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Dyslexia in Italian.

A phonological approach and original teaching materials.

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Introduction

«To begin with the end in mind means to start with a clear understanding of your destination.

It means to know where you're going so that you better understand where you are now
so that the steps you take are always in the right direction».

(Stephen R. Covey)

What techniques for language assessment?

Those who are affected by language disorders and specific language impairment have significant difficulties on several linguistic and/or communicative domains. One could probably say that there are as many language tests as many language, cognitive, and metacognitive abilities taken into account – if not more.

More interestingly, a preliminary question could be: “What is a *test*?”.

According to the Oxford Dictionary of English Etymology (1966), *test* comes from the Latin *testū*, *testum* meaning “earthen pot”. It appeared in English in the late XIV century as a noun meaning of “cupel used in threatening gold and silver alloys or ore”, thus to verify their authenticity, their goodness. Two centuries later, it started to be used as a verb meaning “means of trial”, so again, a particular process or method for trying or assessing the quality of something. This meaning is shared also by the word *exam*, short form for *examination*. It is probably because of this if today a test defines an object, or an individual, in a negative way, that is “what you *cannot* do, how you are *not*”, or “you are *incapable* of something, you are *unable* to do something”.

General or specific?

Tomblin (2008) describes the assessment problem according to different perspectives. A naturalist point of view considers language impairment as a deviation from the average level of ability which a similar group of people normally achieve. This would refer to a broad range of language behaviours and across different modalities. So what language behaviours should be considered as

deviant? What level of competence should be considered as potentially impaired? Should we rely on the chronological age expectations, or on the general level of cognitive ability? From a normative point of view, what is taken into account are society's values and expectations concerning individual behaviour. We can talk of language impairment, or disorder, when it prevents individuals' ability to meet social expectations as well as their own needs and desires. This could include difficulties with social relationships, academic achievement, and future employment prospects.

A better question might be: "Why is there a need for so many different tests to measure different aspects of developing and functioning?". This question has more than one possible answer.

First: Since language is a complex system that relies on the interconnection of several branches including phonology, morphology, grammar, syntax, and pragmatics, there is *at least* one test that identifies, assesses and evaluates each parameter, differently and separately.

Second: According to the researcher, or researchers, that designed and developed them, tests may reflect different perspectives that determine different clinical or interventionist approaches.

Third: We need different tests because such disorders do affect *language*, *speech* and *communication* domains. Although the impairment may be restricted to one area, it might well influence general competence and development. Moreover, individuals may overcome impaired speech, for example, by adding gestures and reformulating spoken output in order to make themselves understood. Thus, *language*, *speech* and *communication* do not always go together.

Instruments for cognitive and linguistic assessment

Here is a list of the cognitive and linguistic areas most commonly tested for Italian (Cornoldi, 2007, p. 34):

PERCEPTION

Perception	Visual Perception Test (Hamill, Pears, and Foress)
Visuoconstructive ability	Visual-Motor Integration Test (Beery and Buktenica)
Auditory discrimination	Neuropsychological Assessment Battery, age 5-11
Temporal perception	

ATTENTION

Sustained attention	Neuropsychological Assessment Battery, age 5-11
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ELABORATION SPEED

Execution speed	Wechsler Intelligence Scale for Children III
Word access speed	Rapid Automatized Naming

LANGUAGE

Phonological awareness	Test for Reading and Writing Difficulties 2, Neuropsychological Assessment Battery, age 5-11, Metaphonological Competence Test
Vocabulary	Peabody Picture Vocabulary Test-R, Phonolexical Test
Syntactic comprehension	Receptive Grammar Test (Rustioni)
Oral comprehension of texts	Levorato-Roch task
Definition ability	Wechsler Intelligence Scale (Belacchi-Benelli task)

WORKING MEMORY

Phonological memory	Preliminary Criteria Assessment (Brizzolata, Vicari, Bilancia)
Visuospatial memory	Corsi, Battery of Evaluation of Metavision
Active processes	Listening span

LONG-TERM MEMORY

Associative memory	Memory and Learning Test
Story memory	Neuropsychological Assessment Battery, age 5-11
Study ability	

METACOGNITION

Knowledge of the mind

Strategies

Self-regulation

EXECUTIVE FUNCTIONS

Neuropsychological Assessment Battery

Planning/problem solving

Tower of London Test

Categorization

Wisconsin (Card Sorting) Test

Pathologies and diseases in a strict medical sense can be investigated in different ways, according to the specific case. Several factors, such as age, sex, damages, health conditions, can influence the decision for a certain technique instead of another.

Consequently, having patients undergo an unnecessary, when not useless or damaging, evaluation may seriously compromise patients' life. Similarly, when evaluating language competence, or trying to provide a diagnosis of a supposed language disorder, the professional in charge should be very accurate in the choice of the test.

Etiology, symptoms, and standardized tests

One must never propose that, as some *linguistic* populations have the same linguistic difficulties (in other words that they make the same errors), they could possibly be diagnosed and treated in the same way. Such an approach would be incorrect, ineffective and unethical under many points of view. For example, in the case of specific language impairment/disorder, and deafness, or aphasia, they both show similar speech and language difficulties, but for different reason. In fact, the former are biological and congenital disorders, while the second are physical, acquired deficits, or damages. Thus, what is primarily different is the etiology. Second, an early detection leading to an immediate intervention can come only after a complete assessment of cognitive, linguistic, and communicative abilities. If this does not happen, then children may not be diagnosed, and never receive proper treatment and remediation.

Moreover, an error analysis conducted in a generative grammar perspective provides further, deeper explanations for the different syntactic representations that these individuals assume (Friedmann et al., 2006; Friedmann and Novogrodsky, 2007).

However, it is not uncommon that tests standardized on a given population are used also to assess the same abilities in different populations (Bertone et al., 2011). Some of them may apparently have something in common, but it just a surface similarity, as their underlying causes are different. This is what makes the difference in test designing, in the assessed abilities, and the procedures to use. Similar cases are explicative of a larger and more complex situation, due to the lack, in Italian, of specific tests assessing specific abilities of a given population.

Methodological implications

It follows that every deficit or disorder must strictly be treated according to its characteristics, causes, origins and consequences. The strict connection between linguistic research and clinical practice implies that the former provides the theoretical description of the disorder, so that the latter can design and create best assessment instruments that in turn will give precious first-hand data to support or change the original hypotheses. This principle perfectly applies to language and learning disorders, and dyslexia as well.

1. Learning disorders and dyslexia

Learning disorders are impairments to comprehension and/or use of a spoken, written and/or other symbol system. The disorder may involve the form of language (phonology, morphology and syntax), the content of language (semantics) and/or the function of language in communication (pragmatics), in any combination (ASHA, 1993, p. 40; Cardinaletti, 2014). It can manifest with different degree, frequency and intensity of symptoms and problems. Most importantly, one should never concentrate only on what an individual cannot do, since most effective clinical interventions are based and designed upon what an individual can do.

In the present work, I will refer only to learning disorders in order to describe a group of disorders characterized by inappropriate development of specific language, speech, and educational skills. The learning disorders included are dyslexia (for reading and writing abilities), dyscalculia (for counting ability), and dysgraphia or dysorthographia (for writing ability).

Dyslexia is the most common learning disorder (Darcy et al., 2013) that makes the typical, effortless learning process particularly difficult for some individuals. This difficulty in learning in a typical manner is often mistaken a general difficulty in learning, when it does not exclude the ability to learn in a different manner, as people who suffer from it may have some degree of symptoms (National Institutes of Health, 2015c). The definition of dyslexia officially adopted by the International Dyslexia Association since 2002¹ is the following:

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.

¹ <<http://eida.org/definition-of-dyslexia/>>, October 2015.

In other words, we can use the term dyslexia, or developmental dyslexia, to refer to a language disorder that causes difficulty in learning to read and spell words (Berninger, 2008). Children diagnosed with dyslexia show difficulties in mastering the irregularities as well as the regularities of an alphabetic orthography, but they have normal intelligence and cognitive levels, come from an average sociocultural background, and attend traditional classes regularly (Lieberman and Shankweiler, 1979; Aglioti and Fabbro, 2006). It shall be considered a cognitive disorder and not a problem due to intelligence, external causes, sensory deficits or lack of education because the emotional problems that often arise are its consequence, and not its cause.

1.1 Different types of dyslexia?

In recent years, there has been significant debate on the categorization of dyslexia, that is thought to have at least two origins, according to the criteria or the studies taken into consideration (for a systematic review, please see Miles, 1983).

Friedmann and Lukov (2008) adopt the dual-route model for reading (Marshall and Newcombe, 1973; and others) and propose a distinction between *developmental dyslexia*, already present before reading acquisition, and *acquired dyslexia*, or *alexia*, resulting from brain damage. This last one is called *surface dyslexia* and individuals who suffer from it read by operating a conversion from graphemes to phonemes – and not the other way round. In addition, they propose the existence of *at least* three different types of surface dyslexia, each one resulting from a different impairment in the language processes, and sharing nonetheless certain characteristics.

Input surface dyslexia would be caused by a deficit to the orthographic input lexicon (B in figure 1), which will produce lower performances in lexical decision and comprehension tasks.

Orthographic lexicon output surface dyslexia would be a consequence of a deficit to both the pathways to the semantic system and to the phonological output

lexicon (respectively, 2 and 3 in figure 1), while the orthographic input lexicon is intact. These would allow lexical decision tasks, but not the comprehension of homophones, which is difficult or impossible.

Finally, *interlexical surface dyslexia* is caused by a deficit to the pathway (3 in figure 1) from the orthographic input lexicon to the phonological output lexicon, and allows normal execution of lexical decision and comprehension tasks.

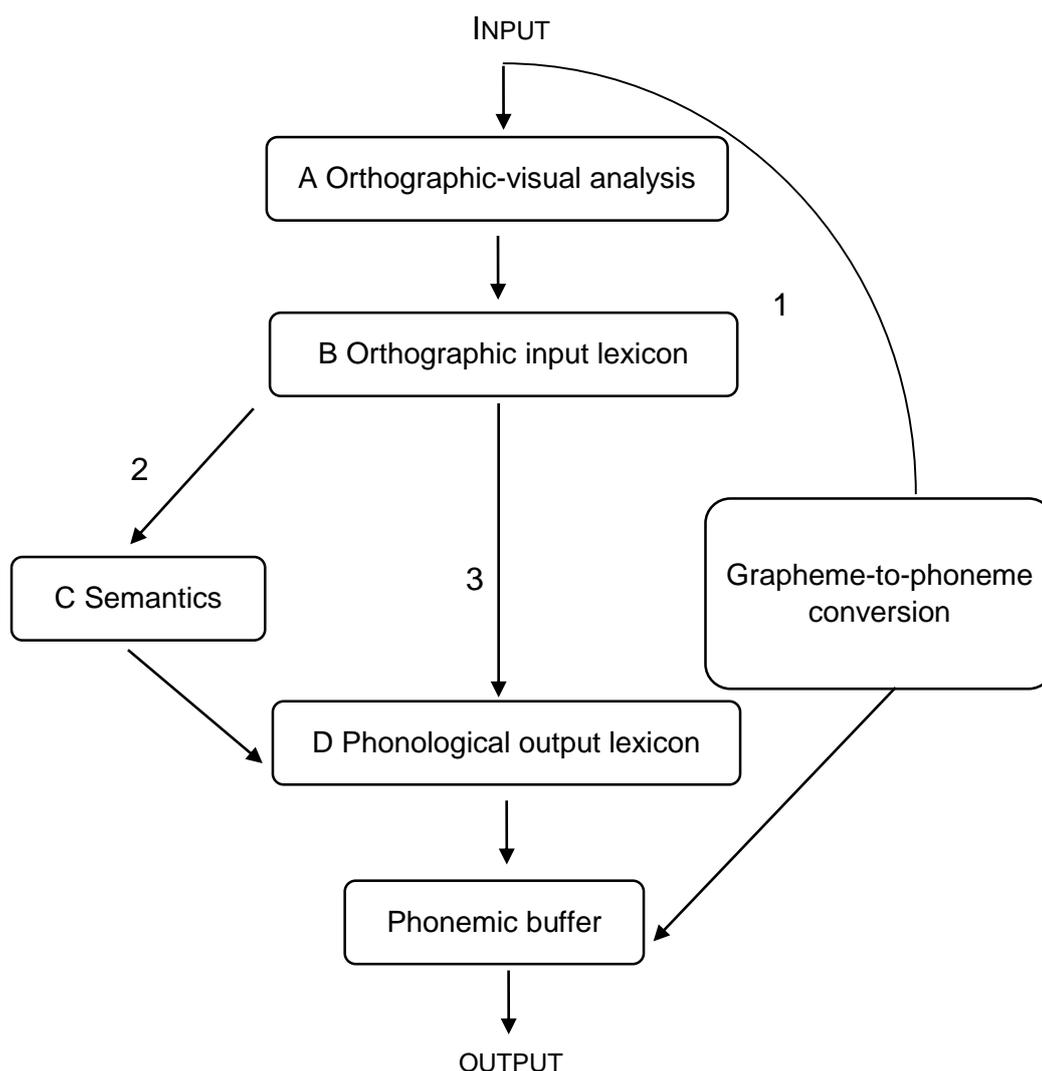


Figure 1. The dual-route reading model proposed by Friedmann and Lukov (2008).

