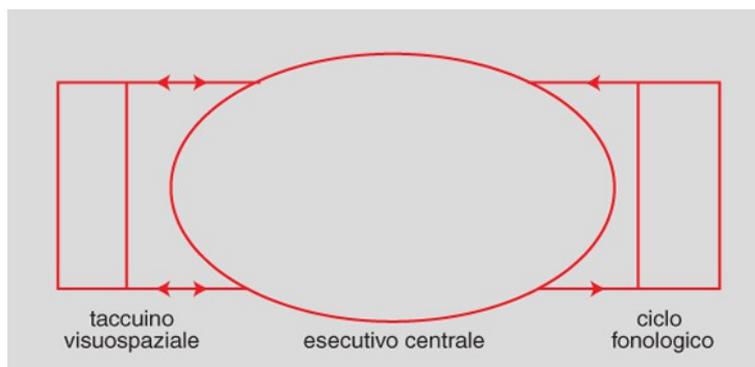
The “declarative” memory system has been implicated in the learning, representation, and use of knowledge about facts (“semantic knowledge”) and events (“episodic knowledge”). (Ullman, 2004, p. 235)

- **Non declarative memory systems:**

The “procedural memory” system subserves the learning of new, and the control of established, sensori-motor and cognitive “habits”, “skills”, and other procedures, such as riding a bicycle and skilled game playing. (Ullman 2004, p. 237)

We should take into account working memory.

- **Working memory** (Baddeley and Hitch, 1974 and Baddeley, 1992 and 2002): it is a dynamic system used for temporarily storing and manipulating information.

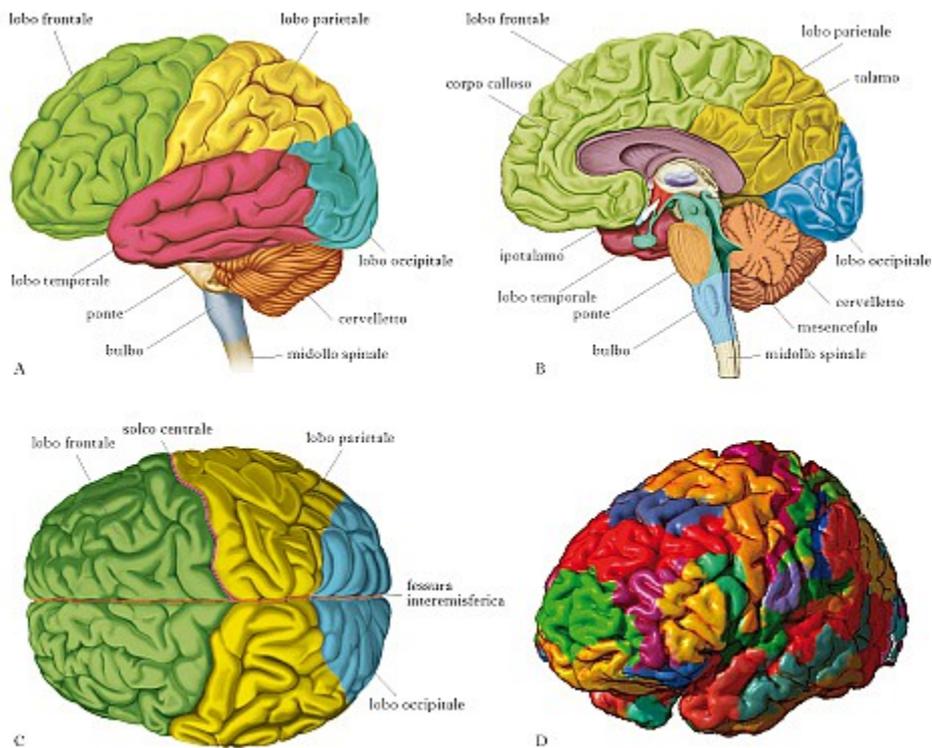


Picture 8

Source: www.treccani.it

Working memory processes. The *central executive* is a system that controls the cognitive processes of working memory, according to the different situations. The *phonologica loop* deals with the sounds (acoustic traces). The *visuospatial sketchpad* deals with the storage of the visual information and of the mental images. Furthermore, Baddeley (2002) introduced the *episodic buffer*, a system that manages the whole information.

2.1.2 Brain structures involved in the reading process

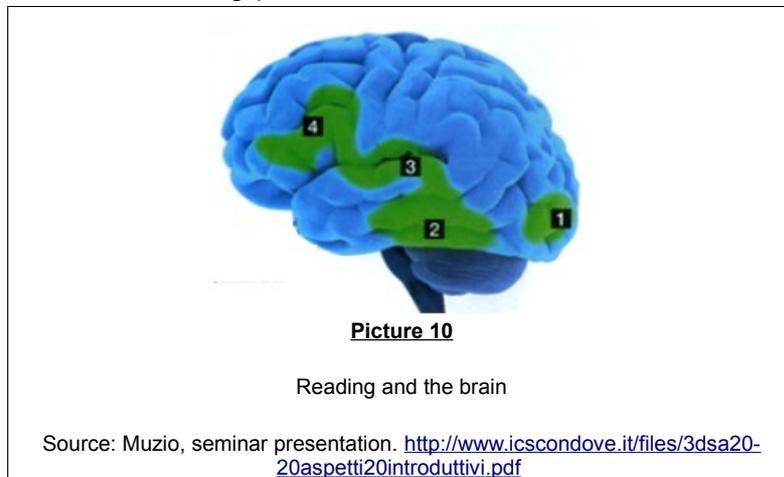


Picture 9

Brain's areas

Source: [http://www.treccani.it/enciclopedia/struttura-e-funzione-del-cervello_\(Dizionario-di-Medicina\)/](http://www.treccani.it/enciclopedia/struttura-e-funzione-del-cervello_(Dizionario-di-Medicina)/)

Given the whole structure of the brain, the specific linguistic functions are localized on the left hemisphere. For reading, we focus on the following areas (1, 2, 3, 4) highlighted in the following picture:

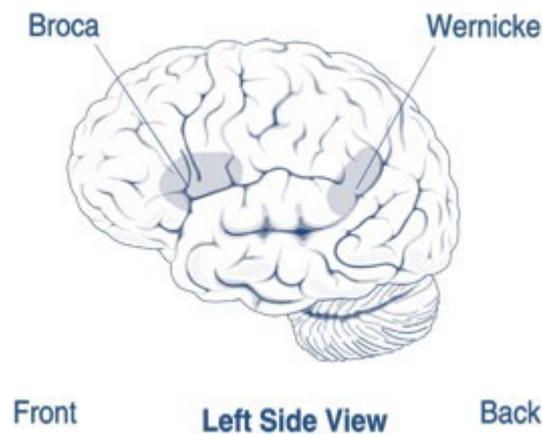


Picture 10

Reading and the brain

Source: Muzio, seminar presentation. <http://www.icsccondove.it/files/3dsa20-20aspetti20introduttivi.pdf>

1. Occipital lobe: combining visual analysis of symbols.
2. Temporal lobe: storage of the orthographic representation of words. The recognition of words takes place in this area. Memory systems are situated in this area of the brain.
3. Wernicke's area: auditory images of words (Brodmann's areas 44, 45).
4. Broca's area: motor areas for pronouncing words (Brodmann's area 22).



Picture 11

Broca's and Wernicke's areas

Source:

<http://www.nidcd.nih.gov/health/voice/pages/aphasia.aspx>

2.1.3 The dual route model for reading aloud (Coltheart 1978)

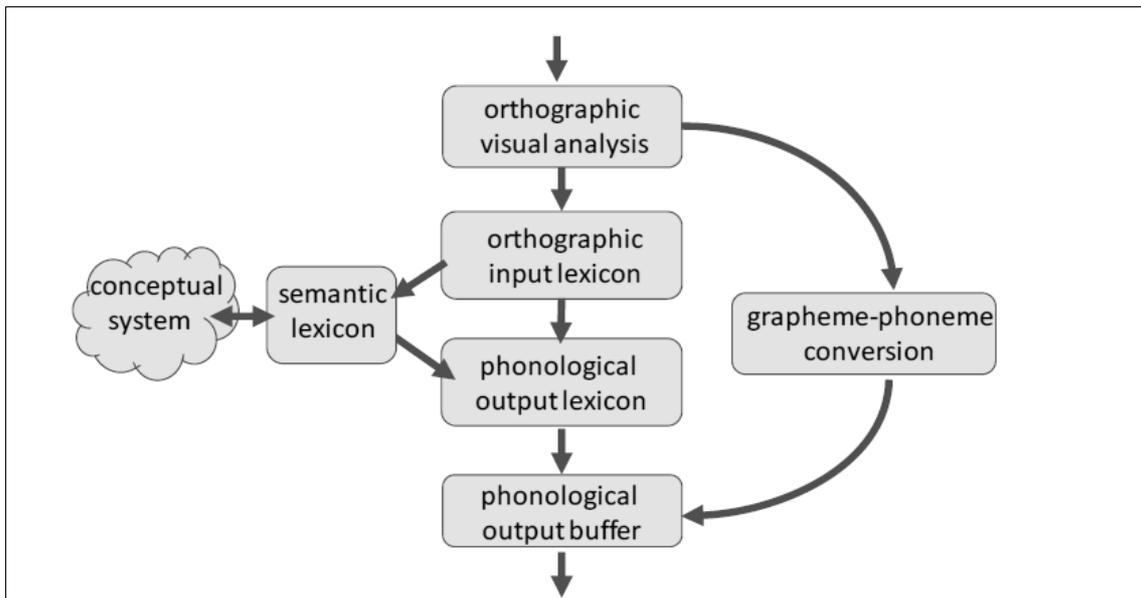
Different models that analyze the reading process in serial cognitive operations were developed in the context of the modular conception of the cognitive functions.

According to the *Dual Route Model* (Coltheart, 1978)⁸, in reading we can use two ways: the *sublexical route* and the *lexical route*. The two ways are independent, but each one is indispensable.

The *sublexical route* is build up by cognitive structures (the orthographic visual analyzer and the orthographic input lexicon) that permit to break a word into its components. In this process it is possible to pronounce the word (via the phonological output lexicon and the phonological output buffer) by the grapheme - phoneme conversion process and to obtain the meaning of the words. It is used especially in reading non-words or words of which the reader doesn't know the meaning.

The *lexical route* pertains to skilled readers. For a reader it is possible, via the orthographic lexicon and the research in the phonological lexicon, to perceive a written word recognizing it as a whole. This process includes the semantic lexicon, connected to the conceptual system. In this process the lexical memory of words is an important factor. This process requires: a mental “dictionary” which contains the orthographic representations of the letters and a mental “dictionary” for the phonological representation of words. A good process of reading requires the short term memory (STM) storage for the associations between graphical representations and phonological forms and the long term memory (LTM) storage for the associations word – meaning, organized in the semantic lexicon.

8 This model was developed to study the acquired dyslexia in adulthood.



Picture 12

The dual route model of reading

Source: <http://www.tau.ac.il/~naamafr/>

Here a practical example of *sublexical* and *lexical* way in reading:

<p>SUBLEXICAL ROUTE Non words (or new words):</p> <p>Lapido munato bacuto miotra notole ecchIU lapiro quodre amizio gamapi falaso tigomo nivaba barloma giagna dagumi buglia strova defito fromopu irrole scorpi pilcone tifola beniro enchea vostia fucido avelli vicepo chiore digato</p>	<p>LEXICAL ROUTE Well known words reading as wholes:</p> <p>Socdno una riccrea dlel'Unvrsetiia di Carbmddie l'oidrne dlele lertete all'iternno diuna praloa non ha imprtzaona a ptatp che la pimra e l'ulimta saino nlllea gusita psoizoine. Anhce se le ltteere snoo msese a csao una peonrsa puo leggere l'inetra fasre sneza poblremi. Cio e dovuto al ftato che il nstoro celverlo non lgege ongi sigonla leterta ma tiene in cosinaderzione la prolaa nel suo inesime</p>
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Source: AID Italia

2.1.4 Learning to read: the Uta Frith's model of learning to read

In 1985, Uta Frith, an English developmental psychologist, developed her model of learning to read. This work tries to explain the development of the various components of the reading and writing processes:

In Frith's model, a child passes through different stages.

In the *logographic stage* the child perceives familiar words as single units (as “gestalten”), recognizing their graphical structure; in the *alphabetic stage* (at the beginning of primary school) the child is able to decode a word into its single letters and uses the grapheme - phoneme conversion rules; in the *ortographic* stage the child (7 years old) segments words into groups of letter (“orthographically standard chunks”⁹) and understands and applies the orthographic rules of his language.

The skilled reader recognizes and reads words in their global form and uses his personal lexicon (with the exception of unknown words or new words from other languages). Reading gradually becomes an automatic process.

2.2 The writing process

Reading and writing are strictly connected. Writing ability requires, in addition to linguistic abilities, other cognitive and motor abilities.

2.2.1 Underneath handwriting

Writing ability requires a series of components and abilities in addition to the

- linguistic competences

Handwriting requires:

- Visual perception
- spatial organization
- temporal organization

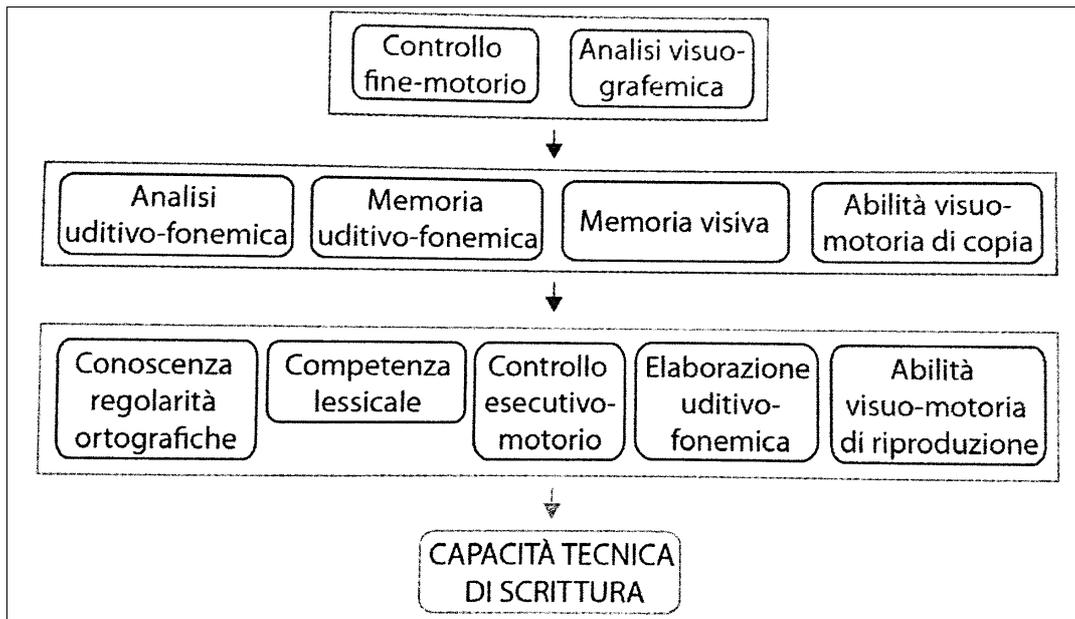
9 Nicolson and Fawcett, 2010, p. 46.

- integration of spatial and temporal information
- ability to distinguish between left and right
- awareness of the body schema
- motor coordination
- lateral dominance
- memory processes and
- attention

2.2.2 Learning to write (Ferreiro e Toberosky, 1985)

Ferreiro e Toberosky (1985), observing the children's drawings and the descriptions they gave of their paintings, identified four stages in learning to write (*pre-conventional, conventional syllabic, conventional syllabic-alphabetical, conventional alphabetical*). The acquisition of writing competence passes through these levels, from the motor competence (using writing to imitate written words, without knowing the linguistic rules) to the orthographic and lexical competence.

The development of the writing process, that begins when a child starts to attend the primary school, is well schematize here:



Picture 13

Synopsis of the writing process

Source: Stella and Grandi, 2011, p. 93.

Summary

Reading and writing lay on several cognitive abilities and neurological structures. Reading is made possible by visual and cognitive processes (linguistic and memory processes). The Dual route model is the most influential model for the explanation of reading. Writing requires several cognitive abilities and, in addition to the visual and cognitive abilities, it requires good motor coordination. These process gradually become automatic in children in the course of the literacy period.

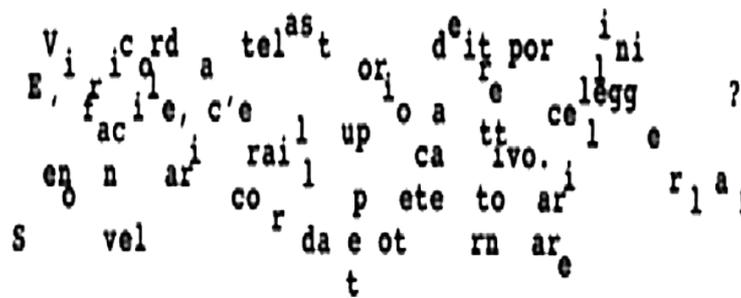
3. Dyslexia, possible explanations of developmental dyslexia

Ancay ouyay eakspay igpay atinlay?¹⁰

Pig Latin is a linguistic game in which words in English are altered according to a simple set of rules. The objective of the game is to create strange and foreign-sounding words, concealing the meaning of the words from others who are not familiar with the rules. This is an example of a simple operation that is crucial for reading: the manipulation of phonemes, that pertains to the phonological competence. Phonological competence has been described to be impaired in dyslexia, but several other explanations have been proposed since the first formal descriptions of this reading disease. It is impossible to give an exhaustive analysis of all the theories, but we try to present the most influential, in order to delineate a framework which can be used as a base for research and practice.