Zoccolotti and Friedmann (2010) first distinguish between developmental dyslexia and acquired dyslexia, and observe that for the former, «17 types [...] have been identified and reported» (p. 1211). The study mainly focuses on two

types of acquired dyslexia – developmental attentional dyslexia and reading-without-meaning dyslexia, or hyperlexia. On the one side, in individuals affected by attentional dyslexia, letters migrate between neighbouring words but are correctly identified and maintain their correct relative position within the word. On the other side, reading-without-meaning dyslexic individuals perform well on oral reading of words as well as non-words, but are impaired in word comprehension, that is they do read well but without understanding what they read. Moreover, the researchers carefully underlined the effect given by large variability (of age, sex, education, and other internal variables) among the individual that took part in the study, therefore an analysis of the individual performances would shed a greater light on data. Most importantly, the study affirms that many classifications are possible, according to a characteristic or another, but that dyslexia of both developmental and acquired type share similar characteristics, thus a common approach would be particularly useful in either cases.

Eliot and Gibbs (2008) show a different attitude. In particular, they argue that proposing disorder categories, like *dyslexia* and *poor reader* or *reading disabled*, is scientifically unsupported, arbitrary, and thus potentially discriminatory. On the one hand, they acknowledge reading disability as a valid scientific subjects as well as the need for a better understanding of the relationship between visual symbols and spoken language. On the other hand, they conclude that current knowledge on dyslexia is insufficient to fulfil the previously mentioned goals, and thus dyslexia is often mistaken as a reading difficulties subset. The importance of a deep and appropriate understanding of the disorder is therefore evident, which leads to a clear and precise diagnosis that lies the basis for the most effective and long lasting treatment intervention.

This last suggestion is of particular interest since it would be of no use in the present work to distinguish between different types of dyslexia. Thus, I will only refer to developmental dyslexia or, more simply, dyslexia.

1.2 Origin and causes

In 1881, Oswald Berkhan first defined the disorder as *word blindness*, but the term *dyslexia* was coined by Rudolf Berlin who in 1887 described the case of a young boy who had a severe impairment in learning how to read and write, despite showing typical intelligence and physical abilities in all other respects. In 1896, W. Pringle Morgan published *Congenital Word Blindness*, a description of a reading-specific learning disorder in a report to the British Medical Journal.

Since then, generations of researchers have been investigating what dyslexia is and trying to identify the causes. As Vellutino (1977, p.63) reports, «dyslexia is an intrinsic developmental anomaly, the etiology of which is qualitatively different from reading difficulties arising because of extrinsic or environmental factors».

However, the misconception of dyslexia as *word blindness* lasted for long, and the focus on clinical research was more on the reading than on the spelling problems (Berninger et al. 2008). To date, dyslexia has been investigated in its biological, genetic, and neurological components.

1.2.1 Biological factors

Dyslexia is a genetically based disorder with a strong familiar trait. In most of the cases, it is present in another member of the family (Lyon et al., 2003; Tressoldi and Cornoldi, 2007; Berninger et al., 2008; National Institutes of Health, 2015a). Further evidence provided by Shaywitz and Shaywitz (2001) indicates that dyslexia affects boys and girls in equal measure; that dyslexia is diagnosed more frequently in boys appears to be the result of sampling bias in school-identified sample populations.

Most theories equate dyslexia disorder with impaired reading comprehension, and so attempt to only explain the latter. However, other studies (Irannejad and Savage, 2012; Stoodley and Stein, 2012; Ramus et al., 2003) suggested that a biological dysfunction alone may not be a primary cause of dyslexia and that disarticulation and phonological deficits appear unrelated.

Dyslexia has been commonly associated with working memory deficits (Conrad, 1964; Liberman et al., 1972). Experiments (Beneventi et al., 2010) investigated the differences in known neurological abnormalities in dyslexic patients and their

behavioural consequences, thus providing evidence that reading impairment observed in dyslexic subjects can be associated with general deficits in working memory. They found that patients with dyslexia demonstrate categorically different neural patterns from normal individuals.

Many studies provided evidence in support of a working memory model of reading disability (Catts, 2003; Catts et al., 2006; Berninger et al., 2008). All the experimental evidence (collected in the form of genetics, neural imaging comparisons, categorical differences across forms of dyslexia (different working memory deficits), and developmental linguistics) provided general validity to the proposal of dyslexia as a possible working memory deficit. Indeed, working memory plays a role in facilitating reading behaviour, and the lack of such components would result in language impairment. As the ability to retain the linguistic information draws on short-term memory, an impairment to it might explain such poor results in simple verbal tasks. However, poor readers seem to have memory difficulties only with specific conditions, that is when the material to hold in memory are concrete words and nameable objects (Katz et al., 1981; Liberman et al., 1982).

Furthermore, Perfetti and Lesgold (1979) studied the relationship of poor sentence comprehension in children with reading disability in terms of difficulty in setting up and retaining phonological structures (working memory). They found that poor decoding skills, combined with working memory limitations, produce a severely impaired comprehension. It implies that the observed neural manifestation of developmental dyslexia is task-specific, that is functional rather than structural, and that problems are caused by material, specific conditions, and not by the mnemonic component *per se*.

1.2.2 Genetic factors

Early studies (for a review, see Pennington and Gilger, 1996) considered whether dyslexia was a condition with specific genetic and/or environmental causes which produced deviant reading skills.

Genetic research into dyslexia was started in 1980s by Galaburda's team (Galaburda and Kemper, 1979; Galaburda et al., 1985). Their examinations of

post-autopsy brains found anatomical differences in the language centers of dyslexic brains, namely microscopic cortical malformations (ectopias) and more rarely vascular micro-malformations which, in some instances, appeared as a microgyrus. These studies and others (Cohen et al., 1989) suggested abnormal cortical development which presumably occurred before or during the sixth month of foetal brain development.

Once the familiar condition was recognized, linkage analysis and genetic association have been run (Grigorenko et al., 1997) in order to identify whether a single gene would be implicated in dyslexia. Consequently, several genes have been found correlated to dyslexia, including DCDC2 (Shastry, 2007; Meng et al., 2005) and KIAA0319 (Shastry, 2007; Paracchini et al., 2008) on chromosome 6 (Bishop, 2009; Grigorenko et al., 2000), DYX1C1 on chromosome 15 (Shastry, 2007; Bishop, 2009), ROBO1 (Hannula-Jouppi, 2005), DYX3 (Fagerheim et al., 1999), and CMIP (Scerri et al., 2011). However, as suggested by Butcher et al. (2008) and Meaburn et al. (2008), these genes account for a small proportion of variance in reading disability, often, less than 0.5%, beside the difficult replicability. Therefore, no single gene is definitively implicated in dyslexia. Particularly, Schumacher et al. (2009) reported that, to date, no specific cognitive process is openly influenced by the previously mentioned genes.

1.2.3 Neurological factors

Dyslexia is defined as the difficulty in an individual's ability to read in spite of adequate intelligence and normal opportunities. Whereas such a definition is particularly convenient to clinicians, it does not help scientists and researchers in their studies on development of new interventions that would allow dyslexics to learn as normal individuals. Current neurological research has provided clear evidence of biophysical and structural anomalies in dyslexic individuals. Recently, most advanced neuroinvestigation techniques produced significant results thus suggesting the disorder has neurological causes.

Over the past decade, modern neuroimaging techniques, such as fMRI and PET, have produced clear evidence of structural differences in the brains of children

with reading difficulties. As Cao et al. (2006) found, people with dyslexia present a deficit in some parts of the left hemisphere of the brain, which is involved in reading and includes the inferior frontal gyrus, inferior parietal lobule, and middle and ventral temporal cortex. One could infer that there is a correlation between both functional and structural differences in the brains of children with reading difficulties (for more detailed information, see Whitaker, 2010).

fMRI scanning was employed in Aylward et al. (2003) that compared normal readers and dyslexic readers performances in two tasks. Dyslexic children received comprehensive reading instruction only for a second task, which significantly improved their reading scores and increased brain activation. This suggests that instructional treatment in dyslexics does not create novel pathways different from normal subjects, but that re-activates and amplifies already existent neural circuits. Observed brain changes are due to specific language processes, very similar to those of normal readers. Also Shaywitz (2003) used fMRI and found that good readers show a consistent pattern of strong activation in the back of the brain with weaker activation in the front of the brain during reading tasks. Conversely, dyslexics show the opposite brain activation pattern in reading tasks, thus the frontal part of the brain becomes overactive with weaker activation in the back, “as if these struggling readers are using the systems in the front of the brain to try to compensate for the disruption in the back of the brain”.

Recently, the Health Science Center at the University of Texas (Breier et al., 2003) used behavioural techniques to isolated speech-processing sites from uninvolved ones associated with other facets of language processing, namely memory and semantics. Their results indicated the presence of a potential central marker of reading impairment that renders it difficult for dyslexic individuals to process words whilst reading. By comparing these results to prior evidence, it seems that young dyslexic subjects demonstrated a lesser involvement of auditory association centres located in the left temporal hemisphere than their control counterparts.

Hoeft et al. (2010)'s longitudinal study aimed at matching the different neural states of dyslexic individual to varying future gains in reading ability. Thanks to sophisticated fMRI and diffusion tensor imaging techniques, they would predict relationships between the activation right pre-frontal brain mechanisms and patients' progress in reading skills 2.5 years after testing, with more than 90% accuracy.

A better neurological understanding of dyslexia would provide a more accurate, distinct definition of the disorder and thereby facilitate more effective treatment procedures.

1.3 Characteristics

The most important conclusions (cf. Gilger, 2008) we can make, based on previous research, are:

- Dyslexia, like all reading disorders, is cognitively complex,
- No single cognitive or neurological model seems to explain all the data,
- There are significant qualitative and quantitative individual differences in how the disorder is manifest behaviourally and what profile of cognitive abilities may underlie a reading problem,
- The factors that indicate a high probability for dyslexia disorder in some individuals are misleading since they are not necessarily distinct from those influencing normal variation in reading skill, so dyslexia does not appear to be a 'disease' in the traditional medical sense,
- A common biological origin may be the reason why many reading disorders share some traits,
- The way brains of dyslexic individuals operate cannot be explained solely with some common functional brain patterns because of large variability and non-specificity,
- Similarly, some common patterns and atypical brain structures are found only in dyslexic brains, although with significant variability and non-focal differences in morphology,

- No single gene seems to be the underlying cause for dyslexia, and the exact number of genes involved is still to be determined.

Despite the large number of research and work done on the disorder, our present understanding of it is more complicated than it is commonly thought. However, some definitions that may well describe it are the following:

- Dyslexia is primarily a language-based disorder involving phonological awareness and processing,
- It has a neurological origin, specifically in the left inferior frontal, inferior temporal-occipital, and temporal-parietal lobes,
- It also has a neurodevelopmental origin entailing, for example, disorganized neural pathways, atypical cortical cell connection, gross and fine structural formation which differ from typical individuals,
- It also has a genetic origin, with specific genes identified after moderate heritability, repeated linkages to specific genes or chromosomal sites.

1.3.1 Oral and written language

Primarily, dyslexics have difficulty learning reading and writing – despite knowing the writing system – which in turn affects overall communicative abilities. However, not every poor reader is dyslexic. *Dyslexic* is who cannot decode properly, and should not be confused with simple *poor reader and speller*, who has adequate decoding skills but poor comprehension skills (cf. Vellutino, 1977, p. 67; Cacciari, 2001, p. 283).

Their poor auditory discrimination and phonological awareness (Phillips et al., 2013) prevent them from distinguishing sounds in words, identifying or finding rhyming words, or counting syllables in words and, in turn, make them produce highly phoneticized spelling. Moreover, they have naming problems, difficulties with word retrieval and words combination, and associating single words with their correct meaning (Berninger et al., 2008).

Dyslexics also have trouble with time keeping and concept of time, and organization skills, thus following teachers speaking or classroom procedures is particularly complicated for them (Heath, 1982; Snow 1983; National Institutes of

Health, 2015a, 2015b; van Kleeck, 2015). Importantly, this means that children with dyslexia who are undiagnosed or untreated, are at high risk for academic underachievement, non-completion of high school or college, social-emotional problems associated with chronic school failure, and underemployment as adults (Liberman and Shankweiler, 1979).

1.3.2 Graphomotor skills

Because of literacy problems, comorbidity with dysgraphia (which depends on orthographic coding) is very common, as well as the co-occurrence of dyscalculia (Handler et al., 2011). Dyslexics may have difficulty with handwriting that involves slower than average writing speed, poor handwriting characterised by irregularly formed letters, or inability to write straight on a blank paper with no guideline.

Nicolson and Fawcett (1999, 2007) reported gross motor difficulties in dyslexia, including motor skills disorders, which confirms common trouble with directions (left/right, before/after).

Dyslexia and Attention Deficit Hyperactivity Disorders are often reported to co-occur (August and Garfinkel, 1990; Semrud-Clikeman et al., 1992; Willcutt and Pennington, 2000), but recent studies reached totally opposite conclusions. Handler et al. (2011) found that about 15% of people with dyslexia also have ADHD, and 35% of those with ADHD have dyslexia, whereas Lukov et al. (2015) did not find a significant connection between dyslexia and attention deficit.

1.3.3 Mathematical skills

Although dyslexia and dyscalculia may co-occur (Peterson and Pennington, 2012), they are learning disorders with different and separate cognitive profiles. According to Landerl et al. (2009), dyslexia and dyscalculia have separable cognitive profiles, namely a phonological deficit in the case of dyslexia and a deficient number module in the case of dyscalculia. Consequently, individuals with dyslexia can be gifted in mathematics while having poor reading skills. The problems they might have are with word processing, such as descriptive mathematics, engineering or physics problems that rely on written text rather than numbers or formulas.

1.4 Theories

Theories are constantly evolving and most recent proposals tend to find a compromise between one or more theories in order to understand the nature of dyslexia. However, theories should not be viewed as competing, but as attempting to explain the underlying causes of a similar set of symptoms from a variety of research perspectives and background (for a review, cf. Ramus et al., 2003, and Nicolson et al., 2007).

1.4.1 The phonological theory

In 1925 Samuel T. Orton, a neurologist specialized in stroke victims, met a girl who had lost the ability to read, a symptom similar to those of stroke victims. Orton began studying reading difficulties and stated the syndrome that prevented the girl from reading well was not related to brain damage. His *strephosymbolia* theory (meaning “twisted signs”) explained that individuals with dyslexia had difficulty associating the visual forms of words with their spoken forms. Accordingly, reading deficits in dyslexia would not seem to stem from strictly visual deficits, differently from what was previously proposed by Hinshelwood. Particularly, he believed the condition was caused by the failure to establish hemispheric dominance in the brain, since the children he worked with were disproportionately left- or mixed-handed – although this finding has been difficult to replicate (for a more in-depth analysis, please see Geschwind (1982). Hellen Keller and Grace Fernald’s kinaesthetic work had a great influence on Orton, who later developed with psychologist and educator Anna Gillingham a multisensory educational intervention, in order to teach reading using both right and left brain functions.

In the past two decades, this phonological deficit hypothesis has been the dominant explanation, but recently (Henning and Tønnessen, 2007) the phonological hypothesis has been criticized as it fails to account for symptoms to phonetic decoding difficulties, such as problems with short-term memory, visual processing issues, or difficulties with balance and small motor coordination. However, a phonological proposal explains not only a reading impairment when

using an alphabetic writing system, which requires learning the grapheme/phoneme correspondence, but also the relationship between the graphic letter symbols and speech sounds which they represent (Ramus et al., 2003).

1.4.2. The rapid auditory processing theory

The rapid auditory processing theory (Ramus et al., 2003) proposes that the primary deficit lies in the perception of short or rapidly varying sounds. Immediate support for this theory arises from evidence that people with dyslexia show poor performance on a number of auditory tasks, including frequency discrimination and temporal order judgment.

1.4.3 The visual theory

Medical articles published by James Hinselwood during the 1890s and early 1900s described similar cases of congenital word blindness “occurring in children with otherwise normal and undamaged brains characterised by a difficulty in learning to read”. In 1917, he further stated that this primary disability would be found in visual memory for words and letters whose symptoms were, among others, letter reversals, spelling and reading difficulties, and variously impaired comprehension.

Later studies (Launay et al., 1949) investigated the concept of dyslexia as a visual deficit affecting letter-sound matching, with tasks that required reading in both directions. Adult subjects completed the reading task more easily and faster from left to right, whereas dyslexic children performed with equal speed in both directions, and some better from right to left than from left to right. This did not happen with increased letter spacing, since reading would change into spelling. This appears to be connected not only to dynamics of sight, but also to mirror-read ability. Further studies tried to find a conflict between spontaneous orientation of the eye scanning action (e.g. from right to left) and training aimed at the acquisition of an opposite direction (from left to right). Results of mirror-reading tasks conducted for a five-month time showed that that words were perceived not globally but as separate letters and syllables. They also

demonstrated total or partial inversions that sometimes affected word order in a sentence. Curiously, these inversions appeared to be not just as horizontal but also as vertical.

Several studies (Stein and Walsh, 1997; Wright et al., 2000) propose a deficit located in some pathway involved in the seeing process, particularly those specialized in the analysis of the visual movement and of the visuospatial relationships of objects. In addition, a pathway for the rapid reception, discrimination and transmission of auditory signals is dedicated to the positional and movement analysis of the auditory stimuli. If one or more of these pathways appears to be inefficient or defecting, then proper and accurate discrimination of written signs, in order to match them to speech or environmental sounds, is particularly complicated.

1.4.4. The cerebellar theory

The cerebellar theory based largely on the association of dyslexia with a lack of balance, coordination, and time estimation as well as the cerebellum's suggested role in modulating sensory, memory, concentration, cognitive, communication and emotional skills.

In addition to reading and writing problems, individuals with dyslexia can also exhibit earlier delays in motor milestones associated with the cerebellum, such as crawling, walking, talking, and coordination.

Ramus et al. (2003) and Stoodley and Stein (2009) propose that, as the cerebellum also contributes to the automatization of learned behaviours, such as learning the grapheme-phoneme relationships when reading texts, its malfunctioning results in the phonological deficit that produces the articulation problems typical of dyslexia.

1.4.5 The magnocellular theory

The magnocellular theory proposes a magnocellular dysfunction which is not only restricted to the visual pathways but also includes auditory and tactile modalities (Ramus et al., 2003; Ray et al., 2005). However, if some contrast sensitivity studies (Skottum, 2000) seem critical, when not conflicting, some studies of visual

evoked potentials (Schulte-Körne and Bruder, 2010) provide mixed evidence and results. Several variables such as age, differences in experimental design, effect size on samples, and also the presence, absence, or uncertainty of ADHD might explain these contradictory findings.

A multisensory version of the theory comprising both visual and auditory abilities (for an accurate review, see Farmer and Klein, 1995) suggests that language impaired children (suffering from dyslexia and specific language impairment) have a specific deficit to the elaboration of both visual and auditory modalities. The temporal elaboration deficit hypothesis states that phonological disorders come directly from visual and auditory dysfunctions that, in turn, cause dyslexia disorder.

In some ways, the magnocellular theory can be seen as an attempt to unify the cerebellar theory (Ramus et al., 2003; Stoodley and Stein, 2009), the phonological theory (Ramus et al., 2003), the visual and rapid auditory processing theories (Ramus et al., 2003; Ray et al., 2005).

1.4.6 The perceptual visual-noise exclusion theory

The concept of a perceptual noise exclusion deficit, which is impaired filtering of behaviourally irrelevant visual information in dyslexia or visual-noise, is an emerging hypothesis (Sperling et al., 2006; Roach and Hogben, 2007) Subjects with dyslexia experience difficulty in performing visual tasks (such as motion detection in the presence of perceptual distractions) but do not show the same impairment when the distracting factors are removed in an experimental setting. Other studies (Sperling et al., 2005) compared their findings on visual discrimination tasks with other research on auditory discrimination tasks, and concluded that dyslexic symptoms arise because of an impaired ability to filter out both visual and auditory distractions, and to categorize information, in order to distinguish the important sensory data from the irrelevant.

Of all the theories seen before, it seems that the magnocellular deficit theory, the cerebellar theory, and the perceptual visual-noise exclusion theory can be seen as speculating on dyslexia as a sensory mechanism, thus non-linguistic, deficit.

1.4.7 The speed deficit and double deficit theories

These two theories (Denckla and Rudel, 1976) are often mentioned and proposed together. In fact, they support the idea that the speed an individual can have in rapid automatized naming of familiar objects or letters is a strong predictor of dyslexia. Crucially, deficit in naming speed is hypothesized to be separate from phonological processing deficit. Distinguishing between these deficits has important implications for instructional intervention (Birsh, 2005).

A last important remark might be that developmental dyslexia is, together with all other language disorders, not only a language-specific problem, in contrast to acquired disorders and deficits, e.g. aphasia and strokes. Indeed, as seen before, reading and writing difficulties may influence not only formal, academic learning, but also learning possibilities in other non-formal contexts.

2. Different approaches, different outcomes

In the course of time, biology, genetics and neurology studies tried to find exact and discrete source for the disorder, and nonetheless provided key information. In addition, theories and approaches have generally been proposed together in order to explain, diagnose and treat dyslexia disorder. However, for the sake of the present work, I am going to present and discuss the two main perspectives adopted to date for dyslexia, both in English and Italian (for review, see Facchetti and Cornoldi, 2007, pp. 58-69).

2.1. The visual approach

The visual theory can be found in several studies (Stein and Walsh, 1997; Wright et al., 2000; cf. section 1.4.3) that propose an elementary deficit to the magnocellular system. It represents a traditional perspective of dyslexia, as being the result of a visual impairment creating problems when processing information from letters and words from a written text. This includes visual processing problems such as binocular, poor vergence, and visual crowding. Importantly, as Ramus et al. (2003) underlines, the visual theory does not deny the possibility of alternative causes of dyslexia.

Consequently, an approach developed in this vein considers dyslexia as a consequence of the deficits of the sensory, non-linguistic mechanisms. These deficits would alter early elaboration processes of visual and auditory information. Thus, characteristic features and most common errors of dyslexics would arise from confusion when decoding the written text, the print. Moreover, these may be absent or present, and to various degrees, ranging in age, sex and sociocultural condition.

2.1.1 Approach to dyslexia in Italian

The Associazione Italiana Dislessia gives some indications for an early and later identification of dyslexia², whereas Dettori (2015) provides a list of typical learning errors and general behaviours of dyslexics in the same vein:

- Reading difficulties:

- poor discrimination of letters that are similar graphically, e.g. “a-e”, “p-q”, “m-n” and “d-b”,
- poor discrimination of letters that sound similar, e.g. “d-t”, “p-b”, and “f-v”,
- letters inversion, e.g. “catrello” instead of “cartello”,
- words and lines are skipped,
- confusion even with simple words,
- particular difficulty in reading long words.

- Writing difficulties:

- confusion of sounds that are visually similar for shape (“m-n”, “b-d”) or sound (“p-b”, “v-f”),
- group reductions, e.g. **pota* instead of *porta*,
- illicit fusions or separations, e.g. **lape* instead of *l’ape*,
- letters, syllables or parts of word omission, e.g. **lireria* instead of *libreria*,
- orthography errors,
- unclear handwriting, especially in cursive,
- general copying errors,
- disharmonic use of sheet space.

- Counting difficulties:

- writing numbers,
- confusion of mathematical symbols,
- difficulties rapid calculating and learning multiplication tables,
- confusion of the procedures and in the use of sheet space, e.g. putting numbers in column,

² < <http://aiditalia.org/it/la-dislessia/come-si-riconosce-la-dislessia> >, November 2015.

- problem solving, despite good logical comprehension.
- Other difficulties (Stella and Grandi, 2011):
 - distinguishing left and right sides,
 - memorizing and recalling of sequences, e.g. weekdays, months of the year, alphabet, use of dictionaries,
 - saying the hour with analogical clocks,
 - short-term memory task,
 - memorizing specific terminology, dates, historical periods, geographical elements,
 - orienting themselves in time and space,
 - fine motor tasks, e.g. lacing shoes.

2.2 The phonological approach

A phonological approach for dyslexia would come directly from phonological proposals (Vellutino, 1979; Snowling, 2000; Ramus, 2003; Vellutino et al., 2004) that describe dyslexic individuals as having a specific sound manipulation impairment. This would affect in turn their auditory memory, word recall, and sound association skills when processing speech (for review, see Rack et al., 1992; van IJzendoorn and Bus, 1994). It is a prevalent cognitive-level explanation for the cause of reading difficulties in dyslexia and stems from evidence of poor performances on tests which measure ability of decoding nonsense words using conventional phonetic rules. Consequently, there is a high correlation between difficulties in sounds-letters matching and language and reading delays, or failure (Vellutino et al., 2004).

2.2.1 Approach to dyslexia in English

As reading requires phonological decoding of strings made of arbitrary visual symbols, dyslexia may be caused by several factors – both phono auditory and visual perceptive. Thus, dyslexia appears to be a specific disorder due to the dysfunction of one, or more, linguistic modules in charge of the phonological elaboration. In fact, reading ability enhances phonological representations,

which, in turn, improve reading ability. The same seems to be true for the orthographic representations and writing ability. Dyslexics' poor phonological awareness would prevent them to be aware and access to the individual sounds in words (Mattingly, 1972). Not only written but also oral and auditory tasks are difficult for them, since the ability to analyse spoken words is required. Obviously, the main consequence of this is a disadvantage in learning to read.

Interestingly, several researchers (Bourassa and Treiman, 2001; Treiman, 1997) tried to divide misspelling errors into *phonetic* and *non-phonetic* categories but, unfortunately, this classification of spelling did not capture some important distinctions among errors. Non-phonetic errors, e.g. **fod* for *past*, may not be explained phonologically, since there is simply a lack of knowledge about sound-to-spelling correspondences. However, other non-phonetic errors, e.g. **cene* for *clean*, and **sak* for *sank*, have a phonological basis. If dyslexics make many such errors, one could claim that they do not apply phonological principles to spelling. However, as previous examples showed, such errors are very common for both dyslexic and normal beginners.