This chapter tries to answer to the following questions:

- *What is developmental dyslexia?*
- *What hypothesis were postulated to explain dyslexia?*
- *What are the underlying causes of this reading disease?*



**Vi ricordate la storia dei tre porcellini?
E' facile, c'era il lupo cattivo.
Se non ve la ricordate, potete tornare a
rileggerla!**

Picture 14

Letters floating in dyslexia

Source: <http://www.aiditalia.org/>

¹⁰ <http://www.donnelly-house.net/funcrec/piglatin/>

3.1 “A bright and intelligent boy, quick at games, and in no way inferior to others of his age”

Dyslexia was firstly systematically described in 1896 by James Kerr and W.M. Morgan in an article published in *The British Medical Journal*. The title of the article was: “A case of congenital word blindness”.

Morgan described a case of a 14-year-old boy, whose name was Percy F.. He described the boy in these terms:

[a] bright and intelligent boy, quick at games, and in no way inferior to others of his age.

(...) His great difficulty has been – and is now – his ability to learn to read. The inability is so remarkable, and so pronounced, that I have no doubt it is due to some congenital defect.

(...) He has been at school or under tutors since he was 7 years old, and the greatest efforts have been made to teach him to read, but, in spite of this laborious and persistent training, he can only with difficulty spell out words of one syllable.

In the early 1900s, those who investigated these problems (generally they were medical specialists) assumed that these difficulties with reading and writing were due to a form of “congenital word blindness” (Snowling, 2000, p. 14). In the following years, the definition of dyslexia and the research on reading disorders got out of the medical “monopoly”.

3.2 Cognitive Level explanations

The cognitive level provides a valuable descriptive level between brain and behavior. Cognitive psychologists have developed a range of techniques for describing the sort of processes and conceptual structures that are involved in everyday information processing task. A big advantage of a cognitive-level description is that it is intelligible to us, and may also directly suggest appropriate support methods (Nicolson and Fawcett, 2010, p.21).

3.2.1 The phonological deficit hypothesis

“The phonological deficit hypothesis has been the dominant explanatory

framework for dyslexia”¹¹ this theory was developed in the USA by Frank Vellutino in 1979. Vellutino described dyslexia as a language difficulty rather than a visual deficit (it was the general belief in those years).

The hypothesis takes into account the phonological awareness - that is a meta-linguistic skill - in particular the knowledge of the sounds that makes up words.

The phonological awareness comprehends

- the syllabic knowledge, that is the competence in recognizing syllables, and
- the phonemic knowledge: it can be defined as the complex meta-linguistic ability to recognize and elaborate the linguistics sounds (phonemes): “to count phonemes, divide words into a series of phonemes, delete phonemes, and substitute phonemes”.¹²

A phonological deficit is also connected to working memory problems.

The observable signs of phonemic impairments in dyslexic subject (children and adults) are the following (described by Høien and Lundberg in *Dyslexia: From Theory to Intervention*, 2001):

Problems in segmenting words into phonemes, problems in keeping linguistic material [...] in short term memory, problems in repeating back long non-words, problems in reading and writing even short non-words, slow naming of colors, numbers, letters and object in pictures, a slower rate of speech [...], problems in playing word games where the point is to manipulate phonemes (games like Pig Latin)” (Høien and Lundberg, 2001, p.84).

3.2.2 Highlight: Dyslexia in different orthographies

Dyslexia is not language independent. Referring to the phonological deficit hypothesis, we assume that dyslexia varies across languages. “One of the main features that may determine the manifestation of dyslexia across languages is variability in orthography” (Everatt and Elbeheri, in Reid et al., 2008, p. 428).

Languages can be distinguished considering their orthographic transparency. In some orthographies the relationship between the written symbols and the language

11 Ibid.

12 Ivi, p. 24.

sounds is simple: “There is close one to one correspondence between the written symbol (grapheme) and the basic sound (or phoneme) that it represents” (Everatt and Elbeheri, 2008, p. 428). These are called transparent orthographies (i.e.: Italian, Hungarian). Other languages are less transparent in this relationship: “a letter may represent several sounds, and a particular sound may be represented by different letters, depending on the context within which the letter or sound is presented¹³”. The best example is English.

Studies on the relationship between language transparency and language learning (Everatt et al. 2002; Seymour et al. 2003) suggest that there are few problems in learning a more transparent language. Dyslexia at a word-level literacy learning difficulty may be less evident in people learning a transparent orthography.

“A dyslexic child might be able to rely on relatively simple grapheme – phoneme association rules to support decoding and use these from an earlier age than their counterparts learning a less transparent orthography”¹⁴. “Indeed, given the reciprocal relationship between literacy learning and phonological skills (Morais et al., 1979; Lukatela et al., 1995)¹⁵”, learning a more transparent language may help in competence.

However, in a dyslexic child (or adult) who reads a transparent orthography there may be problems in reading speed rather than in accuracy (Lenderl, 1997, studies of German dyslexics).

3.3.3 The Double Deficit Hypothesis

It has been demonstrated by studies on the naming speed ability that the lack of speed in reading (fluency) is a characteristic of dyslexic subjects (Denckla & Rudel, 1976; Yap & Van der Lelij, 1993).

According to Wolf and Bowers (1999), the phonological deficit and the naming speed deficit represent two reading dysfunctions in subjects with dyslexia.

In Wolf's analysis three types of “poor readers” are described: subjects with

13 Ibid.

14 Ivi, p. 431

15 Ibid.

phonological deficit, subjects with speed deficit and subjects that present phonological and speed deficits. The latter group may be the most impaired.

This analysis enlarged the importance of fluency in the dyslexia studies.

The *Double deficit* theory modified the points of view in remediation. Introducing the role of fluency in reading competence, it reserve more importance to this factor in learning to read and in improving the competences of dyslexic students.

The relationship between working memory, processing speed and verbal ability is described by Demetriou and colleagues (2002).

3.3 Learning disability

Dyslexia is classified as a *learning* disorder or disability, it is therefore necessary to describe the problems in the learning processes of dyslexic people.

3.3.1 Dyslexia as a deficit in the procedural learning system

Learning to read requires the acquisition and the development of complex cognitive skills. Nicolson and Fawcett (1990) described the *Automatization Deficit Hypothesis*. According to this theory, dyslexic subjects present deficits in automatic skills, not only linguistic skills, but also motor skills. In a series of tests they observed phonological skills, working memory skills, information processing speed and motor skills in a group of dyslexic children.

They connect the difficulty on learning to read to a general difficulty in the automatized processes. According to their analysis, the deficit is localized in the procedural learning system. “The hypothesis accounts neatly for the problems in acquiring phonological skills, in reading, in spelling and in handwriting” (Nicolson and Fawcett, 2010, p.29).

3.4 Brain level

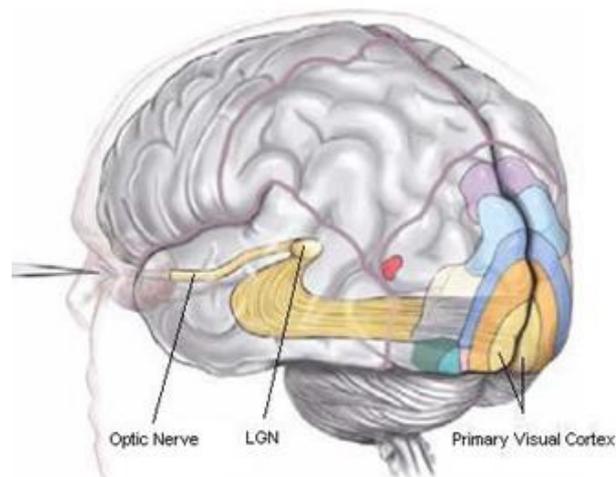
“This approach investigates differences in brain structures or brain activation patterns” (Nicholson and Fawcett 2011, p.30).

3.4.1 Magnocellular Deficit Hypotheses (visual and auditory)

This hypotheses (Lovegrove, 1990; Livingstone et al., 1991; Eden et al., 1996; Stein and Walsh, 1997) assume that people with learning disabilities present abnormalities in the way information is transmitted by the pathways for the sensory nerves.

In both visual and auditory modalities, it has been discovered relatively recently that there are two types of pathways, magnocellular and parvocellular. The magnocells (which are big, hence their name) were originally thought to transmit visual and auditory information quickly, whereas the parvocells were more important for detail.

If a tiger emerges to one's left, the magnocells shout: “large animal-attend left!”; the head turns, the parvocells indicate “tiger”, and the legs start running. (Nicholson and Fawcett, 2010, p.32)

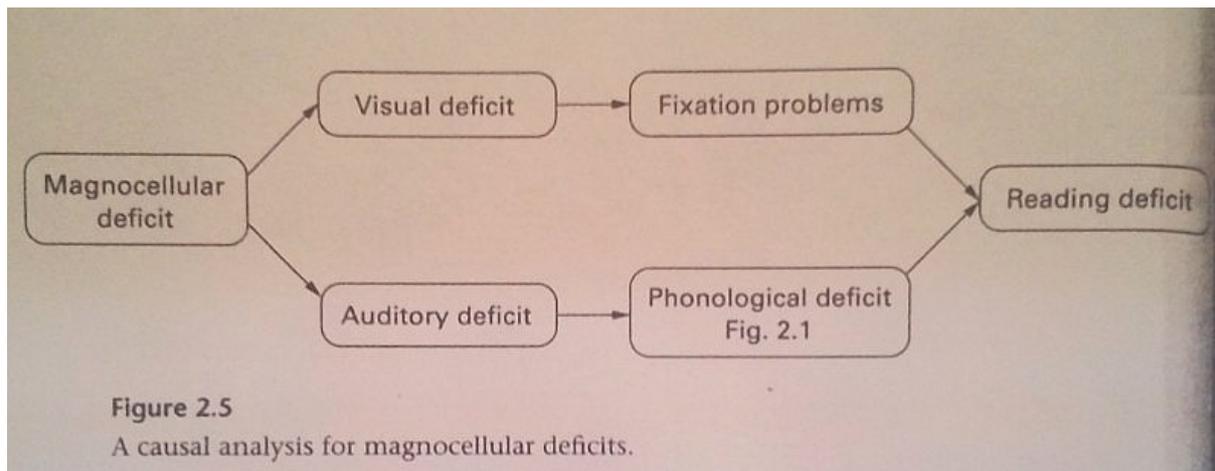


Picture 15

The visual cortex with the optic nerve and the lateral geniculate nucleus

Source:

http://www.nottingham.ac.uk/biochemcourses/NTM3/Thomas_Kinniburgh/The_Brain/Primary_visual_cortex.html

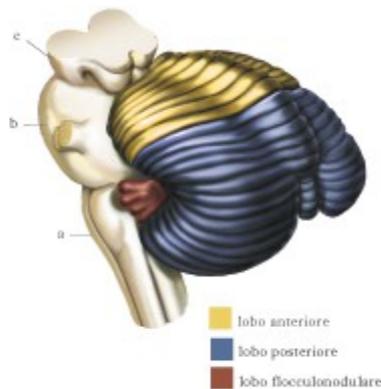


Picture 16

Nicolason and Fawcett, 2010, p. 36

Magnocellular deficit causes visual deficits in terms of fixation problems and auditory deficits in terms of phonological deficit. These problems may cause reading deficits.

3.4.2 The Cerebellar Deficit Hypothesis



Picture 17

The cerebellum

Source: [http://www.treccani.it/enciclopedia/cervelletto_res-5a62bc8a-907c-11e1-9b2f-d5ce3506d72e_\(Dizionario-di-Medicina\)/](http://www.treccani.it/enciclopedia/cervelletto_res-5a62bc8a-907c-11e1-9b2f-d5ce3506d72e_(Dizionario-di-Medicina)/)

Problems in motor skills and automatization involve the cerebellum (Nicolson et al., 1999; Finch et al., 2002). This hypothesis is strictly connected to the

Automatization Deficit Hypothesis. “The cerebellar deficit hypothesis arose as a brain-level instantiation of the automatization deficit hypothesis” (Nicholson & Fawcett, 2010, p. 127)¹⁶.

3.5 Genetic level

There is a large body of research (including several longitudinal studies) on the genetic causes of dyslexia (for an exhaustive review I refer to Molfese et al., in Reid et al., 2008, pp. 99 – 120).

It has been reported that the reading problems based on a familiar history is around 40 %.

The studies show that dyslexia may occur in more than one familiar member. Furthermore, the reading performances of the dyslexics' familiar have been founded to be worse than those of control groups.

These level of analysis is useful in the early diagnosis of the reading disorder.

Summary

Levels of analysis	Hypotheses
COGNITIVE LEVEL	Phonological deficit hypothesis Double deficit hypothesis
LEARNING DISABILITY	Deficit in the procedural learning system
BRAIN LEVEL	Magnocellular deficit hypothesis Cerebellar deficit hypothesis
GENETIC LEVEL	Genetic causes of dyslexia

16 An exhaustive description of this theory is given by Nicholson and Fawcett 2010, p. 91, ff.

4. Dyslexia (and LD) in adolescents and young adults

Learning disabilities are lifelong

(Learning Disabilities Association of Canada [LDAC])

Learning disorders aren't limited to childhood. Recent studies report that these problems tend to continue in adolescence and adulthood. In this chapter, we report the main diagnostic criteria in identifying and evaluating dyslexia in adulthood and we describe the cognitive characteristics of adult with learning disorders.

This section is based on the following questions:

- *What is the course of the DSA in adolescence and adulthood?*
- *What are the cognitive characteristics of an adult with DSA?*
- *What instruments are used to identify and verify the presence of one or more than one DSA in adults?*

4.1 Learning disabilities are lifelong¹⁷

The specific learning problems associated with learning disabilities (LD) often persist from childhood, to adolescence into adulthood. (Klassen et al., 2011)

Current definitions of learning difficulties (for example the definition given by the *Learning Disabilities Association of Canada* [LDAC]: “learning disabilities are lifelong”) and the longitudinal studies show that specific learning difficulties diagnosed in childhood may continue in adolescence and adulthood.

4.2 Studies on adults with learning disorders

What is the course of the learning disorders in adolescence and adulthood? To

¹⁷ Learning Disabilities Association of Canada [LDAC].

answer to this question we should take into account all the personal histories.

Adult dyslexia assumes specific features:

Dyslexia is a learning disorder of reading that remains throughout the lifetime of the individual, although it assumes different degrees of expression depending on the severity of the disorder, the cognitive characteristics of the subject and the educational opportunities or relationships that receives (Martino et al., 2011, p. 119,120).

The “degrees of expression” of adult dyslexia depend on:

- the severity of the disorder: as indicated by the DMS V, dyslexia (and LD in general) exist in different degrees. A disorder classified as medium or severe, for example, don't decrease completely with age. However, generally, we consider learning disorders as lifelong characteristics.
- the cognitive characteristics of the subjects: adults present different characteristics in the way they process information. Furthermore they develop, throughout their life, different strategies in order to supply their learning problems and their deficits.
- the educational opportunities and the relationships: in the life of a dyslexic subject, education (academic support, knowledge of specific strategies or instruments) and relationships (inclusion) have a crucial role in the development of their cognitive abilities and of their self-concept.

4.2.1 Does dyslexia continue in adolescence and adulthood?

A very small amount of studies is available for the Italian language, so researchers must consider studies that refer to other languages. There is a limit: the orthographic differences of the different languages determine differences in the characteristics of the languages diseases.

In reading, it seems that the problems related to LD don't decrease completely

with age. In particular, the difficulties persist in those areas that are typically involved in the language impairment, such as reading speed or accuracy (Snowling, 1997; Hanley, 1997; Hatcher et al., 2002). Decoding speed continues to be problematic in people with one or more DSA, while accuracy tends to improve in connection with the educational level.

A revision with a meta-analysis (Swanson, 2009) on 52 studies (1963 – 2007, conducted mainly on English speakers) investigates the neuropsychological aspects that permit to distinguish dyslexic adult and adult without reading impairment (age 18 – 44). The results in the different tasks shows that reading performances are still poor in adult with dyslexia. So, reading process in adult with dyslexia are still impaired.

In 2007, in a study on 15 Polish university students (age 19 - 31), Reid and colleagues try to delineate a cognitive profile of the dyslexic adult on tests developed within the three main theories of developmental dyslexia (phonological, visual magnocellular and cerebellar) and to investigate which theory can account for these profiles. The research shows the complexity of giving a definition of dyslexia in adulthood and purposes a definition that considers different sub-types of dyslexia. In fact, it is difficult to delineate a coherent cognitive/neuropsychological profile of an adult with dyslexia

An adult, in the course of his life, finds strategies to supply difficulties: individuals show different patterns of difficulties.

A small number of studies that consider the course of the other DSA in adulthood are nowadays available (PARCC 2011).

4.3 Adult diagnosis

In general, we can divide young-adult dyslexic in two main groups: those who received a diagnosis during their childhood and those who known about their impairment only in adolescence or adulthood.

Scoprii per caso di essere dislessico [...] Io non avevo mai sentito parlare di dislessia. [...] Andai sul sito dell'AID e e mi ricordo bene che c'era, tra gli indicatori, la domanda: «Confondi la destra con la sinistra?». Quando giravo in macchina era

risaputo che io mi confondessi. Inoltre avevo difficoltà ad allacciarmi le scarpe e c'erano naturalmente le difficoltà di lettura... [...] Mi diagnosticarono a trent'anni (ora ne ho trentotto) e i dottori mi dissero che non c'era molto che ormai potevo fare [...]. (Ghidoni et al., 2012, p. 57-58)

Enrico Riva is a dyslexic adult. He lives and works in London. Describing his experience with dyslexia, which affects not only the school life, but also some common aspect of everyday life, he underlines the problems deriving from receiving a late diagnosis. Only during his adulthood he received an explanation for all these problems.

Dyslexia (and the other DSA) usually received a diagnosis during childhood, but there are cases of adult diagnosis.

4.3.1 An instrument for the diagnosis of dyslexia in adulthood: Adult Dyslexia Check List (Vinegrad, 1994)

In introducing in an operative way some aspects of adult dyslexia, in this section I present an instrument used for a preliminary diagnosis of dyslexia in adults (or adolescents): the *Adult Dyslexia Check List* (Vinegrad, 1994).

The questionnaire presents a range of different questions.

1. Do you confuse visually similar words such as cat and cot?
2. Do you lose your place or miss out lines when reading?
3. Do you confuse the names of objects, for example table for chair?
4. Do you have trouble telling left from right?
5. Is map reading or finding your way to a strange place confusing?
6. Do you re-read paragraphs to understand them?
7. Do you get confused when given several instructions at once?
8. Do you make mistakes when taking down telephone messages?
9. Do you find it difficult to find the right word to say?
10. How often do you think of creative solutions to problems?
11. How easy do you find it to sound out words such as e-le-phant?
12. When writing, do you find it difficult to organise thoughts on paper?
13. Did you learn your multiplication tables easily?
14. How easy do you find it to recite the alphabet?
15. How hard do you find it to read aloud?

- Linguistic problems
- Orientation problems
- Executive problems
- Short term memory problems
- Learning styles

The questionnaire comprehends questions that investigate several aspects of adult dyslexia: reading, writing and linguistic problems, problems in orientation (telling left from right is a problem frequently reported by dyslexic subjects), executive problems, short term memory problems, cognitive styles, problems with math.

It is easy to understand that all these problems can have a bad effect on life, not only in contexts requiring reading or writing competence, but also in other practical situations.

4.4 Assessment of cognitive characteristics of adult dyslexia

4.4.1 The *Computerised screening for dyslexia in adults*

A recent standardized instrument of for the assessment of adult dyslexia is the *Computerised screening for dyslexia in adults* by Chris Singleton, Joanna Horne and Fiona Simmons (UK) (Singleton et al., 2009). This instrument is made up by three tests: *Word Recognition Test*, *Word Construction Test* and *Memory Test* and investigates the phonological processes, the lexicon and the working memory process.

4.4.2 A research by Padua University

La diagnosi di dislessia negli adulti appare in Italia ancora un po' limitata, in quanto i servizi diagnostici in ambito evolutivo non possono prendere in carico soggetti che hanno superato i 18 anni, mentre i servizi che effettuano diagnosi neuropsicologica nell'adulto raramente si occupano di dislessia. Esiste anche il problema della mancanza di strumenti diagnostici costituiti ad hoc per valutare la lettura nell'adulto. (Martino et al. p. 121)

A group of Italian researchers (Martino, Pappalardo, Re, Tressoldi, Lucangeli Cornoldi¹⁸) studied in order to obtain normative data and to cope with the restricted number of instruments for evaluating reading and writing abilities in adults. To realize

18 Cornoldi, Friso e Pra Baldi, 2010.

this project, the researchers adopted existing instruments¹⁹ that had been adapted for their purpose. The tasks investigate and evaluate competences and use different parameters²⁰:

- Contextualized reading: evaluation of speed and accuracy.
- Words reading: evaluation of speed and accuracy.
- Non-words reading: evaluation of speed and accuracy.
- Comprehension: evaluation of text comprehension.
- Lexical decision in articulatory suppression²¹: this task is particularly effective in investigating the automation of the reading process. The students are asked to recognize and indicate only words in a list of words and non-words, while they are articulating the syllable “LA”. In this task the speed is evaluated.
- Writing (simple dictation exercise and dictation exercise in articulatory suppression). These tasks are used to evaluate the competence in the orthography.
- Writing speed (in normal conditions and in articulatory suppression). Evaluation of writing speed.
- Syllable span: repetition of of syllables and sequences of syllables. This task is used to evaluate the working memory.
- Corsi's test: in this task the subjects are asked to memorize a sequence of positions in a table. The test is used to evaluate the visuo-spatial memory.

Subjects with dyslexia²² showed lower performances compared with the control group, in particular in the tasks that evaluated speed and accuracy and in the articulatory suppression conditions.

19 Ivi.

20 Martino et al. 2011, p. 124 ff.

21 The tasks with articulatory suppression have been created in this study for adults.

22 104 students (mean age: 20 years) with a DSA diagnosis.

Summary

Learning disorders seem to persist in adolescence and adulthood. They present specific features depending on the cognitive characteristics of the individual and of the education and social opportunities. It is crucial to find out effective assessment tools that investigates the linguistic and cognitive abilities, in order to limitate the impact of the learning problem in the life of these subjects.

5. Emotional problems associated with dyslexia

Alcuni giorni fa sono passata davanti a una scuola elementare, era una giornata calda e le finestre erano aperte, ho sentito dei bambini che parlavano ad alta voce, forse era l'ora di ricreazione, sono scappata via, quasi mi scendevano le lacrime, ho rivissuto il mio passato ed è tornato il magone, il senso di impotenza vissuto per anni.²³

Dyslexia and LD are problems that affect the whole life of the individuals. In particular if we do research on adolescents or adults with learning diseases, we should consider the emotional problems that may condition their life.

In this chapter we describe internalizing problems in general and the relationship between learning diseases and internalizing problems. We focus in particular on anxiety.

The second part of the chapter focuses on the building of the self-concept and self-esteem and on how dyslexia and DSA may influence this processes that are crucial for people.

This chapter tries to answer to the following questions:

- *What do we mean when we refer to “internalizing” problems?*
- *What did the research find about the relationship between dyslexia and internalizing problems?*
- *What instruments does the researchers utilize to assess anxiety in students with dyslexia?*

5.1 “The human side of dyslexia²⁴”

*I'm asked to read aloud in front of the class,
But the words swim before my eyes.
I start to sweat, I'm breathing fast;
The print I see I cannot recognize.*

23 Testimony by a dyslexic adult (Cristina, 27 years old). Dettori, 2015, p. 16.

24 Burden, 2005, p. 1.

*The students stare expectantly, they wait for me to speak.
But I can't focus, can't grasp the words;
I feel so useless, I feel so weak;
My eyes tear up, and my vision's blurred.*

*The giggles start as they see my trouble,
No one seems to understand what's wrong.
The letters, for me, flip around and double;
My class assumes I'm stupid because I'm taking so long.*

*Their laughing faces fill my head,
Mocking me, making me feel like I'm somehow less
Important than they. "Let one of us read instead!"
I shrink at their success.*

*I don't know why I am this way,
I've done nothing to deserve this;
Why choose one person through which to convey
The pressure that becomes paralysis?
I finally decide there's no more use;
I descend from the podium, shamefaced.
My teacher's mad, she thinks it's some ruse;
For my punishment, I am braced.*

*I sink in my seat, my skin a lot paler,
Through the window, a cloud covers the sun.
But I don't notice, all I see is my failure;
Once again, the dyslexia has won²⁵.*

This poem was written by a 9 years old Canadian child. The text is useful to visualize how a child with a reading disability can feel in a context requiring competences and in front of the peers. How will these negative emotions influence her future?

In the last years the research has turned the attention to the emotional aspects of learning difficulties.

25 <http://www.dyslexiaassociation.ca/francais/questce.shtml>.

Robert Burden, introducing his monograph on the relationship between dyslexia and the development of self-concept (Burden, 2005), denounces the lack of consideration given to the human side of dyslexia, which he defines a “unjustifiably neglected area of research” (Burden, 2005, p. 1). Burden refers in particular to dyslexia, but his considerations are certainly useful in introducing the problem referring to all LD.

Firstly, the term ' unjustifiably neglected' refers to the fact that by far the bulk of research reports and papers published over the past ten years with dyslexia as their main topic have dwelt upon two issues, causation and remediation. This is not to deny the importance of research into the key role played by the establishment of phonological awareness, or of the influence of the cerebellum on developing literacy skills [...]. What is contested, however, is the neglect of the human side of dyslexia in much of this writing [...]. (Burden, 2005, p. 1)

This “neglected area” is considered a gap in the framework of dyslexia research. The theories developed about the nature of dyslexia (i. e. he refers to the neuropsychological research on the cerebellum and to the investigations on the linguistic competences of dyslexic people) and the studies on “remediation” may be combined with further studies based on the emotional (“human”) aspects of the learning difficulty.

The author indicates Barbara Maughan as the first who “pointed to the relative absence of research into the relationship between reading and emotion”. Her research on developmental psychiatry has been frequently addressed to the question of the relationship between reading difficulties and emotional and social problems in children and adolescents.

In fact, looking at the problem from different points of view, many researchers have considered this question. The association between learning disabilities and emotions dates back to 1940 (Gates, 1941).

Gates, in a study about reading diseases, pointed out that the 75 % of of poor readers shown psychological diseases (anxiety was indicated as the most pervasive).

Witty e Kopel (1951) reports the severe emotional problems (in particular anxiety and low self esteem) of children of the *Northwest Psycho-Educational Clinic*.

Therefore, these problems have been associated since the early conceptualizations of learning difficulties (in the 1900s).

5.2 Emotional problems in the life of the dyslexic students: recent analysis

It has been assumed that students with learning difficulties have more emotional problems than students without learning difficulties (Abrams, 1986; Greenham, 1999; Halonen et al., 2006; Maag and Reid, 2006; Nelson and Harwood, 2011). «Learning difficulties pose a risk factor for the mental health of children and adolescents²⁶» (Patel et al., 2007; Mugnaini et al., 2009).

The following considerations are crucial in our research:

The relationship between learning problems and internalizing problems in children and adolescents is not surprising given the primacy of school experiences in shaping the social, emotional and mental functioning of young people (Waters, Cross & Show 2010). In the reciprocal development view of LD and psychosocial maladjustment, repeated academic failures by children with LD result in feelings of inferiority and helplessness, which in turn lead to further academic failures and a continuing cycle of psychological maladjustment (Greenham 1999). (Klassen et al., 2011, p. 317 – 318)

In the academic context, the biological factors of learning difficulties associated with the emotional and social factors result in low level of emotional well being and in internalizing problems.

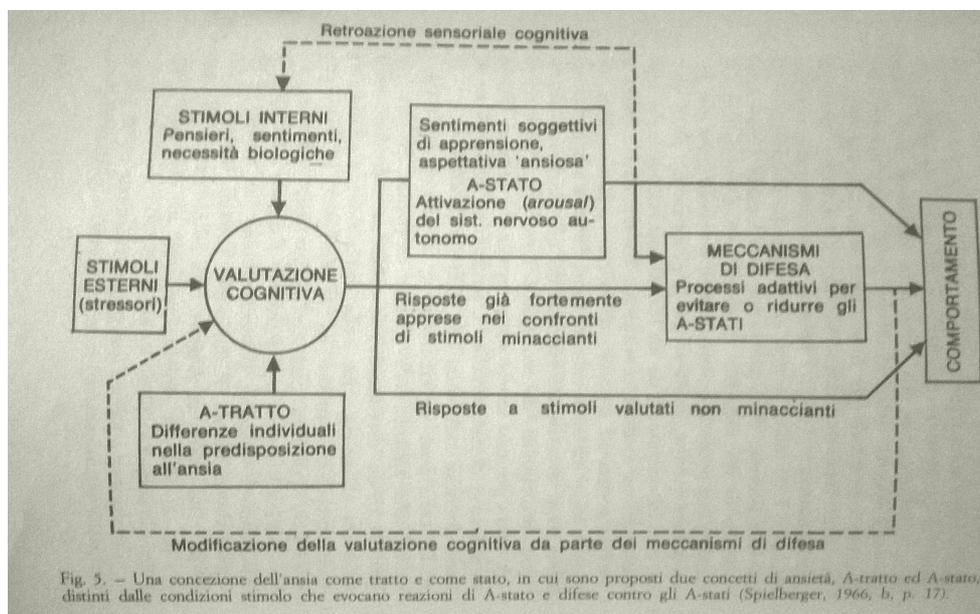
5.3 Highlight: what do we mean with “internalizing problems”?

We use the term *internalizing problems* referring to disturbances of emotions and moods, for anxiety and depressive symptoms.

26 Klassen et al., 2011, p. 317.

Internalizing problems are generally considered to be the subgroup of psychopathology that involve disturbance in emotion or mood, whereas externalizing problems have tended to refer to dysregulations in behavior. [...] the general identification of internalizing problems as focused on emotional components such as sadness, guilt, worry, and the like is consistent across several definitions. [...] internalizing refers to problem or disorder of emotion or mood; the dysregulation of emotions might be thought of as overinternalization of certain emotions such as guilty, anxiety or involvement in emotion of significant others. (Lerner et al., 2009, p. 642, 643²⁷).

5.3.1 Forms of anxiety: trait-anxiety and state-anxiety



Picture 18

Trait anxiety and state anxiety

Source: Spielberger 1966, in Boschi 1981, p. 74

Focusing on anxiety, we take into account the difference between *trait-anxiety* and *state-anxiety*. Cattell (1958) defined the difference between these two manifestations of anxiety. The Spielberger's model (Spielberger, 1966) is relevant. Boschi (Boschi 1981) reports a synthetic description of the model:

²⁷ The contribution has been written by Graber J. A. and Sontag L.M; it refers to internalizing problems during adolescence.

Se la situazione stimolo è cognitivamente valutata come dannosa o minacciante, allora viene evocata una reazione di tipo A-STATO. Attraverso meccanismi di retroazione (feedback), le reazioni A-STATO possono servire come segnale che provoca l'inizio di una serie di comportamenti, tendenti ad evitare la situazione dannosa, riducendo così il livello di A-STATO. La condizione di A-TRATTO è considerata espressione di ciò che rimane delle passate esperienze, le quali in qualche modo determinano le differenze individuali nella tendenza all'ansietà, cioè nella disposizione a considerare certe situazioni dannose ed a rispondere ad esse con A-STATI. (Boschi, 1981, p. 74).

The external stimuli perceived are evaluated by the individual and, if they are considered potentially dangerous, a STATE-ANXIETY reaction is recalled. The STATE-ANXIETY reactions may be used as signals that make the subject reject the potentially dangerous situations.

The TRAIT-ANXIETY condition vary through individuals and depends on subjective characteristics and previous experiences.

In our analysis it is important to notice the cognitive processes involved in this model:

- Sensory perception;
- Attention;
- Memory processes (in particular episodic memory).

For our research it is important to notice how this process is pervading.

5.3.2 Dyslexia and anxiety

Anxiety is a form of emotional distress reported to be frequently experienced by people with learning disabilities (i.e. Huntington and Bender, 1993).

Do people with learning disabilities present more anxious symptoms than the other peers without any learning problem? It is a question to which it is difficult to answer because of the complexity of the label “anxiety” and the variety of the ways in which it may manifest.

Klassen (Klassen et al., 2011) published a meta analysis examining the

association between internalizing problems (in particular anxiety and depressive symptoms) and learning disabilities in adults. The study took into account 15 studies published between 1989 and 2009 and included a total of 16,239 participants. Results from the study suggest that in people with learning disabilities the internalizing problem continue from childhood, to adolescence to adulthood.

The researchers introduces the *abeyance hypothesis* and the *continuance hypothesis*.

The *abeyance hypothesis* suggests that psychological problems associated with learning disabilities may decline in adulthood. A restricted number of studies support this assumption (Boetsch et al., 1996; Raskind et al. 1999).

The Klessen's study confirm instead the *continuance hypothesis*, whose assumption is: "the incidence and impact of internalizing problem may continue after adolescence, and ever worsen in adulthood" (Klessen et al., 2011, p. 319). This theory is supported by several studies.

Wilson, Amstrong, Furrie and Walcot (2009) examined the mental health in a large sample of Canadians (aged 15 to 44 years) with and without learning disabilities and found that people with learning disabilities (in the study they are reported as PWLD, *persons with learning disabilities*) present more internalizing problems (such as distress, depression and anxiety) than people without learning disabilities. Moreover, these problems are reported to increase with age, with older participants reporting lower mental wellness than the younger. People with LD in adulthood may suffer from the loss of the support offered during school-age; in addition, the escalating difficulty in tasks required in everyday life and poor academic record contribute to increase the internalizing problems into adulthood.

Focusing on anxiety, Nelson and Harwood (2011) present the results of a meta analysis of the empirical literature on anxiety symptoms in school-aged students with learning disabilities. They took into account 533 studies reported between 1977²⁸ and 2007. Results indicates that these students present higher mean scores on measures of anxiety then their peers without learning problems.

A variety of theories have been developed to explain the relationship between anxiety and learning disabilities (i. e. secondary reaction, primary disorder and

28 1977 was the first year that LD became a special education classification in an Act of 1975.

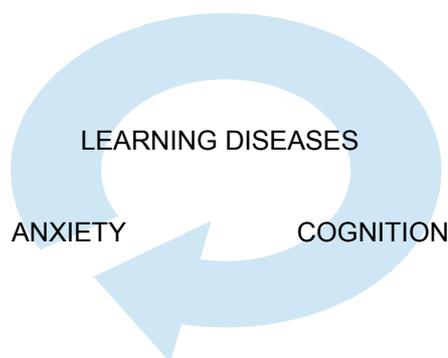
cerebral dysfunction theories²⁹). Anxiety related to academic performance may represent a great obstacle for a child, an adolescent or an adult.

Poor academic performances have a bad effect on the mental wellness of students, causing anxiety deriving from the anticipation of possible failures. In a similar situation anxiety itself has a significant impact on the cognitive and academic performance of students.