Treiman and Bourassa (2000a) and (2003) compared dyslexic children and typically developing children and found an important lexicality effect produced by the different skills of typical beginners. Particularly, both groups were more advantaged by written spellings than oral spellings, namely when they said it aloud. This advantage was larger for non-words than for words, thus suggesting that a written record is especially helpful when phonological skills are stressed, as in computing spellings for non-words.

Although the spellings of older children with dyslexia differed but subtly from those of younger normal children, a crucial finding was that the processes and strategies used by both groups were quite similar. Children suffering from dyslexia and normal learners show the same general patterns of performance and make similar kinds of errors. This results are fundamental in supporting the idea that the misspellings of children with dyslexia are not casual, but linguistically motivated and, most importantly, not dramatically different from those of typical children.

2.3 Some consideration

Dyslexia is a complex, lifelong disorder involving difficulty in learning to read or interpret words, letters and other symbols that, however, does not affect general intelligence. As mentioned before, what is most impaired in individuals who suffer from dyslexia is the ability to learn reading and writing, since problems with oral language and speech are minor, although present. As Stanovich (1986) proposes that, since some structures that have been found problematic (i.e. relative and passive sentences) are typical of the written language, linguistic difficulties in dyslexics may be due to their little, or lacking, experience with it.

The human brain does have language centres for spoken and gestural communication but not for written language because it is a cultural artefact, and a very complex one, requiring brain regions designed to recognize and interpret written symbols as representations of language in rapid synchronization. Is it a case that written language is particularly difficult in dyslexic individuals? Apparently, it is not. For the difficulty in acquiring and understanding written language, Caplan (1987) suggests the intrinsic complexity of the system and the lack of genetic predisposition.

Nonetheless, most of the current research on dyslexia focuses on alphabetic orthography (Paulesu et al., 2001; Karanth and Jing, 2002; Seymour et al., 2003; Ellis et al., 2004; Wolf, 2007), suggesting that orthography, which represents the correspondence between the language phonemes (sound units) and its graphemes (characters, symbols, letters), plays a significant role in the type and frequency of dyslexia's manifestations.

Consequently, languages can be divided either on the basis of their writing systems, or on the basis of their orthographies. Worldwide, people not only speak different language but also write them with different writing systems.



Figure 2. Present-day world alphabets and writing systems. Image retrieved from < [https://en.wikipedia.org/wiki/Writing_system#/media/File:World_alphabets %26_writing_system s.svg](https://en.wikipedia.org/wiki/Writing_system#/media/File:World_alphabets_%26_writing_system_s.svg)>, January 2016.

Writing systems are developed to represent languages, so generally orthographies are meant to provide rules for the spelling of words in languages. According to the principle alphabets are based on, these rules will generally map letters of the alphabet to the phonemes (meaningful sounds) of the spoken language. Significantly different from alphabetic writing systems which use graphemes to represent phonemes, logographic writing systems (such as Chinese and Japanese characters) use logograms, that is a representation based on meaning (morphemes) rather than phonemes. Chinese and Japanese Kanji use sets of one or more characters to represent morphemes. In kanji, there are usually two ways to read a symbol, one that is similar to the original Chinese and one that is for the Japanese word.

In a perfectly phonemic orthography, there would be a consistent one-to-one correspondence between the letters and the phonemes, so that a writer could predict the spelling of a word given its pronunciation, and a speaker would always know the pronunciation of a word given its spelling, and vice versa. However, this ideal is not usually achieved in practice, so it is possible to make a further

distinction based on the graphemes-phonemes correspondence: *shallow, or transparent orthographies* have symbols that (more) uniquely map to sounds, or at least with limited or clearly signified variation – as with accent marks or other distinguishing features, whereas *deep, or dense, orthographies* do not reliably map to specific phonemes/sound units, and so are ambiguous in terms of the sounds that they represent. Particularly, Seymour et al. (2003, p. 146) proposes the following division (with respect to the twelve European languages analysed):

		Orthographic depth				
		Shallow			Deep	
Syllabic structure	Simple	Finnish	Greek Italian Spanish	Portuguese	French	
	Complex		German Norwegian Icelandic	Dutch Swedish	Danish	English

Table 1. Orthographic depth differences of twelve European languages, proposed by Seymour et al. (2003).

Some psycholinguistic studies (Landerl et al., 1997) point at that the complexity of a language's orthography as the major cause for dyslexia's severity and occurrence, thus suggesting that a more regular system would be associated with a reduced number of cases of dyslexia and/or with less severe symptoms. What is implied is that the complexity of a language's orthography is directly related to the difficulty of learning to read in that language, and that orthographic complexity contributes to how dyslexia manifests in readers of different languages. Thus, learning e.g. Italian or Spanish would be easier for both challenged and non-challenged learners than learning e.g. English or German.

Something that should not be forgotten is that there are a number of different types of writing systems, and they do not necessarily depend on the same

neurological skill sets (Siok et al., 2009). As a result, certain dyslexic deficits may be more evident in some orthographies than in others.

Importantly, the purpose of cross-linguistic studies is to either confirm or dismiss a similar proposal. Aro and Wimmer (2003) report differences in developmental reading skills across several alphabetic orthographies, confirming large difficulty for English beginners compared to French, German, Dutch, Spanish, Swedish and Finnish. However, as Bortolini (2010) remarks, reading disabled learners make errors that are typical and specific for a given language. Leonard and Bortolini (1998) suggests that cross-linguistic differences among dyslexic learners may depend on the phonetic and prosodic characteristics that every language has, and that the number of errors, substitutions, or deletions, is directly influenced by a variously rich morphology.

Very interestingly, Ashum and Gulgoona (2006) compared performances of dyslexic children in both Hindi and English. The significant correlation found between Hindi and English word reading indicates that children were poor readers in both languages. This finding supports the linguistic interdependence hypothesis, which holds that there is a significant relationship between the skills in the two languages learned by children. This also implies that children who have learning problems in their second language will also manifest similar difficulties in their first language. Interestingly, the errors analysis found more phonological-based errors than orthographic-based ones, thus suggesting that children do not answer casually by picking out any letter, or group of letters, but instead trying to read words sequentially, so letter-by-letter decoding in left-to-right direction. This indicates an incomplete elaboration of graphemes that, in most cases, produced a guessed word, e.g. *hug* in place of *huge*, or non-word answer, e.g. *sapil* instead of *spell*.

Wimmer et al. (2000) selected small groups of typically developing German beginners on the basis of some learning deficits (phonological awareness, naming-speed, and double deficit) and results indicate that, differently from

English, phonological awareness deficits did not affect phonological coding in word recognition but did affect orthographic spelling and foreign-word reading. Naming-speed deficits did affect reading fluency, orthographic spelling, and foreign-word reading. This suggests that, in the context of regular orthographies and a synthetic phonics teaching approach, early stages of literacy acquisition (particularly the acquisition of phonological coding) are less affected by early phonological awareness deficits than later stages that depend on the construction of orthographic memory. This would happen because English and German have both very similar phonologies and, at the same time, quite different orthographies, the authors suggest.

Abu-Rabia and Taha (2004) provides precious information on both literacy and spoken Arabic. The comparison between dyslexic and typically developing children performances highlighted similar reading and spelling errors, consistent with an immature phonological awareness. This finding indicates that Arabic readers rely on word recognition strategies that involve phonological decoding skills, visual–orthographic recognition, and high morphological mapping. However, dyslexics made more phonetic errors that involved inaccurate pronunciation of words, according to an orthographic pattern in reading texts, words and non-words, and this is because of a severe phonological deficit in applying grapheme–phoneme rules in decoding words, that leads them more to rely on visual strategies in word recognition. However, Paulesu et al. (2001) suggested that despite different orthographies, all children with dyslexia experience exactly the same reading difficulties, including reading speed deficit and slow decoding mechanisms. These findings suggest that orthographic differences do not play a significant role in individuals with dyslexia.

Shaywitz et al. (2007) propose that dyslexic beginners of logographic languages rely more heavily on visual memorization than for alphabetic systems, since grapheme memorization partially solves their phonological awareness deficits, so acquisition of logographic languages may be less difficult and demanding (Himmelstein, 2011). However, such an advantage seems to reduce when

compared to the time and effort that every logographic language learner needs to learn three different logographic systems, that do not offer phonological clues. As a result, also logographic writing systems appear to have a very irregular grapheme-phoneme correspondence (Ellis et al., 2004).

Finally, Rello et al. (2014) provides an accurate analysis of errors done by Spanish dyslexic individuals. By keeping in mind that Spanish has shallow, or transparent, orthography, the error analysis was thus conducted phonetically. Surprisingly, it found that the most frequent substitution errors had a phonetic explanation, namely that they are made when the two sounds share at least one phonetic feature (be it either the place of articulation or voicing) – particularly when the correspondence between graphemes and phonemes is not univocal, as for **reelly* instead of *really*, or **approch* instead of *approach*. In such cases, spelling mistakes are due to confusion within the same class of consonants and are phonetically motivated. A similar explanation had already been provided by Vellutino (1977). He stated that letter reversals errors are not due to visual confusion of letters graphically similar, but to several deficiencies in verbal processing, so the errors are *mislabelling errors* (p. 79) occurred when matching verbal material to printed symbol(s).

The previous analysis suggests that a particular phonological difficulty is a common cross-linguistic characteristic of dyslexia disorder, with a differently active role due to several factors, e.g. degree of the disorder, early intervention, and orthography.

2.4 A new perspective for Italian

With regard to dyslexia in Italian, a strong phonological correlation was found (Cornoldi, 1999; Sabbadini et al., 2000), especially in the work of Bortolini (1995; 1995; 1995; 2002; 2010). This would be unexpected for Italian, if we consider its orthography, more transparent and thus easier than English or French. However, this area has also been little investigated (Tressoldi et al., 2001; Facchetti et al.,

2009) and so there is little agreement on the topic (cf. Cornoldi, 1991; 1999; Dettori, 2015).

On the one side, Cornoldi declares the phonological source of both dyslexia and specific language impairments. Individuals suffering from these language disorders have significant problems with rapid automatic naming of objects, repeating new or rare words, manipulating linguistic sounds. In spite of their oral origin, these difficulties manifest openly when moving from oral language to written language, so in the early years of school. It is precisely for their nature that they obstacle oral and written language, decoding, comprehension, and overall expression abilities. Consequently, they can influence differently the areas of phonology, semantics, lexicon, and morphosyntax. More specifically, disorders more directly connected with dyslexia affect phonology, thus the ability of working with linguistic sounds.

On the other side, also Dettori claims the phonological source for dyslexia disorder, which prevents dyslexics from proper identification of words. This seems to imply that reading requires matching printed words *as a whole* with their meaning, and not decoding several graphemes into one or more phonemes. In fact, he later proposes Frith's model for reading and writing (Frith, 1983), represented below:

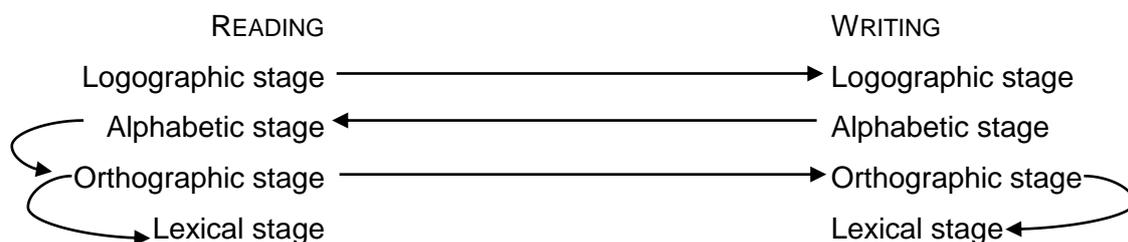


Figure 3. The reading and writing model proposed by Firth (1983).

Accordingly, reading and writing abilities are interdependent and organized in four identical stages, i.e. logographic, alphabetic, orthographic, and lexical stage. In this model, the ability that first completes a development stage will influence

the other that has not yet. Apparently, no phonological stage is present for both abilities, although some phonological, or sublexical, processes are operated, the author says. Children would make mental single grapheme-phoneme associations, and then read the whole word – a slow and tiresome process.

However, this does not seem to explain the reading of certain Italian graphemes and digraphs, like *h* or *ch*, *gh*, and *sc*. In fact, in Italian *h* does not correspond to any phoneme, while it does change the ‘soft’ *c* and *g* (respectively, [tʃ] and [dʒ]) into the correspondent ‘hard’ *c* and *g* (respectively, [k] and [g]). Digraph *sc* can have two different pronunciations, [ʃ] and [sk] (please see next chapter for further explanation). This seems in contradiction with not only the phonological origin of dyslexia but also with the general observation list compiled by Dettori (2015) (see paragraph 2.1.1). Although the initial statement of the phonological origin of dyslexia, the list seems to consider the disorder with a graphemic approach. In addition, some points do not make much sense, as for «confusion of *sounds* that are *visually similar* for *shape* [...] or *sound* [...]».

I propose that, in spite of a more consistent grapheme-phoneme correspondence, errors in Italian dyslexic beginners can be explained in a phonetic perspective.

Although Italian and English are two languages very different under many points of view, I am going to compare and analyse their phonetic systems. My purpose is to show that there are more similarities than differences, and thus that a phonological approach, similar to the one adopted for English, can lead to a more complete understanding of dyslexia disorder in Italian.

3. Phonemes and sounds, graphemes and letters

«L'italiano è una lingua parlata dai doppiatori»

(Enno Flaiano)

One of the main bases of study of dyslexia has been the writing system of a language, or its orthography (Orton, 1925; Geschwind, 1982; Ramus et al., 2003). One of the most common assumption that dyslexia is more commonly present in speakers using languages with a dense orthography, which display a non-univocal for correspondence between sounds and letters. Consequently, what is assumed is that transparent orthographies are associated with lower rates of dyslexia (Marinelli et al., 2013). However, some preliminary and general remarks are necessary³.

3.1 Human languages, phonetics, phonology, and the IPA

Languages are primarily oral systems, even though most of them have also a written counterpart. However, it should be no surprise if, in our modern societies, very first contacts with it very frequently happen through reading and writing, also depending upon needs and cultural expectations. The preponderance of the oral form over the written form is universally acknowledged, not only for quantitative data (the former used more than the second), but for some general reasons. Historically, all languages come first and always in their oral form, and then potentially in their written form – only if and when the society speaking the language reaches a sufficient cultural level (Cacciari, 2001; Aglioti and Fabbro, 2006; Denes, 2009). Individually, we all learn our mother language always first orally, and only later also written, if circumstances allow and require it. Linguistic varieties like dialects do not have a written counterpart, as this use is generally reserved for standard (official) languages (Avolio, 2009).

³ In this chapter, I will make examples for both Italian and English languages. Graphemic words are provided in italic for both languages, whereas phonetic transcriptions are provided in squared brackets and only for the language I am exemplifying, so *amico* 'friend' [a'miko]. In case of cross-linguistic comparison and reflection, phonetic transcription of the word in both languages will be provided. In case of morphologic or semantic comparison, no phonetical transcription at all will be provided. Words preceded by * do not exist, or have not been attested.

Phonology is a branch of linguistics concerned with the systematic organization of sounds in languages. Traditionally, it has focused mostly on the study of the phonemes systems in particular languages, but it may also cover linguistic analysis either at a level beneath the word (syllable, onset and rime, articulatory gestures, articulatory features, etc.) or at all language levels, where sound is considered to be structured for conveying linguistic meaning. Phonology is often distinguished from *phonetics*. Indeed, phonetics concerns the physical production, acoustic transmission and perception of the sounds of speech, whereas phonology describes the way sounds function across languages to encode meaning (Carr, 1993; Maturi, 2006). For many linguists, phonetics belongs to descriptive linguistics, and phonology to theoretical linguistics, although establishing the phonological system of a language is necessarily an application of theoretical principles to analysis of phonetic evidence.

Very commonly, we all pay more attention to the graphemic form of words instead of its oral form, although we content that the written forms always precede the sound forms. In fact, the acoustic form is made of sounds conveying meaning, the phonemes, and not of arbitrary graphical symbols, the graphemes. Which sounds are phonemes of a language is very specific and sometimes distinctive for each language. For example, /t/ is an Italian phoneme and can form words like *tavolo*, *topo*, *tappeto*, but the sound we make when whispering is not a phoneme, so it cannot be used to form words.

Every language has its own phonemic system and rules to combine them together into syllables and words. When combined together, the sounds can both influence others and be influenced by others, and, possibly, change. Similar changes follow phonological rules, again specific for every language.

The International Phonetic Alphabet (or IPA) is a phonetic notation alphabet system, based partially on the Latin, Greek and Old English alphabets, together with some invented symbols. It was first proposed in 1886 by the Association Phonétique des Professeurs d'Anglais, later Association Phonétique

Figure 4. The complete IPA chart, retrieved at <http://www.internationalphoneticassociation.org/content/ipa-chart>. Available under a Creative Commons Attribution-Sharealike 3.0 Unported License. Copyright © 2005 International Phonetic Association.

Most importantly, IPA meets the fundamental need to use the same symbols for the same language sounds worldwide. This goal could not be satisfied by the already existing alphabets of natural languages, since the same letter does not correspond to the same sound in different languages, and also within the same alphabet some inconsistencies can be observed. For example, in Italian the grapheme *c* has both a “soft” sound [tʃ], as in words like *cielo* [ˈtʃelo] ‘sky’ and *pace* [ˈpatʃe] ‘peace’, and a “hard” sound [k], as in words like *casa* [ˈkaːsa] ‘home, house’ and *pacco* [ˈpakko] ‘box’. In English, the grapheme *u* has different phonetic realisations, as in *but* [bʌt] ‘ma’ and *cute* [kjuːt] ‘carino, gentile’.

In order to provide an answer to these questions, we will take an in-depth look at both the Italian and English phoneme systems.

3.2 The Italian phoneme system

Of all the phonemes present in IPA, Italian has selected only some of them.

However, a preliminary but important observation has to be made. The following descriptions are valid for standard Italian that is the normative realisation of Italian language, which, consequently, do not apply either to the many varieties of Italian that are actually spoken in Italian regions, or to individuals’ personal varieties. More accurately, we could say that standard Italian is spoken only by some categories of professionals, such as actors and newscasters, who are specifically instructed to follow the norm totally or partially, according to their job necessities.

3.2.1 Vowels

Vowels can be classified considering three criteria that are tongue elevation (how high or low tongue is, relatively to the palate), tongue position (the position our tongue occupies inside our mouth), and lip rounding (the position of our lips). In contrast to the typical trapezoidal shape by IPA⁵, Italian vowels are traditionally

⁵< <https://www.internationalphoneticassociation.org/content/ipa-vowels> >, December 2015.

represented in a symmetrical triangle, known as vowel triangle, *triangolo vocalico* (Graffi and Scalise, 2013):

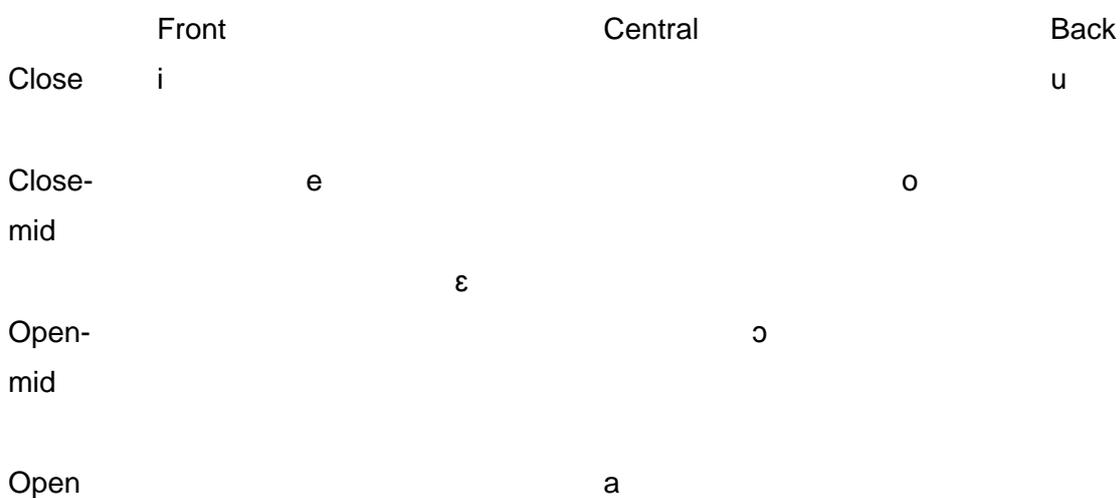


Figure 5. The Italian vowel triangle.

3.2.1.1 Vowel combinations

Two vowels one immediately after the other, within the same syllable, as in *causa* ‘cause’ and *mai* ‘never’, are called diphthongs. They always feature either *i* or *u* which, according to their position, function as semivowel or semiconsonant. Consequently, in Italian a diphthong can be:

- ascendant, if semiconsonant *i* or *u* occupy the first position as for *ia* (*bianco* ‘white’), *ie* (*pieno* ‘full’), *io* (*priorità* ‘precedence, priority’), *iu* (*piuma* ‘feather’), *ua* (*tregua* ‘truce, rest’), *ue* (*duemila* ‘two hundred’), *ui* (*lui* ‘him’), *uo* (*suono* ‘sound’),
- descendant, if semivowel *i* or *u* occupy the second position as for *ai* (*daino* ‘deer’), *ei* (*sei* ‘six’), *oi* (*poi* ‘then, later, after’), *ui* (*suino* ‘pig, pork’), *au* (*auguri* ‘wishes’), *eu* (*Europa* ‘Europe’).

Triphthongs is a three-vowel combination within the same syllable when, crucially, two of them become either semivowels or semiconsonants, so:

- semivowel + vowel + semiconsonant, as for *iei* (*miei* ‘our’), *ioi*, *uai* (*guai* ‘trouble’), *uei*, *uoi* (*buoi* ‘oxen’),
- two semiconsonants + vowel, as for *iuo* (*aiuola* ‘flowerbed’).

Hiatuses are two-vowel combinations which are pronounced distinctly as they belong to two different syllables. It can be considered as the opposite of the diphthong. Such combinations:

- never feature *i* or *u*, both semiconsonant and semivowel, as for *teologia* ‘teology’,
- can present a stressed vowel, which is always *i* or *u*, and a non-stressed vowel, which can be *a*, *e*, or *o* as for *caffèina* ‘caffeine’,
- can be found in compound words, when the distinction between prefix and base is evident, as for *biennio* ‘two-year period’.

3.2.2 Consonants

As the IPA classification requires, when two sounds are present in the same box, the one on the left is voiceless and the one on the right is voiced (Maturi 2006; cf. Graffi and Scalise 2013):

	Bilabial	Labiodental	Alveolar	Post alveolar	Palatal	Velar
Plosive	p b		t d			k g
Nasal	m	ɱ	n		ɲ	ŋ
Trill			r			
Fricative		f v	s z	ʃ		
Affricate			ts dz	tʃ dʒ		
Approximant					j	w
Lateral			l		ʎ	

Table 2. The Italian consonant system.

Some phoneme(s)-grapheme(s) inconsistencies are (Graffi and Scalise, 2013):

Phonetic symbol	Graphemes	Examples
[k]	<i>c</i>	<i>cane</i> 'dog' ['kane]
	<i>ch</i>	<i>parchi</i> 'parks' [par'ki]
	<i>k</i>	<i>kiwi</i> 'kiwi' ['kiwi]
	<i>ck</i>	<i>ticket</i> 'medical fee' ['tikɪt]
[tʃ]	<i>c</i>	<i>accendere</i> 'to light' [at'tʃɛndere]
[g]	<i>g</i>	<i>gamba</i> 'leg' ['gamba]
	<i>gh</i>	<i>ghiaccio</i> 'ice' ['gjattʃo]
[dʒ]	<i>g</i>	<i>gesso</i> 'chalk' ['dʒɛsso]
[n]	<i>gn</i>	<i>lavagna</i> 'black board' [la'vanːa]
[ʎ]	<i>gl</i>	<i>maniglia</i> 'handle, grip' [ma'niʎːa]
[ʃ]	<i>sc</i>	<i>sciare</i> 'skiing' [ʃi'are]

Table 3. Phoneme-grapheme inconsistencies of Italian.

3.2.2.1 Silent *h*

Letter *h* is the only grapheme that does not have a phonemic correspondent, that is that does not have a sound (Graffi and Scalise, 2013). Indeed, some teachers in schools call it *mutina*, literally 'little silent one'. Beside its use in words of foreign origins, now part of Italian lexicon, such as *hotel*, *hobby*, *hard disk*, *hardware*, *hip-hop*, *hippie*, it is traditionally used for the following purposes:

- the digraphs *ch* and *gh* occur before *e* and *i* and signal an occlusive sound, respectively [k] and [g]; *c* and *g* only, occurring before *e* and *i*, signal an affricate sound, respectively [tʃ] and [dʒ],
- to signal some forms of the verb auxiliary *avere* 'to have' for it comes from the Latin (*habeo*, *habes*) and is crucial to distinguish them from some other parts of the speech:

Verb <i>avere</i>	Other parts of the speech	
<i>io ho</i>	<i>o</i> 'or' conjunction	<i>oh</i> 'oh', interjection
<i>tu hai</i>	<i>ai</i> 'to N _{PL} ', preposition	<i>ahi</i> 'ouch', interjection
	<i>ahimè</i> 'oh my', interjection	
<i>egli ha</i>	<i>a</i> 'to', preposition	<i>ah</i> , interjection
<i>noi abbiamo</i>		
<i>voi avete</i>		
<i>essi hanno</i>	<i>anno</i> 'year', noun	

Table 4. Comparison between parts of speech in Italian with and without *h*.

3.2.2.2 Consonant clusters

Several combinations of consonants are possible. When the two consonants are different, they form consonant clusters (*gruppi consonantici*). Below is a table of the most frequent (Graffi and Scalise, 2013). Please note that the last two can have two different pronunciations:

Graphemes	Phonetic symbols	Examples
<i>cu, qu, cqu</i>	[kw]	<i>cuore</i> 'hearth', <i>qua/qui</i> 'here', <i>acqua</i> 'water', <i>acquisto</i> 'purchase'
<i>ccu, qqu</i>	[k:kw]	<i>taccuino</i> 'notebook', <i>soquadro</i> 'in disarray'
<i>ch</i>	[k]	<i>chiuso</i> 'closed'
<i>gh</i>	[g]	<i>ghetta</i> 'gaiter'
<i>mb</i>	[m̥b]	<i>cambio</i> 'change'
<i>mp</i>	[m̥p]	<i>tempo</i> 'time, weather'
<i>gn</i>	[n]	<i>bagno</i> 'bath(room)'
<i>gl</i>	[ʎ]	<i>tovaglia</i> 'tablecloth'
	[g]	<i>inglese</i> 'English'
<i>sc</i>	[ʃ]	<i>sciarpa</i> 'scarf'
	[sk]	<i>scatola</i> 'box'

Table 5. Consonant clusters of Italian.