High levels of anxiety introduce task-irrelevant cognitions into the limited storage component of the information processing system. This anxiety-produced distracting information disrupts attentional focus and consume space in working memory, resulting in insufficient information processing.

For example, elevated anxiety during reading interferes with the phonological loop, causing the need for articulatory rehearsal, which taxes working memory capacity.

Similarly, the negative association between trait anxiety and math achievement has been found to be mediated by verbal working memory. (Nelson and Harwood, 2011, p. 4)



Understanding the level of anxiety experienced by the students with learning diseases has implications for assessment: if we consider the strong link that exist between anxiety and learning problems and academic performances, we understand that it is important to take into account the emotional face of learning diseases in the assessment. Investigating these aspects may have a good effect on intervention and training.

29 Spreen, 1989; Nelson and Harwood 2011, p. 3;.

5.4 The construction of the self-concept

Introducing this paragraph, it is useful to present some key concepts. For each concept many definitions have been proposed through the years. Only the most significant for our purpose are presented. We refer in particular to Burden (2005).

- *self-concept*: it is the perception of a subject about his characteristics and abilities in relation to society and environments.
- *self-esteem*: it is different from *self-concept* and it consists of the belief on his capability to overcome the problems.
- *attribution theory*: in social psychology, *attribution* is the process by which individuals explain the causes of behavior and events (the reasons to which individuals attributes their successes and failures). Attribution theory explains this process.
- *locus of control*³⁰: it refers to whether the reasons of success or failure are perceived. They may be perceived as *internal*, within the subject's own *control* or as *external*, out of the individual's control and determined by other forces or people that are considered to have more power.

All people are influenced by the different contexts where they live (i.e. the educational context of the school, family, society). This influence determines the way they perceive not only the society, but also themselves.

The socio-cultural theory (sometimes referred to as social constructionism/constructivism) essentially takes the view that all knowledge is constructed (rather than transmitted) as a result of social interactions within specific cultural contexts. [...] this suggest that dyslexics are not doomed to a lifetime of failure as a result of their genetic endowments or physiological

30 Other concepts that should been taken into account are: learned helplessness, motivation, attitude, the self, the sense of agency, the concept of self efficacy.

inadequacies [...]. (Burden, 2005, p. 16)

The sociologist and educator Andrew Pollard (Pollard, 1996), whose research interests include learner perspectives, teaching-learning processes, pedagogy and assessment and the development of evidence-informed classroom practice, emphasizes the fact that “people “act” on the basis of meanings and understandings which they develop through interaction with others” (Burden 2005, p. 16).

Human action is considered having a “social bias” rather than deriving, from instinct or genetic factors.

5.4.1 The development of self concept and its relation with self esteem

In describing learning difficulties and their related problems, it is crucial to take into account the development of the self-concept, in particular if we refer to adolescent students.

One of the most important questions with which each of us is faced at various times in our lives is, 'who am I?' As young children develop they gradually become more and more aware that whilst there are many ways in which they are similar to other boys and girls, there are at least as many ways in which they differ. This realization, which is largely shaped by the social and cultural context into which they are born and the nature of their interactions with significant others in their lives, leads to the constructions of each person's unique sense of identity. (Burden, 2005, p. 5)

The psychologist Eric Erickson (Erickson, 1959) suggested that during adolescence a sense of “ego integrity” is established. In his analysis this is a crucial step in the life of an individual.

Carl Rogers, an American psychologist who was among the founders of the humanistic approach to the psychotherapy, also called *Client centered therapy*, gave a definition of the self-concept (Rogers, 1951) that may be strongly useful for our research:

(self concept is) composed of such elements as the perceptions of one's characteristics and abilities: the percepts and concepts of the self in relation to

others and to environments; the value qualities which are perceived as associated with experiences and objects; and the goals and the ideas which are perceived of having positive or negative valence. (Rogers, 1951, p. 38)

Jerome Bruner (Bruner, 1996) emphasized the link between self-concept and education and Burns introduced, in 1982, two elements composing the **self-concept: self image and self evaluation**. The self image is “the set of beliefs that we hold about various aspects of ourselves” (Burden 2005, p. 6) and the self-evaluation may be defined as the “evaluation of these beliefs” is what we use to call **self-esteem**.

Referring to Burn's analysis, the contents may be summarized as follows:



In this sense, (Burns 1982), the self concept is “a set of subjectively constructed attributes and feelings, which take on their meaning for an individual through the general evaluation of that quality or attribute in their particular society” (Burden, 2005, p. 7) It is important to underline the importance of the strict connection between the role of the individual and the role of society in the construction of the self concept.

Burns attributes three roles to self concept:

1. maintaining a sense of inner consistency. According to “the principle of homeostasis”, human beings need to establish a sense of inner equilibrium in order to survive.

2. determining how experience are interpreted: it allows us to understand the meaning of what happens to us (this aspect is connected with anxiety, whose processes are strongly influenced by the memories of experienced situations).
3. providing a set of expectations that contribute to determine the results of our acting. It is important to underline that this aspect plays a crucial role in the academic life (i. e. proofs): in Burns's analysis the “prophecies” of students about their performance determine how their performance may be. He corroborated this assumption in several studies which demonstrated that students with a self-concept which define them as inadequate, show low achieves.

The concept of self-concept and self-esteem in the literature are confused. In Burden's analysis, self concept and self esteem are not considered the same thing. “Positive self esteem is not merely a matter of feeling good about oneself. It consists of a much more deep-roted belief in one's capability to overcome the problems with winch one is faced (...)” (Burden, 2010, p. 9).

5.4.2 Self-concept and self-esteem of people with dyslexia

It is clear the importance of self-concept in the academic context and in life in general.

Several research on the educational histories of young dyslexics shown that these ones tend to have feelings of inadequacy and low self esteem in comparison with their peers. These findings cover all the ages and confirm the assumption that dyslexia (and learning impairment) are lifelong. For clarity I divide the significant studies in three categories:

- Researches on children: Gjessing and Karlsen (1989) made a research on a group of 3000 schoolchildren of Norway, showing that the children with reading impairment had lower self-esteem and self-confidences than their peers. Lerner (2000) shown that these problems tend to survive passing from

childhood to adolescence. Frederickson and Jacobs (2001) found that children with dyslexia presented lower academical³¹ self concept than the other matched children without learning difficulties, although their self worth was not significantly low. They also found that children with a strong internal *locus of control* tended to have high academical self concept, while children who attribute their failures to external factors.

It is important to note that poor readers tend to blame themselves for failure and to attribute success to luck. They tend to have low expectations and to react negatively to failures (Butkowsky and Willows, 1980).

- Researches on adolescents: Fairhurst and Pumfrey, in 1992, shown that poor readers tend to have a low self esteem and difficulties in inclusion.
- Researches on adults: Riddick (Riddick et al., 1999) compared the past and the present educational histories of university students with dyslexia with the matched control group. Dyslexic students shown significantly lower self esteem than the students in the control group. In addition, the students with dyslexia reported more anxious problems and feelings of inadequacy.

5.4.3 Self-concept, self-esteem: further findings

Remarking the difference between self-concept and self esteem, it has been found (in the Norwegian context, in a study on 600 primary school children by Skaalvick and Hagvet, 1990) that “academic self concept acts a mediating variable between academic performance and global self esteem as well as providing a causal influence on academic achievement” (Burden 2000, p. 13).

As reactions, those who present a low self-esteem “try to protect or restore their vulnerable self-esteem in different ways, mostly by hiding, working hard, fighting back, or explaining their difficulties (Alesi, Rappo, & Pepi, 2012; Singer, 2008). (Daderman et al., 2014, p. 51)

31 Referring to the school context in general.

Students who present these problems try to protect themselves. Singer (2008) studied a group of Dutch children with dyslexia and demonstrated that all the subjects had developed different strategies in order to protect themselves. The impact of LD may be increased by a lack of diagnosis and lack of support.

These reactions are more intense if the person suffer from undiagnosed dyslexia (e.g., Edwards, 1994), leading to feelings of frustration, shame and loneliness. (Daderman et al., 2014, p. 51)

5.4.4 A study on young women and a questionnaire on self-esteem

Daderman et al. (2014), tested a group of 12 young Swedish women with dyslexia (aged from 16 to 30 years), all undergoing some form of education. “Only two of the participants in the study had previously been diagnosed as having dyslexia” (Daderman et al., 2014, p.52).

The researchers uses the questionnaire *Jag tycker jag är* (“*I consider myself to be*”, named also “*I think I am*” (Ouvinen-Birgerstam, 1999).

The results confirm that young women with dyslexia had lower self esteem than the women in the general population.

Summary

People with learning difficulties (in the course of their life) present frequent emotional (internalizing) problems, in particular anxiety, that is strictly connected with the academical performances and the cognitive abilities.

They don't develop a strong self-concept and show lower self-esteem if compared with matched groups. These negative feelings seem to persist into adolescence and adulthood.

6. Learning styles and compensatory tools in higher education

"The key for teens and adults is a positive construct of dyslexia, a clear understanding of one's strengths in learning and how to overcome the weaknesses associated with dyslexia"

Jodi Clements, ADA President³²

In the early 1990s a group of people with autism rose up against the medical classifications which labeled them as "different". Their movement contributed to the introduction of a new concept in the field of learning studies: neurodiversity. People present different cognitive characteristics (cognitive styles) that determine different ways in learning (learning styles). This chapter present the learning characteristics of people with LD. Different learning characteristics require different teaching methods. The second part of the chapter presents the available compensatory tools for dyslexic students and several Italian project supporting research and practice for dyslexia and LD.

The chapter try to answer to the following questions:

- 1. What is neurodiversity?*
- 2. What do we mean with cognitive style and learning style?*
- 3. What compensatory instruments are available for dyslexia?*
- 4. What are the aims of the projects supporting dyslexia in Italy?*

6.1 "Neurodiversity": claiming rights

The term "neurodiversity" indicates a concept and an organization, "un concetto e un movimento" (Ghidoni et al., 2012, p. 103).

It was forged on the web, in the early 1990s by a group of people with autistic spectrum disorder who protested against the classifier criteria that labeled them as "different".

The first time that "neurodiversity" appeared in the literature was 1996, in "The

32 <http://dyslexiaassociation.org.au/index.php?page=teens-and-adults-with-dyslexia>

Atlantic”, the article was written by Harvey Blume (Blume 1996), whose I report several lines:

Neurodiversity may be every bit as crucial for the human race as biodiversity is for life in general. Who can say what form of wiring will prove best at any given moment? Cybernetics and computer culture, for example, may favor a somewhat autistic cast of mind.

We can define neurodiversity in this terms:

(...) l'idea che le variazioni dello sviluppo cerebrale e delle sue funzioni dovrebbero essere apprezzate e accettate come le altre forme di variabilità fisica interindividuale. In questo senso la neurodiversità è vista come l'insieme delle strutture neurologiche umane.

(Ghidoni et al., 2012, p. 104)

The variations in the development of the cerebral structures should be appreciated and accepted as we do for the inter-individual physical variability.

Neurodiversity refers to the whole overview of the neurological structures in humans.

It is quite clear that this concept clashes with the formal definitions given by the international systems of classification (i.e. the DSM) that describe the “disorders”/“disabilities” in order to resolve them. Michael Oliver defined this schemas as “the personal tragedy theory of disability” (Oliver 1990).

Those who support this “movement” (i.e: Harmon, 2004; Armstrong 2005) have included in this area of interest several diseases: ADHD, LD, dyspraxia, Tourette syndrome and autism.

6.1.1 How the concept of neurodiversity may be useful?

Neurodiversity highlights the importance of individuating the force-points of an individual with one or more disabilities. This concept is far from the traditional clinical model, but it may be considered as complementary. The clinical models have a crucial role in identifying the problems, but an approach which gives importance to the differences and the characteristics may help in finding effective measures to

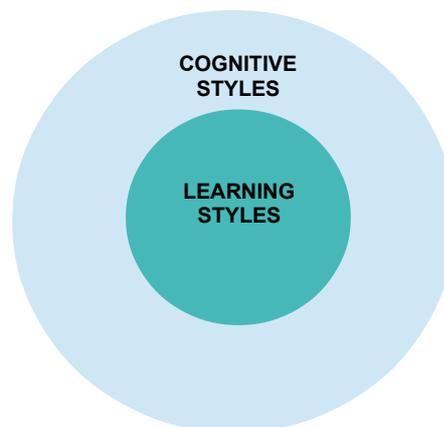
support people.

6.2 Cognitive styles and learning styles

Gardner (Gardner, 1987) defined the concept of “multiple intelligences”, assuming that intelligence isn't a process that can be entirely measured by standardized test (i.e. the IQ tests), but that it is composed by different cognitive modalities (he identified eight different “intelligences”), suggesting that the way of understanding reality varies across people.

Two key concept that may help in understanding the practical implications of neurodiversity are:

1. Cognitive-styles
2. Learning-styles



6.2.1 Cognitive styles

Cognitive styles refer to different elaboration modalities adopted by an individual, whose they are permanent cognitive characteristics (in this sense they can be defined as *styles*).

They have been described as decision-schemas (Bruner, 1956), different modalities in using memory processes (Hunt, 1978), experiential learning (Kolb, 1981), adaptation tools (Gardner, 1987) or mental governments (Sternberg 1990).

More specifically, Kolb (1981) purposes that individuals learning depend on their own experiences. Adults observe and conceptualize experiences in order to learn how to behave in the different situations.

Sternberg (1990) assumes that people govern and organize their own cognitive abilities responding to the different external situations and problems, using one or more styles. He purposes 13 different cognitive styles using government metaphors (legislative, executive, legislative, monarchic, hierarchical, oligarchic, anarchic, global, analytic, internal, external, radical and conservator).

Cornoldi (Cornoldi and De Beni, 1993) proposed an exhaustive description of cognitive styles making a distinction between cognitive style and cognitive strategy:

Si ha uno stile cognitivo tutte le volte in cui si evidenzia una tendenza costante e stabile nel tempo a usare una determinata classe di strategie. Se, per esempio, posso arrivare a una decisione seguendo varie modalità finalizzate e controllate, la modalità scelta costituirà una strategia. Se, tuttavia, anche in altri compiti non esattamente simili al precedente che richiedano una decisione, si osserverà che scelgo una strategia simile, avremo una delle condizioni per parlare di stile.

La varietà delle situazioni in cui adotto una medesima strategia dovrà essere tale da non riguardare solo compiti strettamente cognitivi o scolastici, ma anche situazioni della vita di tutti i giorni in cui il comportamento viene a delineare l'intera struttura di personalità. (Cornoldi and De Beni, 1993, p. 17)

Cornoldi and De Beni and the MT research group (2001) report different learning styles organized in six “dichotomies”:

Cognitive styles and their characteristics	
<p>1. GLOBAL</p> <p>The subject prefers to consider the global form of the text before focusing on the details.</p>	<p>ANALYTICAL</p> <p>The subject prefer focusing on the details before having a general view of a text.</p>
<p>This first dichotomy was described by Pallotti (1998) and Vettorel (2006). Balboni (2006) indicates the advantages and the disadvantages of using these different strategies in learning Italian as first language.</p>	

<p>2. SYSTEMATIC The subject approaches the text systematically, analyzing all the characteristics.</p>	<p>INTUITIVE The subject prefers to formulate an hypothesis and works in order to corroborate it.</p>
<p>3. VERBAL A subject with a verbal cognitive style prefers to analyze the verbal aspects of a text.</p>	<p>VISUAL A subject with a visual style may prefer working with visual non-verbal elements.</p>
<p>4 IMPULSIVE The subject with an impulsive cognitive style is rapid in the responses</p>	<p>REFLEXIVE The “reflexive” subject tends to be slow and accurate. He analyzes the different possibilities, preferring objective criteria.</p>
<p>5. CONTEXT-DEPENDENT The subject depends on the context. He prefers to analyse information taking into account the contextual elements. (Pallotti, 1998)</p>	<p>CONTEXT-INDEPENDENT The subject is independent from the context and prefers to isolate the single units from the context.</p>
<p>6. CONVERGENT The subject follows logic sequences on the basis of the available information.</p>	<p>DIVERGENT The subject proceeds without following precise rules, but creating personal strategies.</p>

Gregorc (1982) introduced the *abstract/concrete* and the *sequential/casual* dichotomies. The “concrete” subjects focus on physical stimuli while “abstract” subjects prefer intuitive processes. This first distinction pertains to the perception domain. Referring to the processing domain, subject using the sequential modality storage information linearly, while “casual” subjects prefer a (apparently) chaotic modality.

6.2.2 Learning styles

A learning style can be defines as follows:

E' l'approccio all'apprendimento preferito da una persona, il suo modo tipico e stabile di percepire, elaborare, immagazzinare e recuperare le informazioni.
(Mariani, 2000)

Learning-style is specific to the learning process. It is systematic: the styles vary across people, but they characterize constantly an individual. Learning styles and cognitive styles are strictly connected.

Mariani and Pozzo (2002) identifies four macro-areas that are involved in the differentiation of learning-styles:

1. physical and environmental preferences
2. sensory modalities
3. cognitive styles
4. personalities

Referring to the sensory modalities, Mariani identifies four learning styles:

1. Visual-verbal: the subject who uses this canal prefers reading and writing.
2. Visual-non verbal (visual learning): the subject prefers pictures, symbols, maps.
3. Auditory: the subjects prefers listening to information, oral tasks and discussions.
4. Kinaesthetic: the subject prefers practical activities.

6.3 Learning styles in people with specific learning disorders

We presented the different approaches and findings in the field of cognitive styles and learning styles in order to provide a theoretical background for these two crucial and quite new concepts. However, to decide what of these styles may pertain to LD people is far from our aims.