3.2.2.3 Double consonants and doubling rules

When the two consonants are the same, as *t* in *gatto* ['gat:o] 'cat', they are called geminates, or doubles (*doppie*). All of the consonants can have doubles except *q* (see below) and *h*, *j*, *k*, *w*, and *x*. Consonants double only with the following prefixes:

- *a-* as for *abbraccio* 'hug',
- *e-* as for *eppure* 'yet',
- *i-* as for *irraggiungibile* 'unattainable, out of reach',
- *da-* as for *daccapo* 'from the beginning',
- *ra-* as for *raggomitolare* 'to roll something into a ball',
- *se-* as for *seppure* 'although',
- *so-* as for *soccorrere* 'to rescue',
- *su-* as for *suggerire* 'to suggest',
- *fra-* as for *frapporre* 'to place obstacles in the way',
- *contra-* as for *contravvenire* 'contravene, violate',
- *sopra-* as for *sopraffare* 'to overpower',
- *sovra-* as for *sovrapposizione* 'overlap'.

Consonant doubling does not happen:

- with *q*, except in the word *soquadro* 'in disarray',
- with the prefix *contro-* (*controbattere* 'counterattack'),
- with *b* occurring before the suffix *-bile* (*accettabile* 'acceptable')
- with *z* and *g* occurring before the ending *-ione* (*ragione* 'reason', *emozione* 'emotion').

3.2.3 Syllable stressing and syllable marking

Although Italian is generally considered not to be a stress-time language, stress is nonetheless present in different forms and, sometimes, dramatically changes the meaning. In other words, words stress in phonemic. In Italian, this linguistic phenomenon manifest as either stress, or phonic accent, which is a shorter or

longer duration of the syllable that carries the stress, or as accent mark, or graphical accent, which is the graphical representation of the stress⁶.

In the first case, stressed words are classified according to the syllable that carries the stress, so:

- oxytone words ‘parole tronche’ have stress on the last syllable, as in *liquidità* ‘liquidity’,
- paroxytone words ‘parole piane’ have the stress on the second to last syllable, as in *catèna* ‘chain’,
- proparoxytone words ‘parole sdrucciole’ have stress on the third to last syllable, as in *invisibile* ‘invisible’,
- ‘parole bisdruciole’ have stress on the fourth to last syllable, as in *ricòrdatelo* ‘(you) remember it’,
- ‘parole trisdruciole’ have stress on the fifth to the last syllable, as in *òccupatene* ‘(you) deal with this’.

In the second case, accent mark ‘accento grafico’, can be either acute, as in *ventitré* ‘twenty three’ or grave, as in *carità* ‘charity’. Accent mark is fundamental in two cases:

- to correctly pronounce some monosyllable words, as for *più* ‘more, plus’, *ciò* ‘this’,
- to distinguish some monosyllable words from other homonym parts of the speech. In this case, graphical stress signals that the monosyllabic word has word stress:

Unmarked	Marked
<i>da</i> ‘from’, preposition	<i>dà</i> ‘give!’, verb
<i>di</i> ‘of’, preposition	<i>dì</i> ‘day’, noun
<i>e</i> ‘and’, conjunction	<i>è</i> ‘is’, verb
<i>la</i> ‘the’, singular feminine determinative article or pronoun	<i>là</i> ‘there’, adverb or complement of place

⁶ < http://www.treccani.it/enciclopedia/accento-fonico-prontuario_%28Enciclopedia_dell'Italiano%29/ >, December 2015.

<i>li</i> 'them', plural masculine pronoun	<i>lì</i> 'there', adverb or complement of place
<i>si</i> 'you', indefinite pronoun	<i>sì</i> 'yes', affirmative adverb
<i>se</i> 'if' or 'self', conjunction or indefinite reflexive pronoun	<i>sé</i> 'self', indefinite reflexive pronoun
<i>te</i> 'you', indirect pronoun	<i>tè</i> 'tea', noun

Table 6. Marked and unmarked Italian words.

Graphical mark is optional but recommended in case of homographs, such as

<i>càpitano</i> '(they) happen'	<i>capitàno</i> 'captain'
<i>nòcciolo</i> 'hearth (of the matter)'	<i>nocciòlo</i> 'hazelnut tree'
<i>àltero</i> 'I modify'	<i>altèro</i> 'arrogant'
<i>abbandònati</i> 'abandon yourself'	<i>abbandonàti</i> 'abandoned'
<i>sùbito</i> 'now, immediately'	<i>subìto</i> 'undergone, experienced'
<i>séguito</i> 'following, entourage'	<i>seguito</i> 'followed'

In derived and altered words, stress can be different from the original one:

<i>filosofia</i> 'philosophy' [filozo'fia]	<i>filosofico</i> 'philosophical' [filo'zofiko]
<i>ragione</i> 'reason' [ra'dzone]	<i>irragionevole</i> 'unreasonable'
<i>fiaba</i> 'fable' ['fjaba]	[irradzo'nevole]
	<i>fiabesco</i> 'fabled' [fja'besko]

However, depending upon the suffix or ending used, it is possible to predict what syllable is going to carry the stress⁷:

Examples		
Suffixes and endings for paroxytone derived words	-acchione -aio (or -aro), and -aiolo, -ale, -ese and -ame,	<i>furbacchione</i> 'old fox', <i>gelataio</i> 'ice cream maker', <i>calamaro</i> 'squid' <i>vignaiolo</i> 'winemaker', <i>globale</i> 'global',

⁷ Further information on < http://www.treccani.it/enciclopedia/accento-fonico-prontuario_%28Enciclopedia_dell'Italiano%29/ >, December 2015.

	<i>francese</i> 'French', <i>fogliame</i> 'foliage',
-ano,	<i>romano</i> 'roman',
-ario, -eria,	<i>scenario</i> 'scenario', <i>pizzeria</i> 'pizzeria',
-ata, -eta and -eto,	<i>camminata</i> 'walk' <i>pineta</i> 'pine forest' <i>querceto</i> 'oak forest',
-icciolo,	<i>muricciolo</i> 'little wall',
-iera, -iere and -iero,	<i>oliera</i> 'oil jug', <i>cameriere</i> 'waiter', <i>mattiniero</i> 'early-rising, morning',
-ificio,	<i>panificio</i> 'bakery',
-ile, -ite, -ivo and - ino,	<i>ovile</i> 'sheep pen', <i>polmonite</i> 'pneumonia', <i>lavorativo</i> 'working', <i>marino</i> 'marine', <i>amicizia</i> 'friendship',
-izia and -izio,	<i>redditizio</i> 'profitable', <i>mieloma</i> 'myeloma',
-oma and -one,	<i>librone</i> 'big tick book', <i>professore</i> 'professor, teacher',
-ore and -tore,	<i>lavoratore</i> 'worker', <i>ferroso</i> 'ferrous',
-oso and -sorio,	<i>provvisorio</i> 'temporary', <i>mattatoio</i> 'slaughterhouse',
-toio and -torio,	<i>respiratorio</i> 'respiratory', <i>levatrice</i> 'obstetrician, midwife',
-trice,	<i>sudiciume</i> 'dirt, soil',
-ume,	<i>stiratura</i> 'ironing, straightening',
-ura and -uro,	<i>fluoruro</i> 'fluoride', <i>registrazione</i> 'registration'.
-zione.	

Suffixes and endings for proparoxytone words	-abile, -evole and derived <i>ibile</i> , -aceo and -aneo, -aggine and -agine, -astico, -cefalo, -crate, -crono, -gono and -dromo, -edine, -esimo, -fago, -fero and -filo, -fobo, -fono and fugo, -gamo and -geno, -grafo, -iciattolo, -ico and -ifico, -iggine and -igine, -ineo, -logo, -sofo, and nomo,	- adorabile 'lovable', <i>udibile</i> 'audible', <i>fuggevole</i> 'passing, short-lived', <i>violaceo</i> 'violet', <i>estraneo</i> 'foreign, unknown', <i>testardaggine</i> 'stubbornness', <i>compagine</i> 'assortment, group', <i>entusiastico</i> 'enthusiastic', <i>encefalo</i> 'encephalon', <i>burocrate</i> 'burocrate', <i>asincrono</i> 'asynchronous', <i>pentagono</i> 'pentagon', <i>ippodromo</i> 'racetrack', <i>acredine</i> 'bitterness', <i>battesimo</i> 'baptism, initiation', <i>esofago</i> 'esophagus', <i>fiammifero</i> 'matchstick', <i>cinofilo</i> 'dog lover', <i>agorafobo</i> 'agoraphobic', <i>telefono</i> 'telephone', <i>centrifugo</i> 'centrifugal', <i>bigamo</i> 'bigamous', <i>ansigeno</i> 'that causes anxiety', <i>storiografo</i> 'historiographer', <i>vermicciattolo</i> 'little dirty worm', <i>economico</i> 'economical', <i>magnifico</i> 'magnificent', <i>lentiggine</i> 'freckle', <i>origine</i> 'origin', <i>fulmineo</i> 'lightning quick', <i>teologo</i> 'theologian', <i>filosofo</i> 'philosopher', <i>economo</i> 'bursar', <i>grafomane</i> 'compulsive <i>scribbler</i> ',
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	<i>chilometro</i> ‘ <i>chilometer</i> ’,
- <i>mane</i> and - <i>metro</i> ,	<i>giallognolo</i> ‘ <i>yellowish, dirty yellow</i> ’,
- <i>ognolo</i> and - <i>oide</i> ,	<i>intellettualoide</i> ‘ <i>pseudo-</i>
- <i>pede</i> ,	<i>intellectual</i> ’,
	<i>bipede</i> ‘ <i>biped</i> ’,
- <i>istico</i> ,	<i>materialistico</i> ‘ <i>materialistic</i> ’,
- <i>itudine</i> ,	<i>inquietudine</i> ‘ <i>apprehension</i> ’,
- <i>sono</i> and - <i>stato</i> ,	<i>unisono</i> ‘ <i>unison</i> ’,
	<i>aerostato</i> ‘ <i>aerostat</i> ’,
- <i>tesi</i> and - <i>ttero</i> ,	<i>antitesi</i> ‘ <i>antithesis</i> ’,
- <i>viro</i> and - <i>vor</i> .	<i>elicottero</i> ‘ <i>helicopter</i> ’,
	<i>triumviro</i> ‘ <i>triumvir</i> ’,
	<i>onnivoro</i> ‘ <i>onmivorous</i> ’.

Table 7. Suffixes and stress in Italian.

Finally, there are cases when accent mark is erroneously used instead of apostrophe:

*un *pò* ‘*some*’

**dì* ‘*(you) say*’

**dò* ‘*(I) give!*’

*a *mò di* ‘*as a, in the guise of*’

3.3 The English phoneme system

As Moats (2010) reports, English orthography is very often described as «crazy, irregular, or unduly complex» (p. 10). This erroneous misconception can be corrected if a description of the English writing system is viewed through a historical and evolutionary perspective. Indeed, current English orthography is the result of many and different word origins that influenced it. So words that do not display direct relationship with their sound have the oldest origins, so Germanic, or Anglo-Saxon language, whereas those coming from Latin or Greek still maintain more consistent spellings and pronunciations. However, such an

explanation goes beyond the scope of the present work (for accurate and reasoned reviews, see Moats, 2010, pp. 79-152; Henry M.K., 2011).

As a result, most of modern English orthography is predictable to a large extent, thus teachable (Moats, 2010). In contrast with the 26 graphemes of the Roman alphabet, English uses more than 250 graphemic combinations to spell its 44 phonemes.

3.3.1 Vowels

English vowel system is complex as it comprises short and long vowels, as well as diphthongs. Below, their distribution appears in the shape of a triangle (Moats, 2010):

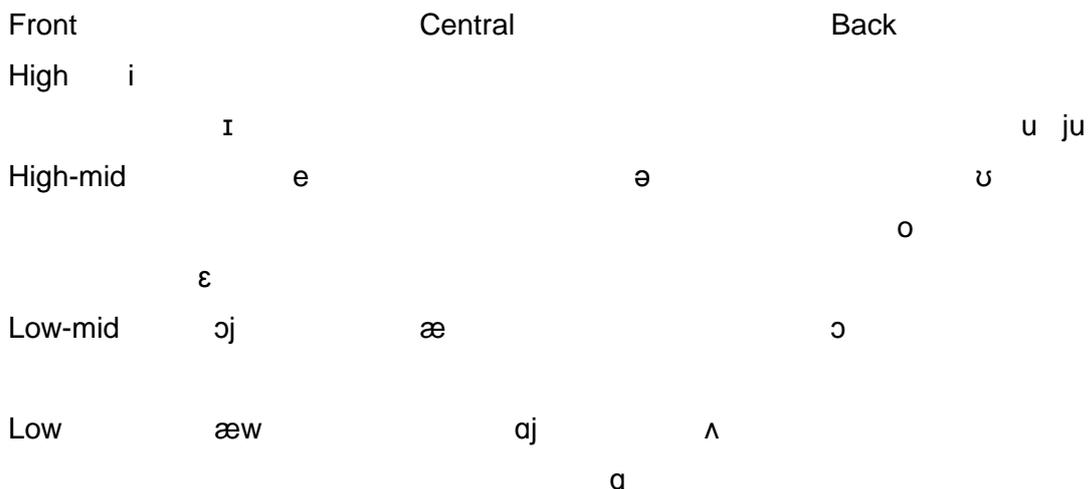


Figure 6. The English vowel triangle.