Considering their difficulties in reading and writing we may just assume that LD subjects don't prefer a learning style founded on these two domains. Instead, they most probably prefer the visual-non verbal style, the auditory style and the kinaesthetic style (from those identified by Mariani) in processing information and in the learning processes.



Picture 19

Learning styles: Visual-verbal (reading); visual- non verbal; auditory; kinesthetic.

Source: Stella and Grandi, 2011, p. 21.

Curci and Ruggerini (1991) displayed the heterogeneity of the cognitive styles analyzing the neuropsychological profiles of 40 children with a LD diagnosis.

Findings of this kind help to understand the impossibility to determine what learning style may be the most probable for LD subjects. What is really important is that every single subject should be able to understand its own cognitive functioning (*self-awareness*) and to find effective strategies and tools to overcome the difficulties.

6.4 Supporting students with LD



Picture 20

One of them doesn't want to ride the bike

The picture is from an example given on the web by Giacomo Cutrera (the author of *Demone Bianco*) in order to dispel the myth that a dyslexic student is "lazy".

Source: <http://www.aiutodislessia.net/wordpress/wp-content/uploads/2013/12/La-Mia-Dislessia-slide-e-esempi.pdf>

In brief, students (now we refer in particular to teenagers and young adults attending school) with specific learning diseases present deficits in the reading, writing and calculation domains (automation problems) in spite of their intact cognitive profile. It has been demonstrated that people with LD may present internalizing problems (in particular anxiety) and frequently they don't develop a positive self concept. These subjects present peculiar cognitive characteristics and different learning styles.

The diagnosis, the neuro-psychological treatment and the speech-therapy are crucial as well as the influence of family and of the social contexts³³.

The scholastic support is equally decisive for the consolidation of abilities and strategies and for the inclusion in the group of peers.

³³ Family and of the social contexts are crucial also in learning (Bernstein 1961, 1971).

Gli studenti con diagnosi di DSA hanno diritto a fruire di appositi provvedimenti dispensativi e compensativi di flessibilità didattica nel corso dei cicli di istruzione e formazione e negli studi universitari (Law 170/2010, art. 5)

According to the current legislation, students with diagnosed LD require:

- exempting measures (*misure dispensative*)
- compensatory instruments (*strumenti compensativi*)

Exempting measures are didactic strategies that may encourage the inclusion of the students with LD and facilitate the achievement of the didactic objectives.

Students with LD should be exempted from reading aloud, speed dictations and other tasks that require specific abilities that may be compromised. Other exempting measures regard the organization of homework and proofs.

Compensatory instruments are described in the following section.

6.5 Compensatory instruments

Compensation refers to a system of strategies and tools developed for dealing with specific difficulties.

Referring to people with LD, we can consider compensation:

- an appropriate study method, based on the knowledge of alternative learning styles.
- compensatory instruments.

Compensatory instruments for specific learning disorders are tools (technological or not technological) that are used in order to supply the weaknesses of people with LD in tasks requiring functions that may be compromised. From a different point of view, they can be defined as instruments that allow LD students to use different learning styles. The traditional learning modalities, founded on reading and writing, are modified by these tools and the learning process of a student with one or more

LD is facilitated.

We can divide compensatory instrument on the basis of their function:

- Specific: they support the deficits directly (for LD: reading, writing, calculation)
- Not-specific (functional): these ones support other cognitive functions that may be compromised in a subject with LD (i. e. working memory).

Furthermore, these tools can be distinguished referring to their technical characteristics:

- Non-technological: the more traditional tools and strategies (tables, visual representations, summaries, using highlighters...)
- Low-technological: common tools that can be used as effective compensatory instrument (using specific fonts, changing the color and the weight of a written text, audio-recorder...)
- High-technological: recent and more sophisticated technologies (commercial or open-source tools or software, i. e. audio books, e-books, vocal synthesis, orthographic aids, digital maps...).

If they are well designed and certified, they can be useful. “All resources need to be thoroughly checked for their suitability and ease of use” (Crombie, 2013, in Beltrán, Abbott and Jones (eds.), p. 138).

6.5.1 Traditional books, digital books and audio books

Paper book is the most utilized tool for reading. However, considering that in dyslexic readers this process isn't automatic, we realize that a student with dyslexia requires several tools that may help in reading.

The pictures and the visual-non verbal object present in the traditional paper book should be enhanced.

A simple tool that can be used by dyslexic readers is the line marker, in Italian it is called “segna-riga” (a signer or a ruler). To delimit the reading space is helpful in reducing the “letter migration” effect (the sensation that letters float) and the visual confusion between text lines, that are phenomena frequently reported by people with

dyslexia.

Digital books are the digital version (*pdf*. format) of the printed books. They are functional in supporting reading and studying. They allow to interact with the text: to search into the text, to extract the most important sections, pictures and tabs and to apply the speech application programs. A.I.D (the Italian Dyslexia Association) has entered into several agreements with the publishers of scholastic books in order to increase the number of digital books available for students with dyslexia.

Audio books are the audio versions of the printed book. They provide the text in the audio format. They may be more useful for light reading than for study.

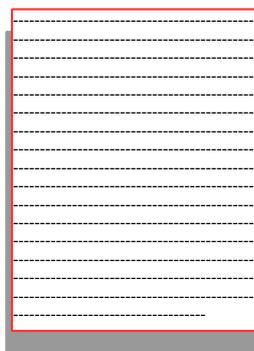
6.5.2 Page format and fonts for dyslexic students

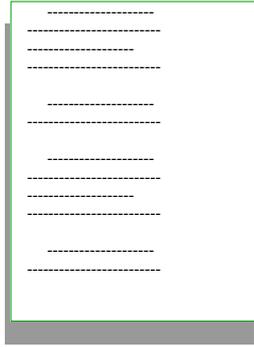
Given the importance of presenting an accessible text to dyslexic readers (in the traditional or in the digital form), it may be useful to present a description of several graphic devices that may facilitate reading.

For people with dyslexia, it may results difficult to read a text (especially if it is a long text), if the layout presents characteristics that causes difficulties in approaching it. To make a text “dyslexic-friendly” we should consider the following problems and solutions:

(a) Page format

If the text is presented as a “block” that occupies the entire page (as shown in the example), it will be difficult for a dyslexic student to approach it easily: it may appear “too long” and the confusion in reading the single lines may be an obstacle.

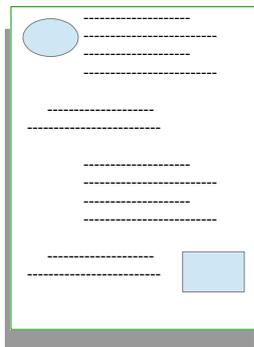




- The text should be divided into paragraphs (with large indentations)
- The margin of the page should be wide.
- We should prefer a left aligned text (no hyphenation)
- Between paragraph there should be a blank line
- The text should be double-spaced or with 1,5 spaces
- Short sentences are preferred.

Lots of different text on the same page (as in the newspaper) for a dyslexic people will be a totally confusing layout.

- We should separate the different sections and we should create enough space between the text and the pictures (they are important for dyslexic people, because of their preference for the visual non- verbal canal), otherwise the student will be distracted.



In a study on twenty dyslexic pupils, Anastassia Plakopiti and Ioanna Bellou (2014) demonstrated an improvement of reading comprehension in electronic over printing text.

The researchers gave the possibility to the subjects to work on an electronic text that they could modify during the test (background color, font size, brightness). The following tab is from their study and may be helpful:

Table 1. Text characteristics for reading by people with dyslexia.

Characteristic	Guideline
Font Size	Minimum 12", ideally 14
Contrast	Limited contrast, dark blue on a pale blue or black on a yellow background
Colour	Not green, pink and red
Font Styles	Not intricate. Ideally Arial and Comic
Type of Letters	No caps, italic or underlined
Line Spacing	Double-spaced
Text width	Large width text
Alignment	Left alignment
Line length	60-70 characters in each line
Paragraphs	Distance between paragraphs
Text orientation	Landscape orientation
Type of paper	Matte printing paper
Writing text	Small and comprehensive sentences

Picture 21

Characteristics of a good text format for dyslexic readers

Source: Plakopiti and Bellou (2014), p. 131.

(b) fonts

Dyslexic people find difficult to recognize and distinguish several letters (i.e. they may confuse b and d; p and q). The letters may appear confused, turned around or jumbed up. In designing a good text for dyslexic readers we should use a font without serifs: "Times new roman", for example, presents sarifs, that may be confusing for a reader with dyslexia, because they modify the letter form.

A font type without serifs is recommended (i.e. Arial, Calibri, Comic Sans). A font

for dyslexic should be functional rather than pleasant.

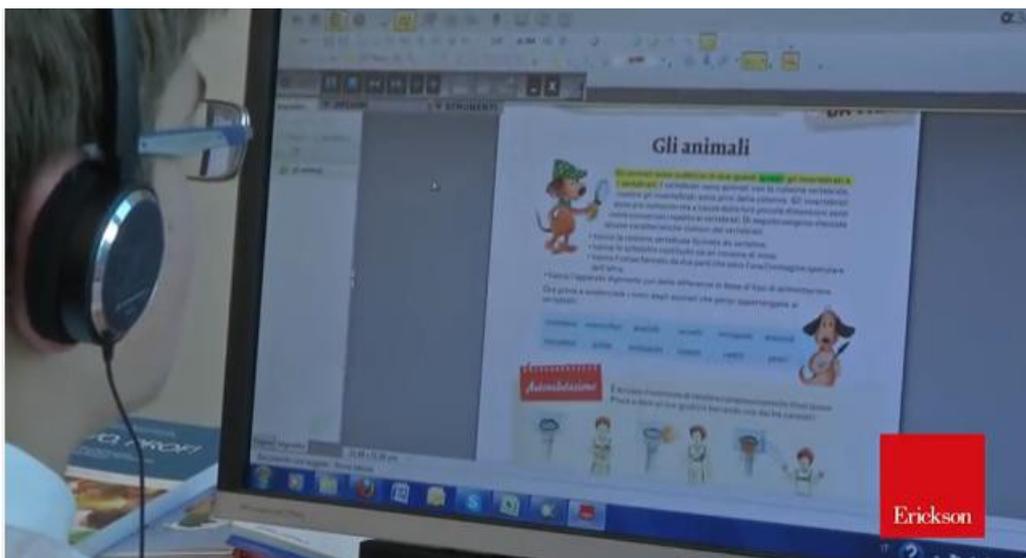
In these last years, several researchers have designed functional font for dyslexics, taking into account their difficulties in reading.

Easy Reading is a commercial font designed for dyslexics. It presents peculiar characteristics that may help people with dyslexia in approaching written texts. The single letters have been designed in order to avoid confusion and letter migration.

6.5.3 Speech Application Programming Interface

In these years, the research on the Speech Application Programming Interface has produced interesting technological tools for the phonetic support.

A speech application (in Italian “sintesi vocale”) is an application that converts the digital text in a vocal speech (e.Speak is an open source available on the internet, Loquendo and Nuance are commercial products).



Picture 22

An example of Speech Application Programming Interface

Source: <https://www.youtube.com/watch?v=sTPDNYP7M7w>

These tools provide a double access to the text: visual and auditory, giving to the dyslexic reader the possibility of utilizing different sensory canals.

Several software that manage the digital speech “behave” like “reading tutors”:

the reader is accompanied in reading (the text is progressively highlighted), providing the reader another access way to the text (the visual, non-verbal) and the “letter migration” and the visual confusion problems are greatly resolved.

These software give the possibility of modifying the reading speed, rewinding and bypassing sections of the text: they in fact imitate what eyes and brain usually do in the automatic reading process.

Anastasis and Erickson distribute several vocal speech software (Carlo Mobile, Personal Reader; Alfa Reader) useful for young students and adults with dyslexia.

6.6 Projects supporting LD in Italy

6.6.1 Associazione Italiana Dislessia (AID)

The Italian Dyslexia Association (AID) was founded in order to make dyslexic people, parents, operators, researchers and people in general aware of what is developmental dyslexia. The association supports research and promotes the updating of the scholastic, medical and social services for LD.

Furthermore, it is a certified point of reference that provides counseling for diagnosis, assistance, rehabilitation and education.

AID organizes different projects for LD:

- Workshops on identification, diagnosis and intervention
- Meetings for psychologists, medical staff, and speech therapists
- Meetings for teachers and school operators
- Meetings for students, adults and parents of children or adolescents with dyslexia
- The association provides financial support for the research.

AID offers a particular support to young dyslexics. ***My story*** project has been developed in the different AID sections operating in Italy in order to emphasize the young dyslexics' voices. The direct evidences of young and adult dyslexics are important: they provides a considerable aid to children, adolescents and people with

dyslexia and LD. The different personal histories, collected in the meetings, may be a stimulus for the construction of a strong awareness of the problem and of the potentials (learning styles, strategies...) of subjects with dyslexia. The project is useful for the research and for the improvement of educational projects.

6.6.2 Other projects supporting students with dyslexia

6.6.2.1 AIRIPA (Associazione Italiana per la Ricerca e l'intervento nella Psicopatologia dell'Apprendimento)

AIRIPA, the Italian Association for Research and Intervention on Learning Psychopathology was founded in 1991, with the aim to bring together the specific competences of researchers and operators working in the field of the learning psychopathology.

Learning psychopathology studies the specific learning diseases (dyslexia, dysgraphia, dysortography, dyscalculia), developmental disorders of scholastic skills, ADHD (Attention Deficit Hyperactivity Disorder) and other disabilities from early childhood to university.

AIRIPA work to:

- promote new research in the field of learning processes and learning problems
- facilitate the spread of information about these problems and the knowledge of compensatory instruments
- develop new valuable models for the intervention
- increase the awareness of the relationship between learning diseases and emotional problems

AIRIPA organizes meetings and workshops for researchers, operators and people with learning problems.

6.6.2.2 Lab.D.A. Laboratorio per I disturbi dell'apprendimento di Cesare Cornoldi

The Padua University Laboratory for Learning Difficulties, directed by professor Cornoldi, provide a high quality service for the diagnosis and the intervention for specific learning diseases, behavioral disorders and emotional difficulties (ADHD, intellectual disabilities, Specific Language Impairment -SLI-, Nonverbal Learning Disorder -NLD- and text comprehension disorders). It provides diagnosis, support and information.

For LD people, the project offers support in the rehabilitation of the reading, ortographical and arithmetic competences and provides psychological services. It promotes the training for the correct using of strategies and technological compensatory tools.

6.6.2.3 “Dislessia”, the Italian dyslexia journal

The Italian journal “Dislessia”, directed by Giacomo Stella, brings together the recent developments of the research on dyslexia and presents instruments, projects and experiences.

Summary

Neurodiversity is a concept that modify the perspecitve in studying learning diseases. Cognitive styles and learning styles represent the heterogeneity of human intelligence. Students with LD require support in order to develop their potentials in relation to their cognitive characteristics. Compensatory tools are useful because they provide students different learning modalities.

7. Anxiety at school in a group of adolescents with DSA

7.1 Abstract

A small sample of young students with dyslexia (9 students aged 16 – 18) studying in Venice took part in this study. The aim of this research was to investigate the presence of anxiety and other emotional difficulties related to the school context in the group of adolescents and to observe their perception of the problems and their evaluation about the supports available at school. We used a questionnaire, an informative sheet and a structural interview. Subjects report several emotional difficulties caused by their learning difficulties. These negative emotions have a bad effect on their lives. Subjects require more attention to their learning and emotional problems. None of them report to use technological compensatory tools available and almost all the participants show a lack of knowledge of the projects supporting dyslexia and LD in Italy. A questionnaire satisfaction survey reports good opinions about the design adopted for the investigation materials.

7.2 Introduction

The aim of this study was to investigate the presence of anxiety disorders in the school context in a group of adolescent students attending high school and to observe their perception of the problem and their evaluation about the supports available at school.

Evidences from previous studies shown that people with learning difficulties present emotional (*internalizing*) problems (Klessen et al., 2011; Wilson et al., 2009), in particular anxiety (Nelson and Harwood, 2011).

The studies demonstrated that internalizing problems persist during years and that anxiety is strictly connected with the academical performances and the cognitive abilities.

Students with LD don't develop a strong self-concept and show lower self-esteem levels if compared with matched groups (Dåderman et al., 2014; Burden, 2000;

Fairhurst and Pumfrey, 1992). These negative feelings seem to persist into adolescence and adulthood.

Referring to the previous studies investigating the relationship between LD and anxiety and LD and self-esteem levels, we expect that students will present several anxiety and self-esteem problems referring to the school context.

In the information sheet we aim to investigate the students' perception of their problems, that is to observe how LD condition their lives.

7.3 Method

7.3.1 Participants

Nine Italian high school students with specific language diseases and without any other known neurological or sensory disorder participated in this study. The students were selected by a psychologist on the basis of a previous LD diagnosis. All the students attended high school in Venice (Vendramin Corner Institute).

The table shows information about participants' ages:

Number of participants	Età media
9 (8 F, 1 M)	17 years

No IQ test was submitted neither the IQ value required.

The previous diagnosis of LD (DSA) was the adopted inclusion criterion.

7.3.2 Materials

7.3.2.1 The questionnaire

We decided to investigate, using a questionnaire, the internalizing problems and several aspects that may influence the participants' relationship with the school

context (anxiety, social anxiety, self-esteem, expectancies).