Short vowels are:

[æ] as in *apple* 'mela',

[ɛ] as in *egg* 'uovo',

[ɪ] as in *igloo* 'igloo',

[ɑ] as in *octopus* 'piovra',

[ʌ] as in *sun* 'sole'.

Long vowels are:

[ei] as in *make* 'fare',

[i:] as in *feet* 'piedi',

[ɑ:] as in *time* 'tempo',

[ɔ:] as in *pole* 'polo, asta',

[u:] as in *tube* 'tubo'.

3.3.1.1 Silent e

Even though it is not pronounced, silent e in one-syllable words signals that the word contains a long vowel. Sometimes it also changes the meaning:

mat 'zerbino' [mæt]

mate 'compagno' [meɪ:t]

pet 'cucciolo' [pet]

Pete 'diminutivo di Peter' [pi:t]

kit 'serie di attrezzi e strumenti' [kɪt]

kite 'aquilone' [kaɪ:t]

hop 'salto, saltare' [hɒ:p]

hope 'speranza' [həʊ:p]

cut 'tagliare' [kʌt]

cute 'carino, tenero' [kju:t]

This spelling rule is usually valid, although some exceptions are possible as for:

**whal*

whale 'balena' [weɪl]

set 'serie di diversi elementi' [set]

**sete*

**ris*

rise 'aumentare' [raɪ:z]

**som*

some 'alcuni, un po'' [sʌm]

mud 'fango' [mʌd]

**mude*

3.3.1.2 Diphthongs

Among the most common diphthongs of English are those comprised of two vowels and also *y*, *r*, and *w*. It should be noted that they are grouped according to their articulatory features and some diphthongs may have alternate pronunciations, as indicated below:

Diphthongs	Examples
ee [i:], ea [i:], ei [i:], ie [i:], ey [i]	<i>bee</i> 'ape', <i>bead</i> 'perla', <i>seize</i> 'cogliere, afferrare', <i>field</i> 'campo', 'denaro, soldi'
ai [eɪ], ay [eɪ], ei [i:], eigh [eɪ], ey [eɪ]	<i>bait</i> 'esca', <i>May</i> 'maggio', <i>receive</i> 'ricevere', <i>weigh</i> 'pesare', <i>hey</i> 'ehi'
ea [æ]	<i>head</i> 'testa'
ie [aɪ], igh [aɪ]	<i>tie</i> 'cravatta, legare', <i>high</i> 'alto'
oa [oʊ], ow [oʊ], oe [oʊ], ough [oʊ]	<i>boat</i> 'barca', <i>low</i> 'basso', <i>toes</i> 'dita dei piedi', <i>although</i> 'sebbene'
ue [u:], ui [u:] or [ɪ], ew [ju:], ou [u], ough [u]	<i>blue</i> 'blu', <i>fruit</i> 'frutta', <i>building</i> 'edificio, costruzione', <i>few</i> 'pochi', <i>soup</i> 'zuppa', <i>through</i> 'oltre, attraverso'
au [ɔ:], aw [ɔ:], augh [ɑ:f]	<i>fault</i> 'colpa', <i>claws</i> 'artigli', <i>laugh</i> 'risata'
oo [u:] or [ʊ]	<i>boots</i> 'stivali', <i>hook</i> 'gancio, uncino'
ou [ʊ], ow [aʊ]	<i>could</i> 'potrei', <i>now</i> 'adesso',
oi [ɔɪ], oy [ɔɪ]	<i>tinfoil</i> 'alluminio per alimenti', <i>boy</i> 'ragazzo'
ear [ɪə], eer [ɪə], air [ɛə], oar [ɔ:ɹ], our [aʊə]	<i>fear</i> 'paura', <i>beer</i> 'birra', <i>hair</i> 'capelli', <i>board</i> 'tavola, asse', <i>flour</i> 'farina'
er [ə], ar [ə], or [ə], ur [ə:ɹ], ir [ɛ:ɹ]	<i>dancer</i> 'ballerino', <i>stellar</i> 'stellare', <i>doctor</i> 'dottore', <i>fur</i> 'pelliccia', <i>sir</i> 'signore'

Table 8. Diphthongs of English.

3.3.2 Consonants

As far as consonants are concerned, English orthography comprises single letters, as well as digraphs (two-letter combinations), trigraphs (three-letter combinations), and geminates, or doubles. Below, the traditional classification (cf. Maturi, 2006; Moats, 2010):

	Bila- bial	Labioden- tal	Den- tal	Alveolar	Post alveolar	Palatal	Velar	Glottal
Plosive	p b			t d			k g	
Nasal	m			n			ŋ	
Trill				r				
Fricative		f v	θ ð	s z	ʃ ʒ			h
Affricate					tʃ dʒ			
Approximant				ɹ		j	ɹ w	
Lateral				l				

Table 9. The English consonant system.

3.3.2.1 Double consonants

Except for *h, j, k, x, v,* and *w*, all consonant of English can be doubled in the written form. The purpose is to signal the short vowel in some cases or to indicate the presence of a prefix:

bb as in *bubble* 'bolla', *abbreviation* 'abbreviazione',

cc as in *accord* 'accordo', *account* 'conto',

dd as in *puddle* 'pozzanghera', *cuddle* 'coccole',

ff as in *bluff* 'truffa', *puff* 'sbuffo', *nuvola*,

gg as in *luggage* 'bagagli', *eggs* 'uovo',

ll as in *ball* 'palla', *call* 'chiamata, chiamare',

mm as in *hammer* 'martello', *pummel* 'prendere a pugni',

nn as in *announcement* 'annuncio', *funny* 'strano, insolito',

pp as in *apple* 'mela', *suppose* 'supporre',

rr as in *carry* 'trasportare', *merry* 'allegro, felice',

ss as in *class* 'classe, lezione', *loss* 'perdita, mancanza',

tt as in *lottery* 'lotteria', *totter* 'barcollare',

zz as in *buzz* 'ronzio, vibrazione', *fuzzy* 'peloso, sfocato, crespo'.

Generally, monosyllabic words (mostly verbs) ending in consonants - double the final consonant in the presence of suffixes that begin with a vowel, e.g. *-ing* and *-ed*:

<i>add + -ing</i> → <i>adding</i>	<i>clap + -ed</i> → <i>clapped</i>
<i>'aggiungere</i> → <i>aggiungendo</i> '	<i>'battere le mani</i> → <i>battuto le mani</i> '
<i>put + -ing</i> → <i>putting</i>	<i>fit + -ed</i> → <i>fitted</i>
<i>'mettere</i> → <i>mettendo</i> '	<i>'andare bene</i> → <i>andato bene</i> '
<i>slam + -ing</i> → <i>slamming</i>	<i>tap + -ed</i> → <i>tapped</i>
<i>'sbattere</i> → <i>sbattendo</i> '	<i>'tamburellare</i> → <i>tamburellato</i> '

Doubles are relevant only in written language, since in the pronunciation the double sound does not differ that much. However, if double consonants are in words of two or more syllables, each consonant belong to a different syllable and, sometimes, the syllable changes from closed to open and also the length of the vowel:

<i>tun-nel</i> <i>'galleria</i> ' [ˈtʌ.nɪ]	<i>tis-sue</i> <i>'tessuto</i> ' [ˈtiː.juː]
<i>fun</i> <i>'divertimento</i> ' [fʌn]	<i>fun-ny</i> <i>'strano, insolito</i> ' [ˈfʌ.ni]
<i>add</i> <i>'aggiungere</i> ' [æd]	<i>ad-di-tion</i> <i>'addizione, aggiunta</i> ' [əˈdiːʃn]

3.3.2.2 Digraphs and trigraphs

The most common digraphs and trigraphs of English are:

<i>wh</i>	[w]	<i>what</i> <i>'cosa</i> ', <i>when</i> <i>'quando</i> '
<i>th</i>	[θ]	<i>thin</i> <i>'sottile, fine</i> '
	[ð]	<i>then</i> <i>'poi</i> '
<i>sh</i>	[ʃ]	<i>shoes</i> <i>'scarpe</i> ', <i>leash</i> <i>'guinzaglio</i> '
<i>ph</i>	[f]	<i>aphorism</i> <i>'aforisma</i> ', <i>euphoric</i> <i>'euforico</i> '
<i>ng</i>	[ŋ]	<i>song</i> <i>'canzone</i> ', <i>shining</i> <i>'brillante</i> '
<i>ck</i>	[k]	<i>knock</i> <i>'bussare</i> ', <i>thick</i> <i>'non sottile</i> '
<i>gh, ght</i>		<i>high</i> <i>'alto</i> ' [haɪ], <i>fight</i> <i>'lotta</i> ' [faɪt]
<i>ch, tch</i>	[tʃ]	<i>punch</i> <i>'pugno</i> ', <i>stitch</i> <i>'punto di cucito</i> '
	[k]	<i>technical</i> <i>'tecnico</i> '
<i>ge, dge</i>	[dʒ]	<i>page</i> <i>'pagina</i> ', <i>bridge</i> <i>'ponte</i> '

3.3.2.3 Silent letter combinations

In silent letter combinations, one of the letters is silent:

<i>gn</i>	[n]	<i>gnome</i> 'gnomo'
<i>kn</i>	[n]	<i>knife</i> 'coltello'
<i>lk</i>	[k]	<i>chalk</i> 'gesso'
<i>lm</i>	[m]	<i>calm</i> 'calma'
<i>mb</i>	[m]	<i>thumb</i> 'pollice'
<i>mn</i>	[m]	<i>column</i> 'colonna'
<i>ps</i>	[s]	<i>psychology</i> 'psicologia'
<i>rh</i>	[r]	<i>rhythm</i> 'ritmo'
<i>wr</i>	[r]	<i>wrap</i> 'incarto, incartare'

3.3.2.4 Syllable segments

Finally, there are some syllable segments that have a fixed pronunciation:

<i>-able</i>	[bəl]	<i>understandable</i> 'comprensibile'
<i>-cian</i>	[ʃən]	<i>magician</i> 'mago'
<i>-dge</i>	[dʒ]	<i>bridge</i> 'ponte'
<i>-dle</i>	[dəl]	<i>candle</i> 'candela'
<i>-ful</i>	[fəl]	<i>cheerful</i> 'solare'
<i>-ment</i>	[mənt]	<i>government</i> 'governo'
<i>-ous</i>	[əs]	<i>fabulous</i> 'favoloso'
<i>-sion</i>	[ʒən]	<i>passion</i> 'passione'
<i>-tion</i>	[ʃən]	<i>organization</i> 'organizzazione'
<i>-ture</i>	[tʃər]	<i>nature</i> 'natura'

3.3.3 Stress

English is a stress-time language, although it does not signal it through accent marks. Consequently, apart from monosyllabic words, every multisyllabic word has a primary stress and, sometimes, also a secondary stress applied as part of the word's form:

phrase 'frase' [freɪz]
baker 'panettiere' ['beɪkər]
pollution 'inquinamento' [pə'luːʃn]
unpredictable 'imprevedibile' [ˌʌnpɪrɪ'dɪktəbl]
representation 'rappresentazione' [ˌreprɪzen'teɪʃn]
correspondingly 'rispettivamente' [ˌkɔːrə'spɔːndɪŋ]

However, there are some cases when putting stress on a different syllable changes the meaning:

Word	Verb	Noun
<i>contest</i>	'contestare' [kən'test]	'contestazione' ['kɔːntest]
<i>contrast</i>	'contrastare' [kən'træst]	'contrasto' ['kɔːntræst]
<i>import</i>	'importare' [ɪm'pɔːrt]	'importazione' [ɪmpɔːrt]
<i>protest</i>	'protestare' ['prɒtest]	'protesta' ['prɒtest]
<i>torment</i>	'tormentare' [tɔːr'ment]	'tormento, pena' ['tɔːrment]

Table 10. Meaning changes due to stress change.

Stress can shift to another syllable in case of derived words, since extra syllables are added:

theater 'teatro' ['θiːətər] *theatrical* 'teatrale' [θi'ætrɪkl]
history 'storia' ['hɪstri] *historical* 'storico' [hɪ'stɔːrɪkl]
ecology 'ecologia' [i'kɔːlədʒi] *ecological* 'ecologico' [ˌiːkə'lɔːdʒɪkl]

However, this follows generally consistent intonation patterns that, in any case, may vary according to country, region or dialect. Indeed, it is now very common to talk of *Englishes*, thus referring to *English-speaking* countries or cultures which, of course, do not sound the same – Great Britain, America, Canada, Australia, New Zealand, India, and South Africa.

3.4 Similarities and differences

The previous comparison between Italian and English phoneme and orthographic systems showed some interesting aspects that are worth discussing.