Existing measures that focused on anxiety and internalizing problems were examined and compared. In particular the following assessment instruments were analysed and taken into account to design our tool:

- The *Test Anxiety Scale* (Spielberger, Sarason, 1978)
- The *Cognitive Test Anxiety Scale* (Cassady, Johnson 2002)
- The *Screen for Child Anxiety and Disorders*, SCARED (Birmaher, Suneeta Khetarpal, Marlane Cully, David Brent, and Sandra McKenzie, 1995)
- The Severity Measure for Generalized Anxiety Disorder (Craske, Wittchen, Bogels, Stein, Andrews, Lebeu, 2013)

We took into account in particular the *Cognitive Test Anxiety Scale* (Cassady, Johnson 2002) to design the basic structure of the questionnaire.

The *Cognitive Test Anxiety Scale* includes items that investigate a particular form of anxiety, the *cognitive test anxiety*.

Cognitive test anxiety is composed of individuals' cognitive reactions to evaluative situations, or internal dialogue regarding evaluative situations, in the times prior, or during, and after evaluative tasks. Thoughts commonly entertained by individuals dealing with high levels of cognitive test anxiety centre on (a) comparing self performance to peers, (b) considering the consequence of failure, (c) low levels of confidence performance, (d) excessive worry over evaluation, (e) causing sorrow for their parents, (f) feeling unprepared for tests, and (g) loss of self worth.

The 27 items *Cognitive Test Anxiety Scale* investigate these aspects of anxiety in evaluative situations (Cassady's questionnaire is available in the *Appendix*).

We analysed the Cassady's items and we decided to maintain several items (1, 2, 4, 5, 6, 7, 11, 12, 14, 15, 17, 18, 19, 20, 21, 23, 24, 25, 27).

For our purpose, we completed these list of questions with other items selected from the *Test Anxiety Scale* (Spielberger, Sarason, 1978: items 4, 10, 11, 15, 18, 20, 34) and from the *Screen for Child Anxiety and Disorders*, SCARED: items 5, 26, 39).

We translated the items into Italian. The language was adapted for our participants. Several items were modified in order to present questions that refer to the high school context rather than to university.

The final passage was to add four items in order to get further information:

- *Sento di non dover deludere gli altri.*
- *Prima di sostenere una prova non mi sento bene, sono agitato/a.*
- *Preferirei scrivere una tesina/un elaborato scritto che sostenere una prova per essere valutato/a.*
- *Inizio a sentirmi davvero inquieto/a prima di ricevere la scheda con le domande della prova.*

The final questionnaire consists of 33 items (it is fully available in the *Appendix*)

1. *Dormo poco quando so che devo affrontare una prova importante, perché sono preoccupato/a.*
2. *Nel sostenere una prova importante, mi capita di pensare: "forse gli altri studenti stanno facendo meglio di me".*
3. *Di solito mi blocco davanti a test e prove d'esame.*
4. *Sono meno nervoso/a per le prove rispetto agli altri studenti.*
5. *Durante le prove mi capita di pensare a cosa succederebbe se avessero un esito negativo.*
6. *All'inizio di una prova sono così nervoso/a che spesso non riesco a ragionare.*
7. *Mi preoccupa di piacere agli altri.*
8. *Sento di non dover deludere gli altri.*
9. *Quando sono sotto pressione per rispondere ad una domanda in un test scritto, mi capita di avere un vuoto di memoria.*
10. *Durante le prove penso di non dare il massimo.*
11. *Durante la prova spesso divento talmente nervoso/a da dimenticare cose che invece so.*
12. *Dopo aver sostenuto una prova, sento che avrei dovuto fare meglio di quanto ho fatto.*
13. *E' difficile per me parlare con persone che non conosco.*
14. *Prima di sostenere una prova, mi sento sicuro/a di me e rilassato/a.*
15. *Mentre svolgo una prova, mi sento sicuro/a di me e rilassato/a.*
16. *Durante le prove ho la sensazione di non lavorare bene.*
17. *Quando sostengo una prova difficile, mi sento sconfitto/a ancora prima di iniziare.*
18. *Trovare quesiti inattesi in una prova mi fa sentire inadeguato/a più che spaventato/a.*
19. *Mi sento nervoso/a quando mi trovo con persone che mi osservano mentre svolgo qualche attività (come leggere ad alta voce, parlare in pubblico...).*
20. *Appena ricevo la mia copia della prova, mi ci vuole un po' per calmarmi e capire da che punto iniziare a ragionare.*

21. *Mi sento davvero sotto pressione quando svolgo una prova e penso: "devo ottenere buoni risultati".*
22. *Non ho buone prestazioni nelle prove scritte.*
23. *Quando affronto una prova, il mio nervosismo mi fa commettere errori di distrazione.*
24. *Mentre sostengo una prova importante, mi capita di sudare molto.*
25. *Ottenere un buon risultato in una prova non sembra migliorare la mia fiducia per il successivo.*
26. *A volte sento che il mio cuore batte molto velocemente durante una prova importante.*
27. *Prima di sostenere una prova non mi sento bene, sono agitato/a.*
28. *Quando sostengo una prova, le mie emozioni non interferiscono con la mia prestazione.*
29. *Più mi impegno per sostenere una prova e più studio, più mi sento confuso/a.*
30. *Durante le prove spesso mi domando se concluderò il mio percorso scolastico.*
31. *Preferirei scrivere una tesina/un elaborato scritto che sostenere una prova per essere valutato/a.*
32. *La scuola/Università dovrebbe riconoscere che alcuni studenti sono più nervosi di altri durante le prove e che questo influisce sulla loro prestazione.*
33. *Inizio a sentirmi davvero inquieto/a prima di ricevere la scheda con le domande della prova.*

The following tab shows the different areas explored by the different items:

Anxiety (cognitive test anxiety)	Items: 1, 3, 4, 6, 9, 11, 14, 15, 20, 23, 24, 26, 27, 28, 29, 33
Social anxiety	Items: 7, 8, 13, 19
Expectancies	Items: 5, 10, 12, 21, 30
Self- esteem	Items: 2, 17, 18, 25, 29
Self- consciousness	Items: 16, 22, 31, 32
Further points	Items 31, 32

We use a 0 to 4 agreement scale for each item. The subjects were asked to select one agreement value.

0 = "completely not"

1 = "a bit"

2 = "fairly"

3 = "very much"

4 = "totally"

0 = per nulla 1 = poco 2 = abbastanza 3 = molto 4 = totalmente						
1	Dormo poco quando so che devo affrontare una prova importante, perché sono preoccupato/a.	0	1	2	3	4
2	Nel sostenere una prova importante, mi capita di pensare: "forse gli altri studenti stanno facendo meglio di me".	0	1	2	3	4
3	Di solito mi blocco davanti a test e prove d'esame.	0	1	2	3	4

7.3.2.2 The information sheet

The information sheet (available in the *Appendix*) was designed referring to a model: *The structured interview (Intervista strutturata)* designed by C.Solimando e L.Lami (2006).

The questions about the knowledge of educational measures for LD students refer to the directives of the Italian legislation (170/2010) and to the PDP, the Personalized Didactic Program (Piano Didattico Personalizzato).

Finally, our informative sheet (fully available in the *Appendix*) investigates:

- The age in which the first difficulties emerged (1)
- The reactions of school and families to the problems (2)
- The perception of the problem by the students (3)
- The most critical period experienced by the students (4)
- The use of speech-therapy (5)
- The knowledge of methodologies, strategies and special measures for LD (6)
- The use of exempting measures and compensatory instruments (7)
- The knowledge of projects supporting students with LD (8)
- The satisfaction about the format of the submitted investigation materials.

7.4 Results

In this section the objective outcomes of the research are presented. The factual results, generated from the data processing, are reported without any attempt of commenting them. Results are commented in the *Discussion*.

7.4.1 Questionnaire results table

In the following table all the results of the questionnaire are reported. The tab is useful to observe the scores of the single items and the scores of the subjects.

Items are distinguished on the basis of the particular areas investigated (the meaning of the different colors is explained in the legend at the bottom of the tab).

Soggetti	I	II	III	IV	V	VI	VII	VIII	IX	Totali per item /36	Medie per item
Items											
1	2	1	1	0	0	4	2	2	3	15	1,7
2	1	3	3	2	2	3	4	4	4	26	2,9
3	0	4	4	1	3	4	2	1	2	21	2,3
4*	1	4	3	4	4	4	2	4	4	30	3,3
5	0	3	1	4	2	4	3	4	2	23	2,5
6	0	4	1	0	1	4	1	2	2	15	1,6
7	1	3	2	0	2	4	3	4	4	23	2,5
8	2	3	2	0	2	4	3	1	3	20	2,2
9	0	4	3	2	3	4	2	3	3	24	2,7
10	0	3	1	0	0	4	3	2	2	15	1,7
11	0	3	4	2	3	4	2	2	3	23	2,6
12	2	4	2	2	2	3	3	3	4	25	2,8
13	1	3	1	0	0	2	4	4	4	19	2,1
14*	3	4	3	4	3	4	3	4	4	32	3,6
15*	3	4	3	1	2	4	3	3	4	27	3
16	0	2	1	0	0	4	3	1	4	15	1,7
17	0	2	2	0	2	3	3	1	4	17	1,9
18	0	2	1	0	4	4	3	1	2	17	1,9
19	2	4	2	4	0	3	4	4	4	27	3

20	0	4	1	0	3	3	1	0	2	14	1,6
21	2	4	2	0	3	3	2	1	4	21	2,3
22	0	2	1	1	0	3	3	1	2	13	1,4
23	0	4	3	1	3	4	3	1	4	23	2,5
24	0	1	0	0	0	4	1	4	1	11	1,2
25	2	0	1	0	1	2	3	4	2	15	1,7
26	0	3	2	1	2	4	1	1	4	18	2
27	1	3	2	2	2	4	3	4	3	24	2,7
28*	0	3	4	3	1	4	3	1	3	22	2,4
29	0	1	1	0	4	2	1	1	2	12	1,3
30	0	3	3	0	2	4	3	0	1	16	1,8
31	0	4	3	0	2	4	4	1	2	20	2,2
32	3	4	4	2	4	4	4	2	2	29	3,2
33	1	3	1	1	2	4	3	3	3	21	2,3
Somma per soggetto	27	99	68	37	64	119	88	74	97		
Media per soggetto	0,82	3	2,06	1,12	1,94	3,6	2,67	2,24	2,94		

Anxiety
Social anxiety
Self-esteem
Self-consciousness
Expectancies

* Items 4, 14, 15 and 28 report questions whose score has been reported as follows in order to obtain the “anxiety” level for each student.

0	1	2	3	4
4	3	2	1	0

7.4.1.1 Significant results tables

In this section the results that are more significant for our analysis are reported and represented in tables and in histograms.

09-17 Low value	18-27 Medium value	27-36 High value
--------------------	-----------------------	---------------------

I reported the histogram of the items that obtained a high value (plus item 2, which obtained 26).

2. Nel sostenere una prova importante, mi capita di pensare: “forse gli altri studenti stanno facendo meglio di me.”

While taking an important examination, I find myself wondering whether the other students are doing better than I am.

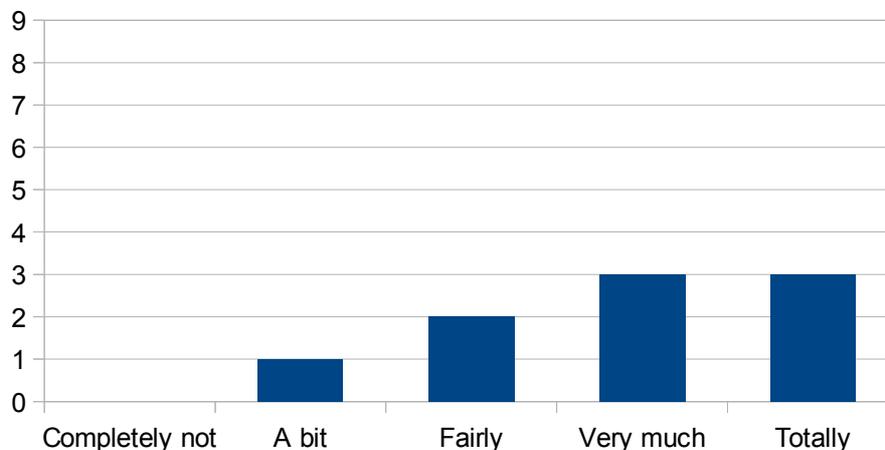
(Cassady and Johnson, 2002, p. 292).

This question investigates the self-esteem of a subject, focusing on the habit of comparing themselves with their peers during a proof. This behaviour may produce a prolonged stress, which may negatively affect the cognitive performance.

Number of selections (with rates) for each level of agreement

Per nulla (Completely not)	Poco (A bit)	Abbastanza (Fairly)	Molto (Very much)	Moltissimo (Totally)
0 (0%)	1 (11,1%)	2 (22,2%)	3 (33,3%)	3 (33,3%)

Total score: 26



4. Sono meno nervoso per le prove rispetto agli altri studenti.

I am less nervous about tests than the average college students.

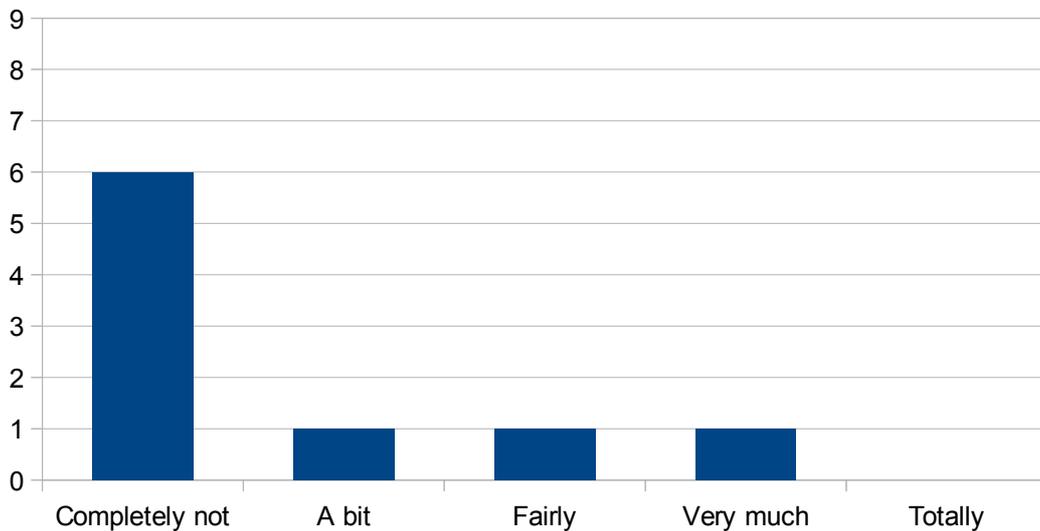
(Cassady and Johnson, 2002, p. 292)

This item investigates the subject's perception of his cognitive test anxiety level in comparison to the other students. The item presents a positive form.

Number of selections (with rates) for each level of agreement

Per nulla (Completely not)	Poco (A bit)	Abbastanza (Fairly)	Molto (Very much)	Moltissimo (Totally)
6 (66,7%)	1 (11,1%)	1 (11,1%)	1(11,1%)	0 (0%)

Total score: 30



Notes

Results show a high percentage of “completely not” answers (6/9; 66,7%).

14. Prima di sostenere una prova mi sento sicuro di me e rilassato.

Before taking a test, I feel confident and relaxed

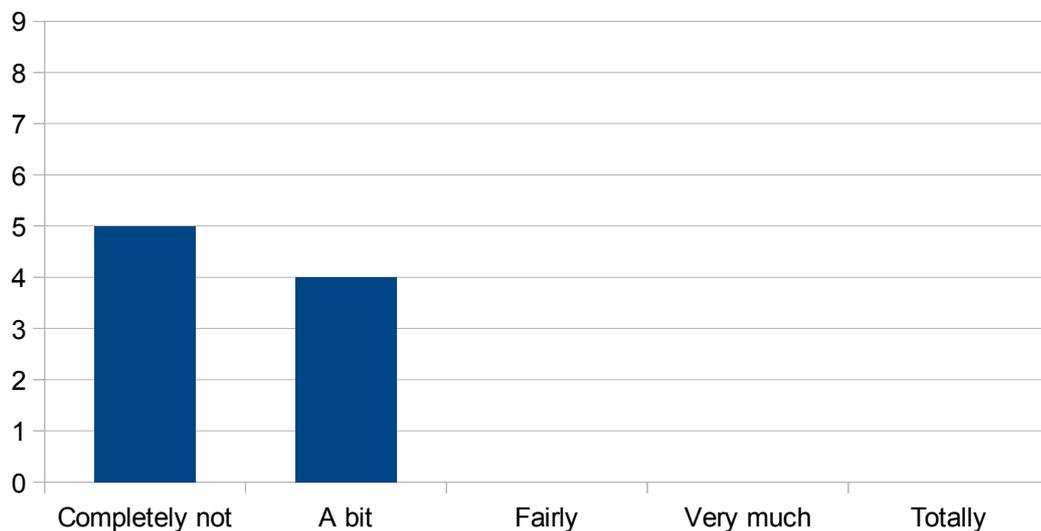
(Cassady and Johnson, 2002, p. 293)

In this case too, the item is presented in a positive form.

Number of selections (with rates) for each level of agreement

Per nulla (Completely not)	Poco (A bit)	Abbastanza (Fairly)	Molto (Very much)	Moltissimo (Totally)
5 (55,6%)	4 (44,4%)	0 (0%)	0 (0%)	0 (0%)

Total score: 32 (this is the highest value of the questionnaire)



Notes

Results show a high percentage of “completely not” and “a bit” answers (respectively 5/9, 55,6% and 4/9, 44,4%). Students report not to have a positive mental state before the proofs.

15. Mentre svolgo una prova, mi sento sicuro di me e rilassato

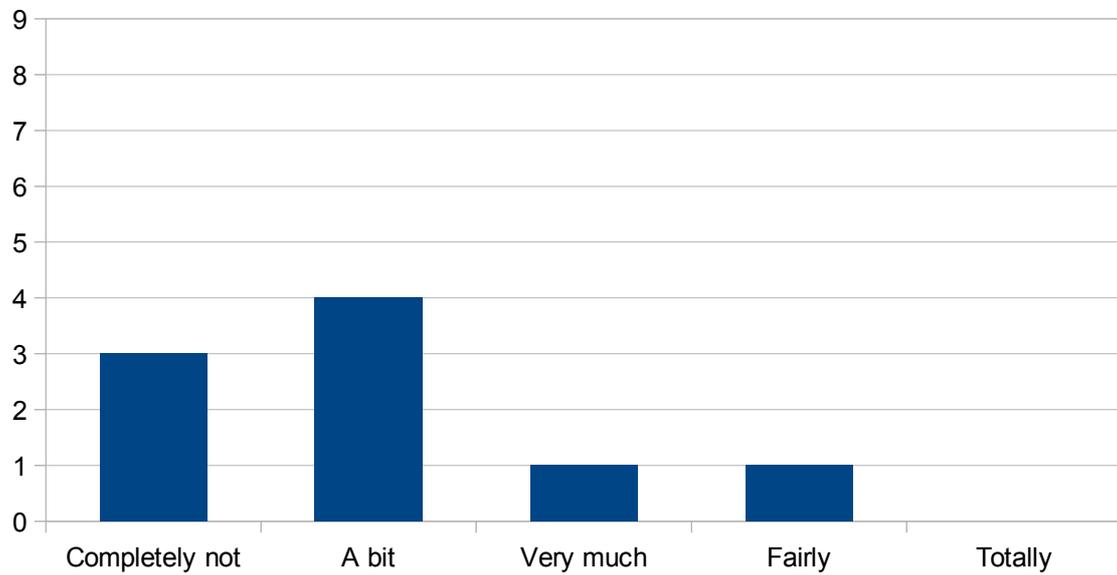
While taking a test, I feel confident and relaxed

(Cassady and Johnson, 2002, p. 293)

In this case too, the item is presented in a positive form.

Per nulla (Completely not)	Poco (A bit)	Abbastanza (Fairly)	Molto (Very much)	Moltissimo (Totally)
3 (33,3%)	4 (44,4%)	1 (11,1%)	1 (11,1%)	0 (0%)

Total score: 27



32. La scuola/università dovrebbe riconoscere che alcuni studenti sono più nervosi di altri durante le prove e che questo influisce sulla loro prestazione.

The University ought to recognize that some students are more nervous than other about tests and that this affects their performance

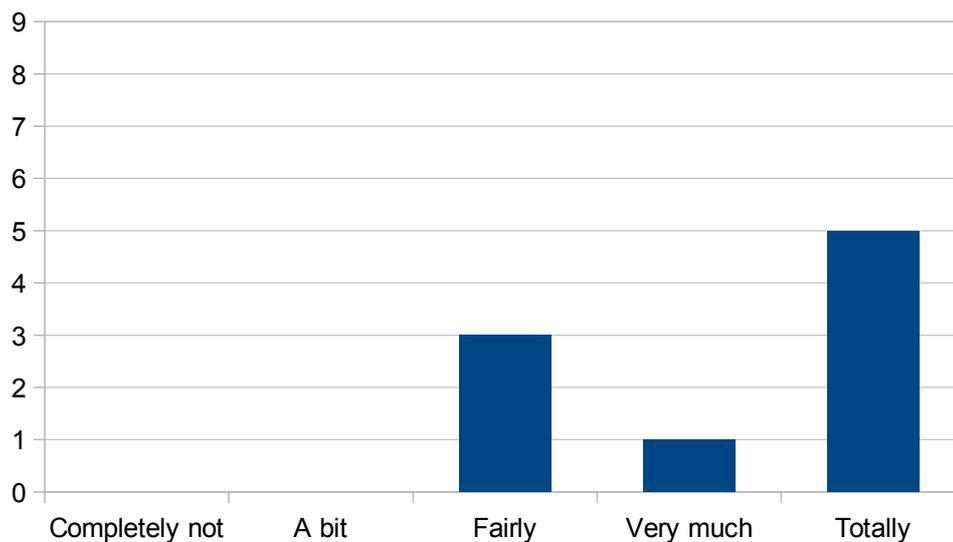
(Spielberger and Sarason, 1978, p. 200)

The items investigates whether students with learning disabilities think that school should take into account the presence of cognitive test anxiety.

Number of selections (with rates) for each level of agreement

Per nulla (Completely not)	Poco (A bit)	Abbastanza (Fairly)	Molto (Very much)	Moltissimo (Totally)
0 (0%)	0 (0%)	3 (33,3%)	1 (11,1%)	5 (55,6%)

Total score: 29



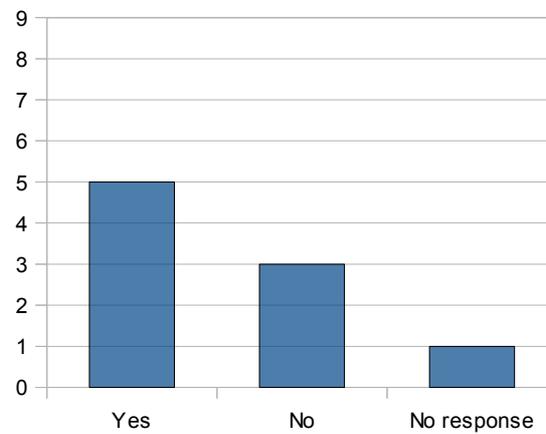
7.4.2 Information sheet

7.4.2.1 Quantitative analysis, tables

Ha usufruito di un intervento logopedico?

(Have you received speech-therapy?)

yes	no	No response
5 (55,6%)	3 (33,3%)	1 (11,1%)

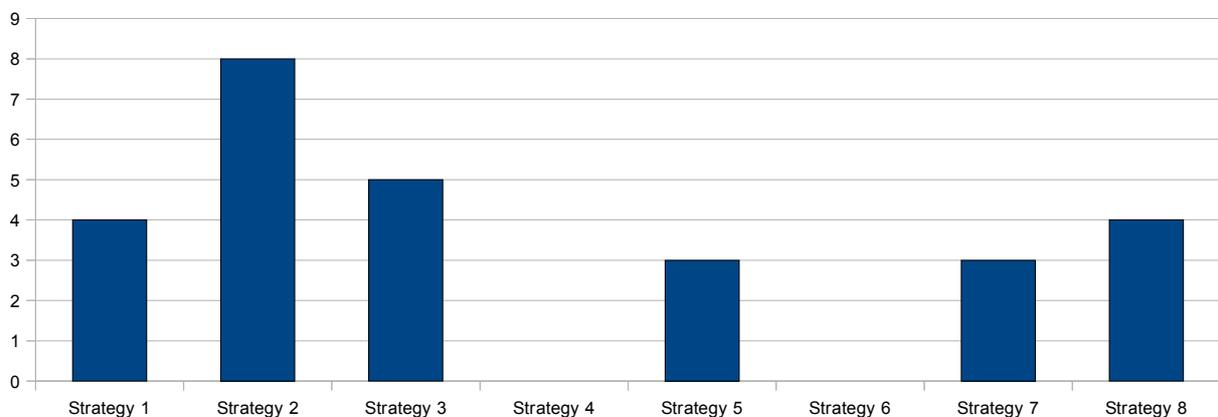


La normativa vigente prevede l'adozione di consone strategie metodologiche e didattiche da parte della scuola. Quale o quali tipologie può riconoscere?

(The current regulation provides that schools adopt consistent methodological and educational strategies. How many strategies do you recognize?)

1. *Valorizzazione, nella didattica, di linguaggi comunicativi diversi dal codice scritto (immagini, parlato)*
(Alternative teaching tools)
2. *Utilizzo di schemi e mappe concettuali*
(Using schemes or maps)
3. *Insegnamento dell'uso di strategie extra testuali per lo studio (paragrafi, immagini, evidenziatore)*
(Extra-textual strategies)
4. *Collegamenti fra le nuove informazioni e quelle già acquisite ogni volta che si inizia un nuovo argomento di studio*
(Links between acquired information and new information)
5. *Divisione degli obiettivi di un compito in sotto-obiettivi*
(Subdivision of tasks)
6. *Offerta anticipata di schemi grafici relativi all'argomento, per orientare l'alunno nella discriminazione delle informazioni essenziali*
(New material prepared in advance)
7. *Esperienze pratiche, laboratori*
(Practical laboratories)
8. *Promozione dell'apprendimento collaborativo o in piccoli gruppi*
(Teamwork)

Strategy 1	Strategy 2	Strategy 3	Strategy 4	Strategy 5	Strategy 6	Strategy 7	Strategy 8
4	8	5	0	3	0	3	4

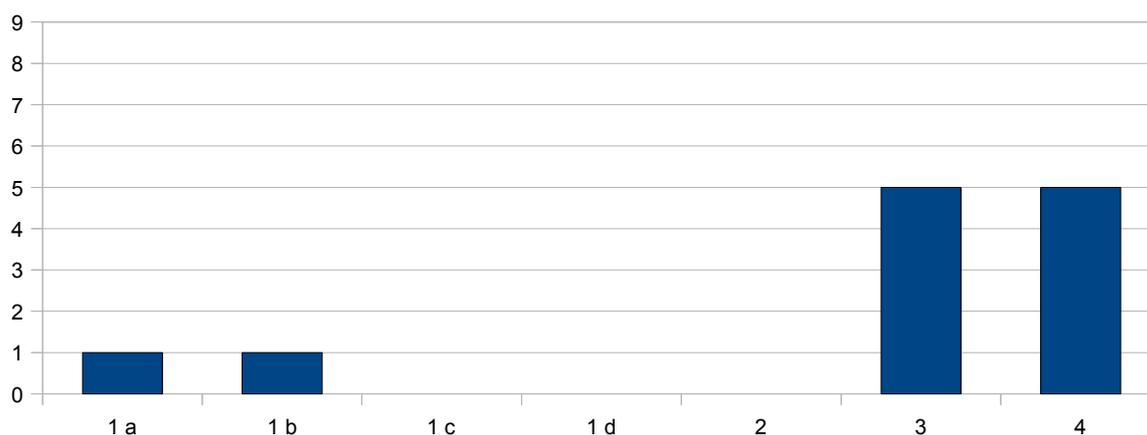


I singoli docenti hanno previsto e adottato:

(Teachers adopted...)

1. *Misure dispensative a) evitare lettura ad alta voce b) regolare i tempi per le prove c) alleggerire il carico dei compiti per casa d) evitare studio mnemonico*
(Exempting measures a) no aloud-reading b) regulations of time in proofs c) less homework d) no mnemonic study)
2. *Strumenti compensativi (libri digitali, computer, audiolibri, software free, sintesi vocale)*
(Compensatory tools: digital books, audio books, software free, vocal devices)
3. *Modalità di verifica adattate*
(personalized criteria in submitting proofs)
4. *Criteri di valutazione adattati*
(personalized criteria in evaluation)

1a	1b	1c	1d	2	3	4
1	1	0	0	0	5	5



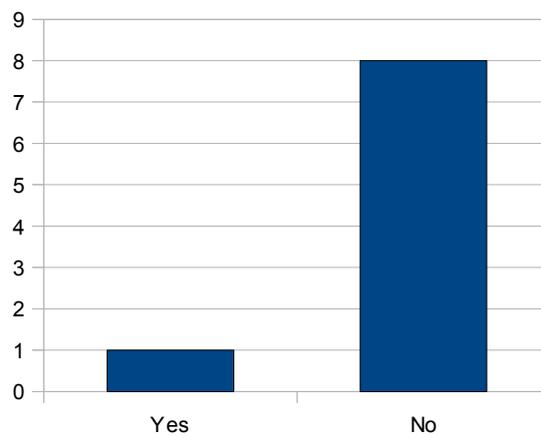
Notes

I underline that none of the students reports to use compensatory tools at school (0 on point 2).

E' a conoscenza di progetti e iniziative per la dislessia e i DSA in territorio nazionale o nel suo territorio?

(Do you know any project supporting dyslexia available in the place you live?)

yes	no
1 (11,1%)	8 (88,9%)



Notes

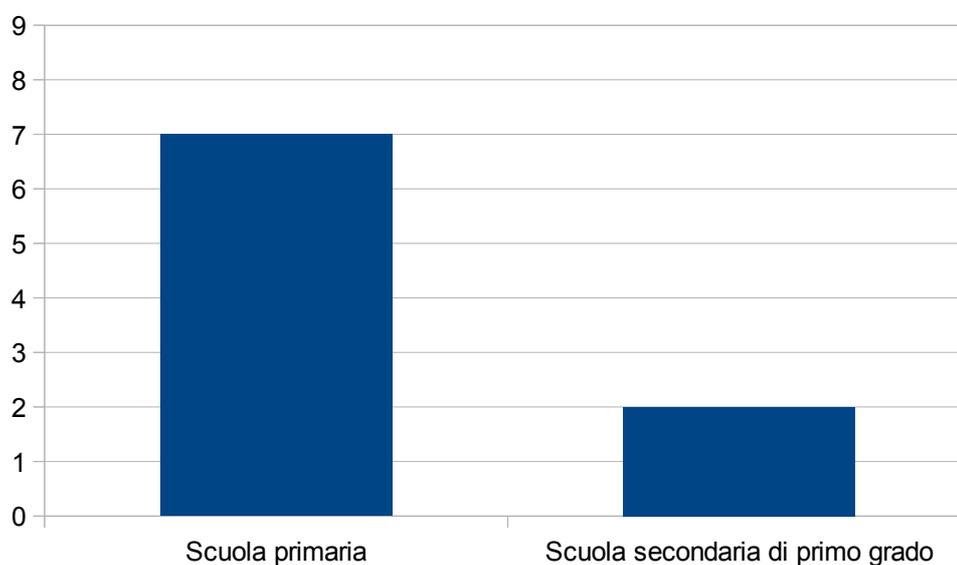
I underline that only one student reports to know a project supporting dyslexia.

7.4.2.2 Responses to open questions

A quale età sono emerse le prime difficoltà scolastiche?

(When did the first difficulties manifest?)

Scuola primaria (primary school)	Scuola secondaria di primo grado (secondary school, 11-14 years)
7 (77,8%)	2 (22,2%)



Com'è stato affrontato il problema dalla famiglia e dalla scuola?

(How do your family and your school face the problem?)

Family is described as concerned about the problems, while school is reported to attribute the difficulties to a general laziness.

Come ha personalmente vissuto il problema?

(How did you face the problem?)

Students report several emotions and behaviours. It is difficult to provide an exact

report of the students' responses. I decide to summarize the students' considerations without quantifying them.

Students report several emotions and behaviours:

- low self-esteem
- self closure in the school context
- avoidance of the school requests
- anxiety
- sensation of failure
- shame
- feeling “stupid”

Quale è stato il momento più critico del suo percorso scolastico?

(When did you live the most critical period in your school-age?)

The students report different critical periods (in the course of primary and secondary school).

Commenti personali

(Personal remarks)

In this section I report several comments reported by the students.

“La scuola in generale dovrebbe tenere più in considerazione gli studenti con DSA e dovrebbe sostenerli di più, magari con un docente specializzato che li aiuti solo nella materia in cui il problema persiste, aiutando così anche il docente che spesso non può dedicare attenzione allo studente perchè ha già una classe da seguire.” (student, female, 17 years old)

“Io non chiedo di essere trattata in modo diverso perchè mi sentirei inferiore agli altri, però (...) I professori dovrebbero sapere delle difficoltà di noi ragazzi anche

nelle relazioni e non farci sentire in minoranza e stupidi che è la forma di disabilità più brutta che un ragazzo/una ragazza può sentirsi di avere.” (student, female, 18 years old)

“Il sostegno c'è, ma non da parte di tutti; vorrei andare all'università, ma ho paura di non farcela.” (student, female, 18 years old)

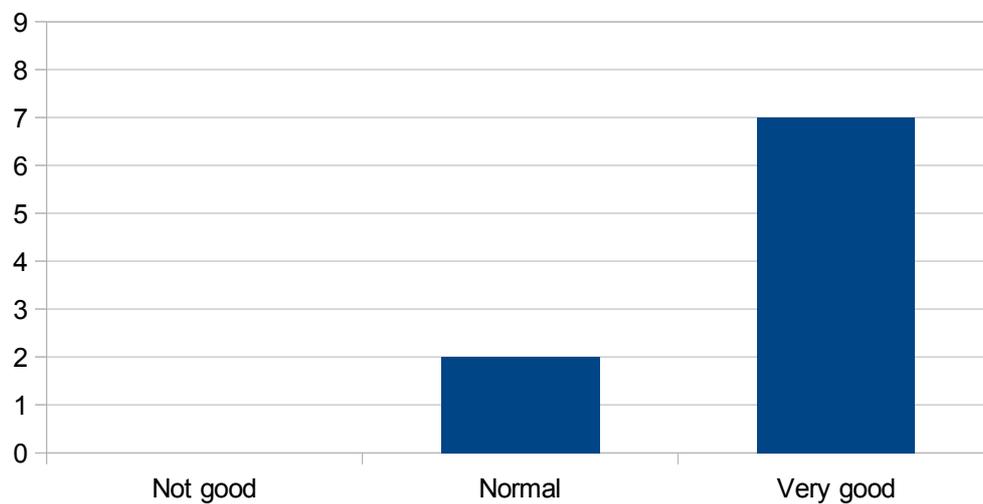
“Dopo varie visite, controlli, prove affrontate da me con paura, mi ritrovo, ora che sono in V, senza nessun aiuto” (student, female, 18 years old)

7.4.2.3 Questionnaire satisfaction survey

At the bottom of the questionnaire, students were asked to express a view of the design of the submitted investigation instruments:

Le chiediamo di esprimere un semplice giudizio sulla leggibilità e la
presentazione grafica del questionario e della scheda.
(I ask you to express a view of the graphical presentation of the questionnaire and of the sheet)

Not good	Normal	Very good
0	2	7



7.5 Discussion

7.5.1 Questionnaire

The results show high scores in several items (those I reported in graphics).

Students report a high level of **general anxiety** in proofs: in the item 4 (total score: 30; mean: 3,3) almost all the students selected 0 (calculated as 4 in the data elaboration, because the question was submitted in the positive form).

Anxiety problems are reported to be experimented before (item 14, total score: 32; mean: 3,5) or after the performance (item 15, total score: 27; mean: 3). Items 14 and 15 were submitted in the positive form.

Social anxiety: we notice a high score on the item 19 (total score: 27; mean: 3), that investigates the presence of social anxiety in situations in which the subject is observed while doing activities.

Expectancies: subjects report high levels of negative emotions on item 12: they report to dwell after a proof on the fact that they should have done a better performance. Probably they are afraid of disappointing their expectancies and those of their parents/teachers.

Self esteem: item 2 presents a considerable score (total score: 26; mean: 2,8). Students report to be worried by the fact that their performance may be worse than the performances of their colleagues.

Self-consciousness: the participants don't show relevant results.

Item 32 obtained a high score (total score: 29; mean: 3,2). It doesn't investigate a particular form of anxiety, but asks the students if, in their opinion, school should take into account the fact that being nervous during proofs may have a negative effect on the performances of students.

7.5.2 Information sheet

The information sheet shows several interesting results.

Students report primary school (scuola primaria) or secondary school (scuola media) as the main periods in which their difficulties emerged.

Families are reported to have faced the problem with attention and worry, while at school the difficulties most of the times were attributed to a general laziness rather

than to a specific learning problem.

The subjects report several emotional problems caused by their difficulties: low self esteem, feelings of being inferior, self closure, anxiety, sensations of failure, shame and fear of being defined “stupid”.

The section investigating the use of strategies, tools and project presents important data. Almost all the students report to use schemas or maps in studying, while other strategies suggested by the PDP seem to be less utilized.

None of the students report to utilize technological compensatory instruments (even when they are simply available and free).

Only one student reports to know a project supporting people with dyslexia, because this subject participated in the activities proposed by this project.

The further comments of the students confirm what emerges from our investigation: students require more attention to their learning problems and to their emotions, in order to be included in the school context, to grow their self esteem and to face the future with more security.

7.5.3 Questionnaire satisfaction survey

The responses to the questionnaire satisfaction survey show a good approval rating about the formal design of the materials.

7.6 Conclusions

Subjects report several emotional difficulties caused by their learning diseases (anxiety, low self-esteem, fear of being defined “stupid”...). These negative emotions have a bad effect on their lives.

Their school experiences were marked by these problems, despite the support received from their families and from the school.

Schools adopt different measures and instruments in accordance with the Italian legislation as far as possible depending on the different cases (availability of resources, time...).

An important fact that emerged is that all the students have never utilized

technological compensatory instruments at school.

Despite the fact that a good study method and specific strategies may help in overcoming the limits caused by dyslexia and LD, technological compensatory tools may help in increasing autonomy. These are simply available and in most cases they are free or low priced.

Only one student refers to know a project that supports dyslexic people and to have received services from that service.

There are a large number of project supporting people with LD in Italy as I indicated in chapter 6 and they are spread in throughout the territory of Italy.

These project are important because they provide counselling, support and specific services for people with learning difficulties and for their families.

Students require attention to school, not only to their learning problems, but also to the emotional consequences. School is one of the main context in which teenagers develop their self concept, confronting themselves with their peers. The potentials and the characteristics of student with LD should be considered.

From this study several guidelines emerged in supporting LD students:

- Students with dyslexia require attention to their learning problems as well as to their emotional difficulties;
- exception measures and compensatory instruments are crucial for students with LD;
- students should be informed of the existence of a large number of technological tools supporting LD and of the project activated on the territory.

7.6.1 Suggestion for further research

Further research should undoubtedly involve a larger number of subjects and it should be important to compare the results of groups of students of different schools.

Involving university students and workers with LD may help in understanding how the difficulties (cognitive and emotional) change with age.

General conclusions

LD as learning lifelong characteristics

Referring to the considerations presented in this study (the existent definitions, the different theories explaining LD and the concept of neurodiversity), to the previous studies and to our investigation, we finally purpose a definition for LD.

Those which are officially recognized as Learning disabilities/difficulty/disorders may be defined as subjective cognitive characteristics regarding the domains of reading, writing and calculating in people without other cognitive/intellectual problems, without sensory deficits or psychological and social difficulties.

In particular if we refer to adolescence and adulthood, these problems regard the automatization of one or more learning processes. They affect the whole lives of the individuals.

LD cause problems not only to the learning processes, but also to the emotional life of a subject. They may cause internalizing problems, in particular anxiety, and feelings of low self-esteem.

These problems may get worse if they are not diagnosed promptly or if the subject doesn't receive an adequate support.

Suggestions for a good inclusive education

The results of our investigation provide several suggestions useful to understand how to improve education for students with specific learning disorders. We can extract several key-words:

- **Cognition, neurodiversity and learning-styles**

The identification of strengths and weaknesses is crucial in planning a personalized program for LD students. School should take into account not only the “negative” aspects of dyslexia and LD (the diagnosed cognitive problems), but also (and above all if we refer to adolescents and adults) the

learning styles of the students, that is the “positive” aspect of learning disorders, because they pertain to subjective and lifelong cognitive characteristics (neurodiversity).

- **Inclusion**

Students with LD should be well included in their classes. Their fear of being considered “different” should be reduced. All the student should be informed about dyslexia and LD. There is a large number of books and websites that provide materials useful to explain dyslexia and the other learning disorders.³⁴ Teamwork, in which students can share their different competences may be an important aid for inclusion.

- **Family**

The constant communication family – school is an important component in planning a good educational program.

- **Emotional factors**

The emotional effects of LD should be taken into account. *Cognitive test anxiety*, which frequently occur before proofs (as the results of our study show) should be considered an influential factor in student's performances as well as the other (and best known) cognitive factors.

- **Compensation and technologies**

Compensatory tools should be actually taken into account. The whole class should be informed about the existence of these instruments. Technology may offer a consistent aid to LD students as well as to the other students. Digital books and other aids (web resources, sharing electronic texts, using video resources) may help all the students in their learning process.

34 I. e. Cutrera, <http://www.aiutodislessia.net/wordpress/wp-content/uploads/2013/12/La-Mia-Dislessia-slide-e-esempi.pdf>

Cooperation

Scientific research	Neurodiversity
Medical classifications	Cognitive styles
Explanatory models	Learning styles
Theories	Compensation

These two areas represent two different approaches as we have seen. However, both of them are crucial in supporting people with specific learning characteristics. The scientific research's efforts to explain the underlying cognitive, neurological and biological causes of LD are crucial for a correct and prompt diagnosis, for the treatment and for the development of the knowledge of this matter.

On the other side, the more recent research on neurodiversity and on the different learning styles is important to design accessible educational programs and effective compensatory tools useful for the inclusion of dyslexic and LD people at school and (for the future) in their workplace.

Appendix

I Assessment tools

Instructions

Questionnaire

Information sheet

ISTRUZIONI PER LA COMPILAZIONE

1. Questionario rivolto a studenti con diagnosi DSA

Ansia in ambiente scolastico/universitario

Gentile studente/studentessa,

La preghiamo di rispondere alle domande del questionario, chiedendo di non omettere alcuna risposta.

Il questionario è costituito da una serie di item che riguardano la sua esperienza scolastica/universitaria (prove scritte). Il suo compito sarà quello di indicare in che misura la sua valutazione o la sua concordanza corrisponde ad uno dei gradi espressi dalla scala indicata a margine.

Lei cioè, in corrispondenza a ciascuna affermazione, dovrà tracciare una crocetta sul numero (0) se riterrà di non essere per nulla d'accordo con quell'affermazione, e così via, fino a (4) se riterrà di essere massimamente d'accordo con quell'affermazione.

Ecco la scala di valutazione mediante cui esprimere il suo grado di accordo con la singola affermazione:

- 0 - Per nulla d'accordo**
- 1 - Poco d'accordo**
- 2 - Abbastanza d'accordo**
- 3 - Molto d'accordo**
- 4 - Totalmente d'accordo**

La preghiamo di esprimere un singolo giudizio per ogni scala. Se

ritenesse di dover correggere la sua valutazione, erroneamente espressa, faccia un cerchio attorno al numero che ha erroneamente indicato ed esprima con una crocetta il nuovo giudizio.

2. Scheda informativa

Alla fine del questionario è allegata una scheda nella quale sono richieste alcune informazioni socio-demografiche e scolastiche che, in ogni caso, non riducono il carattere anonimo della rilevazione.

Quindi non riporti in nessuna parte il suo nome e cognome

La ringrazio per la sua cortese collaborazione

Irene Rizzato

1. Questionario

0 = per nulla 1 = poco 2 = abbastanza 3 = molto 4 = totalmente

1	Dormo poco quando so che devo affrontare una prova importante, perché sono preoccupato/a.	0	1	2	3	4
2	Nel sostenere una prova importante, mi capita di pensare: "forse gli altri studenti stanno facendo meglio di me".	0	1	2	3	4
3	Di solito mi blocco davanti a test e prove d'esame.	0	1	2	3	4
4	Sono <i>meno</i> nervoso/a per le prove rispetto agli altri studenti.	0	1	2	3	4
5	Durante le prove mi capita di pensare a cosa succederebbe se avessero un esito negativo.	0	1	2	3	4
6	All'inizio di una prova sono così nervoso/a che spesso non riesco a ragionare.	0	1	2	3	4
7	Mi preoccupo di piacere agli altri.	0	1	2	3	4
8	Sento di non dover deludere gli altri.	0	1	2	3	4
9	Quando sono sotto pressione per rispondere ad una domanda in un test scritto, mi capita di avere un vuoto di memoria.	0	1	2	3	4
10	Durante le prove penso di non dare il massimo.	0	1	2	3	4
11	Durante la prova spesso divento talmente nervoso/a da dimenticare cose che invece so.	0	1	2	3	4

12	Dopo aver sostenuto una prova, sento che avrei dovuto fare meglio di quanto ho fatto.	0	1	2	3	4
13	E' difficile per me parlare con persone che non conosco.	0	1	2	3	4
14	Prima di sostenere una prova, mi sento sicuro/a di me e rilassato/a.	0	1	2	3	4
15	Mentre svolgo una prova, mi sento sicuro/a di me e rilassato/a.	0	1	2	3	4
16	Durante le prove ho la sensazione di non lavorare bene.	0	1	2	3	4
17	Quando sostengo una prova difficile, mi sento sconfitto/a ancora prima di iniziare.	0	1	2	3	4
18	Trovare quesiti inattesi in una prova mi fa sentire inadeguato/a più che spaventato/a.	0	1	2	3	4
19	Mi sento nervoso/a quando mi trovo con persone che mi osservano mentre svolgo qualche attività (come leggere ad alta voce, parlare in pubblico...).	0	1	2	3	4
20	Appena ricevo la mia copia della prova, mi ci vuole un po' per calmarmi e capire da che punto iniziare a ragionare.	0	1	2	3	4
21	Mi sento davvero sotto pressione quando svolgo una prova e penso: "devo ottenere buoni risultati".	0	1	2	3	4
22	Non ho buone prestazioni nelle prove scritte.	0	1	2	3	4
23	Quando affronto una prova, il mio nervosismo mi fa commettere errori di distrazione.	0	1	2	3	4

24	Mentre sostengo una prova importante, mi capita di sudare molto.	0	1	2	3	4
25	Ottenere un buon risultato in una prova non sembra migliorare la mia fiducia per il successivo.	0	1	2	3	4
26	A volte sento che il mio cuore batte molto velocemente durante una prova importante.	0	1	2	3	4
27	Prima di sostenere una prova non mi sento bene, sono agitato/a.	0	1	2	3	4
28	Quando sostengo una prova, le mie emozioni <i>non</i> interferiscono con la mia prestazione.	0	1	2	3	4
29	Più mi impegno per sostenere una prova e più studio, più mi sento confuso/a.	0	1	2	3	4
30	Durante le prove spesso mi domando se concluderò il mio percorso scolastico.	0	1	2	3	4
31	Preferirei scrivere una tesina/un elaborato scritto che sostenere una prova per essere valutato/a.	0	1	2	3	4
32	La scuola/Università dovrebbe riconoscere che alcuni studenti sono più nervosi di altri durante le prove e che questo influisce sulla loro prestazione.	0	1	2	3	4
33	Inizio a sentirmi davvero inquieto/a prima di ricevere la scheda con le domande della prova.	0	1	2	3	4

2. Scheda informativa

Studenti/adulti con diagnosi DSA

INFORMAZIONI INIZIALI

Sesso F M

Grado di scolarità (se si vuole, specificare il tipo di scuola superiore, diploma o facoltà):

- Superiore, classe.....
- Laurea triennale.....
- Laurea magistrale.....
- Dottorato.....
- Altro, specificare.....

PERCORSO SCOLASTICO

Pensando al suo percorso scolastico, risponda brevemente alle seguenti domande:

1. **A quale età sono emerse le prime difficoltà scolastiche?**

.....

2. **Come è stato affrontato il problema dalla famiglia e dalla scuola?** (Inizialmente è stato considerato svogliato o con problemi di relazione e così via?).

.....
.....
.....

3. **Come ha personalmente vissuto il problema?** (Sentimenti di incapacità, di scarsa autostima, di opposizione alle richieste scolastiche e così via).

.....
.....
.....

4. Qual'è stato il momento più critico del suo percorso scolastico?

.....
.....
.....

5. Ha usufruito di un intervento logopedico? sì no

Se sì, per quanto tempo?

.....

CONOSCENZA DI STRUMENTI E PROGETTI

L'ultima sezione riguarda la presenza nella scuola di strategie e strumenti per la didattica. Risponda in base alla sua esperienza scolastica attuale:

6. La normativa vigente prevede l'adozione di consone strategie metodologiche e didattiche da parte della scuola.

Quale o quali tipologie può riconoscere?

Valorizzazione, nella didattica, di linguaggi comunicativi diversi dal codice scritto (immagini, parlato)

Utilizzo di schemi e mappe concettuali

Insegnamento dell'uso di strategie *extra-testuali* per lo studio (paragrafi, immagini, evidenziatore)

Collegamenti fra le nuove informazioni e quelle già acquisite ogni volta che si inizia un nuovo argomento di studio

Divisione degli obiettivi di un compito in *sotto-obiettivi*

- Offerta anticipata di schemi grafici relativi all'argomento di studio, per orientare l'alunno nella discriminazione delle informazioni essenziali.
- Esperienze pratiche, laboratori
- Promozione dell'apprendimento collaborativo o in piccoli gruppi

Ha potuto dunque fruire di una didattica personalizzata per l'individuazione di un percorso curricolare differenziato, adatto al suo stile di apprendimento?

- sì no

7. I singoli docenti hanno previsto e adottato:

- misure dispensative (evitare lettura ad alta voce, regolare i tempi per le prove, alleggerire il carico di compiti per casa, evitare lo studio mnemonico)
- strumenti compensativi, indicare quali (libri digitali, computer, audiolibri, software free sintesi vocale)
- modalità di verifica adattate
- criteri di valutazione adattati

8. E' a conoscenza di progetti e iniziative per la dislessia e i DSA in territorio nazionale o nel suo territorio? sì no

Se sì, quali progetti conosce?

.....

.....

.....

.....

9. **SPAZIO PER I COMMENTI PERSONALI** (ad. es. "Sente di essere adeguatamente sostenuto nel suo percorso scolastico? Cosa fa/non fa la Scuola/l'Università e cosa potrebbe fare per facilitare i percorsi di apprendimento di studenti con DSA ?").

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Infine, le chiediamo di esprimere un semplice giudizio sulla leggibilità e la presentazione grafica del questionario e della scheda:



La ringrazio per la sua cortese collaborazione!

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(29/05/2015)

AID Italia

<http://www.aiditalia.org/>
(29/05/2015)

AID Italia

http://www.aiditalia.org/upload/profumo_1.pdf
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British Dyslexia Association

<http://www.bdadyslexia.org.uk/educator/what-are-specific-learning-difficulties>
(29/05/2015)

Easy Reading

<https://www.youtube.com/watch?v=njWAXeGeB6E>
(29/05/2015)

Learning disabilities association of Canada

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Naama Friedmann
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Pictures

1. Examples of reading difficulties faced by people with dyslexia
2. Example of dysgraphia
3. Example of dysortography
4. Example of dysortography 2
5. Example of problems in dyscalculia
6. Written numbers in dyscalculia; calculating problems
7. The Vellutino's model of reading processes and skills
8. Working memory processes
9. Brain's areas
10. Reading and the brain
11. Broca's and Wernicke's areas
12. The dual route model of reading
13. Synopsis of writing processes
14. Letters floating in dyslexia
15. The visual cortex with the optic nerve and the lateral geniculate nucleus

16. Nicolson and Fawcett, 2010: Magnocellular deficit
17. The cerebellum
18. Trait-anxiety and state-anxiety
19. Learning styles
20. One of them doesn't want to ride the bike