At first glance, English and Italian are very different from different perspectives, as the first is a morphophonemic language (Moats, 2010) and the second is a grapho-phonemic language (Graffi and Scalise, 2013). But if we take a step back, we will see that both of them comprise symbols for both vowel sounds and consonant sounds, different from other languages, e.g. Arabic and Hebrew, which mostly use consonant sounds in written language, and then add vowel sound in spoken language, thus leading to ambiguities and sometimes mistake, e.g. in the case of homographs. However, Italian and English have chosen only some sounds, and organized them differently.

3.4.1 Vowels and diphthongs

The English vowel system appears more complex and sophisticated than the Italian one: six vowel letters combined with two semivowel consonants produce more than fifty vowel sounds, comprising also diphthongs. Particularly, English vowels are divided between long and short vowels. The different articulation, or duration, of the sound is significant since it can change a word in terms of part of speech or meaning:

<i>bit</i> 'pezzo, parte'	<i>bite</i> 'morso'	<i>beat</i> 'picchiare'
<i>pen</i> 'penna'	<i>pan</i> 'padella'	* <i>pean</i>

Generally, diphthongs have stable pronunciations. For example, *aw* is always pronounced [ɔ:] as in *claw* 'artiglio', *awesome* 'fantastico', *awful* 'orribile'. Moreover, [flɔ:] and [fləʊ] are pronounced differently not because of a particular accent or inflection, but because of the different diphthongs they feature, that change not only the spelling (*flaw* and *flow*) but also the meaning, e.g., 'difetto, imperfezione' and 'flusso, corrente'. However, some diphthongs change their pronunciation depending on word origin of the same, as for *ow* which can sound like [oʊ] as in *slow* 'lento', *own* 'possedere', *bow* 'inchinarsi', and [aʊ] as in *howl* 'gufo, civetta', *cow* 'mucca', *clown* 'pagliaccio'. In such cases, it is mandatory to

model and elicit from the first presentation of words, the correct pronunciation of each word, so that it is possible to correct it systematically and quickly in case of erroneous pronunciation or improper decoding.

In contrast, Italian vowel system is smaller and simpler: five vowel letters, seven vowel sounds, and about twenty diphthongs. However, the seven-vowel selection is part of the heritage that Latin has left to Italian (Coletti, 2015) so it is not present in all varieties of Italian. In some varieties, there are only five vowels (Avolio, 2009; Graffi and Scalise, 2013).

In standard Italian a similar difference would be not only present, but also decisive for the meaning of the word. In standard Italian, the graphemes *e* and *o* have two different phonemic realisation, as in the following examples:

<i>pesca</i>	[ˈpeska] ‘fishing’	[ˈpɛska] ‘the fruit of peach tree’
<i>venti</i>	[ˈventi] ‘twenty’	[ˈvɛnti] ‘winds’
<i>botte</i>	[ˈbotte] ‘barrel’	[ˈbɔtte] ‘hits, damages, bumps’
<i>colto</i>	[ˈkɔlto] ‘educated, cultured’	[ˈkɔlto] ‘picked up, harvested’

Some examples of minimal pairs in Italian with vowels are the following:

- *a* vs. *e*

<i>banda</i> ‘band’ [ˈbɒnda]	<i>benda</i> ‘bandage’ [ˈbɛnda]
<i>lava</i> ‘lava’ [ˈlava]	<i>leva</i> ‘lever’ [ˈlɛva]
<i>balli</i> ‘dances’ [ˈballi]	<i>belli</i> ‘beautiful’ [ˈbɛlli]

- *i* vs. *e*

<i>ira</i> ‘rage’ [ˈira]	<i>era</i> ‘era, epoch’ [ˈɛra]
<i>piste</i> ‘tralis’ [ˈpiste]	<i>peste</i> ‘plague, pest’ [ˈpɛste]
<i>pinna</i> ‘fin’ [ˈpinna]	<i>penna</i> ‘pen’ [ˈpenna]

- *o* vs. *a*

<i>coni</i> ‘cones’ [ˈkɔni]	<i>cani</i> ‘dogs’ [ˈkani]
<i>motto</i> ‘motto’ [ˈmɔtto]	<i>matto</i> ‘mad’ [ˈmatto]
<i>sole</i> ‘sun’ [ˈsole]	<i>sale</i> ‘salt’ [ˈsale]

- *u* vs. *o*

punte 'points, ends' ['punte]

culto 'worship, ritual' ['kulto]

munte 'milked' ['munte]

ponte 'bridge' ['ponte]

colto 'cultured, picked up' ['kolto]

monte 'mountain' ['monte]

As speakers first and then as linguists, we should pay more attention to the real use of language (spoken Italian) which sometimes is very distant from the *norm* (standard Italian). Therefore, in the commonly spoken Italian open and closed vowels only indicate something about the geographical origin of the speaker. In contrast, different vowels can change the meaning of words leading to the conclusion that, in spoken Italian, minimal pairs are present only with different vowels.

3.4.2 Consonants, digraphs and trigraphs

The English consonant system seems more reduced although less consistent than the Italian one. Indeed, fifteen consonant letters are organized in more than twenty comprising digraphs and letter combinations, and some of them can have more than a possible pronunciation. But the pronunciation seems to follow some constant patterns that, if taught explicitly, allow beginners to predict both their spelling and their pronunciations.

For examples, the digraphs *wh*, *sh*, and *ph* are pronounced always in the same way, respectively [w] as *which* 'quale', *whip* 'frusta', [ʃ] in *cash* 'cassa, denaro contante', *wish* 'desiderio, augurio', [f] as in *telephone* 'telefono', *phrase* 'frase'.

However, words like *height* 'altezza' and *eight* 'otto' are pronounced differently (respectively [haɪt] and [eɪt]), although they both contain the trigraph *ght* and the first one differs only for the initial aspirate *h*. Of course, this is an exception, so it is generally advisable first to teach the general pronunciation rule, and then to present all of the different pronunciations.

Conversely, Italian consonants seem to show a more consistent correspondence between grapheme and phoneme. If standard Italian is taken into consideration,

it should be said that it follows IPA's spelling prescriptions, so some grapheme can have more than one possible pronunciations (Graffi and Scalise, 2013):

a	b	c		d	e		f	g		h	i			l	m		n	
a	b	tʃ	k	d	e	ɛ	f	dʒ	g	ø	i	j	ø	l	m	ɱ	n	ɲ

o		p	q	r	s		t	u		v	z	
o	ɔ	p	k	r	s	z	t	u	w	v	ts	dz

Table 11. Grapheme-phonemes correspondences in Italian.

Consequently, the orthography of Italian seems not as transparent as it is believed. In fact, eleven letters out of twenty-six can have *at least* two different phonetic realisations. However, this distinction in spoken Italian is even more evident from one region to another. Avolio (2009) explains and describes these phenomena in a historical perspective. In fact, he states that present regional pronunciation varieties are directly influenced by regional dialects which are, in turn, different from one another because of the different linguistic substrata of foreign dominations in history. Below, some examples (Avolio, 2009):

	Phenomenon	Linguistic context	Example	Area and region
s > š	palatalization	within word	<i>coša</i> for <i>cosa</i> 'thing, what'	North Italy (Emilia-Romagna)
z > s	desonorization	within word	<i>mossarella</i> for <i>mozzarella</i> 'mozzarella'	North Italy (Emilia-Romagna)
s > z	affrication	after <i>l, n, r</i>	<i>forze</i> for <i>forse</i> 'maybe'	Centre Italy (Lazio)
s > š	palatalization	before consonant	<i>šcarpa</i> for <i>scarpa</i> 'shoe'	Centre Italy (Abruzzo, Marche, Molise)

palatal <i>b, g</i>	palatalization	between vowels	<i>àbbito</i> for <i>abito</i> 'dress'	Centre (Lazio)	Italy
<i>z > ź</i>	Desonorization (Latin -tj- vs. Italian -ctj-)	before <i>i</i>	<i>stazióne</i> for <i>stazione</i> 'stazione'	Centre and South (Marche, Abruzzo, Apulia)	Italy
<i>s > z</i>	nasalization	after <i>n, m</i>	<i>inzómma</i> for <i>insomma</i> 'hence'	South (Campania, Puglia, Basilicata, Sicily)	Italy
<i>p, t, k > b, d, g</i>	sonorization (postnasal lenition)	after <i>n, m</i>	<i>anghe</i> for <i>anche</i> 'also'	South (Campania, Puglia, Basilicata, Sicily)	Italy

Table 12. Phonetic phenomena in Italian dialects and non-standard varieties.

It is evident that different pronunciations can be found in every region of Italy, although the reasons may be different but, most importantly, they are explainable in terms of phonological processes. Similar speaking context may influence speakers' attitude in different ways but will not prevent them from developing a generally intact writing ability. This means that, if somebody from Bologna asks for a *pissa* in Milan, they will be understood and thus receive a *pizza*, because the other speaker immediately and automatically connected *what he heard*, e.g. phonetic form, to *what he knows*, e.g. graphemic form.

Below, some examples of phonological oppositions involving consonants:

- single consonant vs. doubles

pena 'pain' ['pena]

penna 'pen' ['pen:a]

note 'notes' ['note]

notte 'night' ['nɔt:e]

Ada 'proper female name' ['ada]

Adda 'Italian river' ['ad:a]

capelli 'hair' [ka'pel:li]
roca 'hoarse' ['rɔka]
frigo 'fridge' ['frigo]
coro 'chorus' ['kɔro]
pala 'shovel' ['pala]
base 'base' ['baze]
coma 'coma' ['kɔma]

cappelli 'hats' [ka'p:elli]
rocca 'fortress' ['rɔk:a]
friggo '(I) fry' ['frig:o]
corro '(I) run' ['ko:ro]
palla 'ball' ['pal:a]
basse 'short' [bas:e]
comma 'clause, article' ['kɔm:a]

- voiceless vs. sounded phoneme

pelare 'to peel' [pe'lare]
topo 'mouse' ['tɔpo]
foca 'seal' ['fɔka]
fetta 'slice' ['fetta]
tazza 'cup' ['tat:sa]

belare 'to bleat' [be'lare]
dopo 'then' ['dɔpo]
foga 'rush' ['fɔga]
vetta 'peak' ['vetta]
gazza 'magpie' ['gad:za]

Thus, differently from English, double consonants in Italian are relevant not only in the written but also in the oral language, since they must be pronounced clearly not to be confused with a single one. However, in both languages proper discrimination of phono-articulatory features of complementary phonemes leads to a general better comprehension.

3.5 Conclusions

It is now evident that both phonological and orthographic awareness are critical both in English and Italian, although with different degrees. On the one hand, the English vowel system is complex. In fact, it comprises a long series of diphthongs that can have different pronunciations, and short and long vowels that have precise, stable pronunciations – although they may correspond to different graphemes. As far as consonant system is concerned, it differs from the Italian one for it has different, typical consonant sounds. However, this grapheme-phoneme correspondence is generally consistent. On the other hand, Italian consonant system is more complex and less transparent than it is generally thought: in fact, some phonemes may correspond to different graphemes.

However, vowel system is simpler. Although it comprises *in theory* both open and closed vowels and diphthongs as well, *in practice* it selects only diphthongs and either open and closed vowels that vary depending upon the variety of Italian. However, this is not always consistent and cannot be described with systematic accuracy and precision.

It is evident that a different attention must be paid to the English vowel system on the one hand, and to the Italian consonant system on the other hand. Moreover, as a fluent speaker of both languages, I do consider some phonemes of English particularly difficult because of their absence in Italian, i.e. the consonants [θ, ʃ, ʌ], long vs. short vowels, and [ɔj vs. əj, ʌ vs. ɑ, æw vs. æ] and, crucially, the schwa sound [ə].

As for morphology, we would define both English and Italian as synthetic languages, with English less synthetic than Italian (more information on Eifring and Theil, 2005; Bickel, 2007). In fact, in synthetic languages words can be made up of more than one morpheme, but in this case Italian has way more inflectional morphology than English. In addition to this, Italian makes use of gender, so agreement is required, whereas English does not, generally.

3.6 Working proposal

Both the data and the observations and analysis presented here are currently being applied to the creation of original teaching and working materials to be designed specifically for challenged learners, e.g. language impaired and/or dyslexic students. The materials, based on the English language phonics program *Explode the Code*, will be applied to the Italian language, with a special attention to its phonologic and morphologic characteristics. The next chapter will include presentation and description of the materials, as well as my internship experience which, crucially, played a fundamental role in my formative and research process.

4. English language working materials

This section contains a brief description of the approach and methodology that I have adopted during my internship for my Master's Degree, completed in the laboratory *Inglese Dinamico*. Second, a specific description and analysis of the English language material that I utilized during it is presented. These materials have been designed to be used for all learners and targeted also for language-impaired children as teaching aids. Finally, I am going to present a sample of original Italian language working materials that I am designing based upon the language components and design characteristics of the English language workbooks and instruction enrichment.

4.1 My internship experience

As a graduate student at Ca' Foscari University, I have had the opportunity to complete my master's internship at the teaching laboratory *Inglese Dinamico*. Nancy Rose Steinbock, an American-trained speech/language pathologist, created *Inglese Dinamico* in 2003 in Venice, Italy. While there, I was given the opportunity to learn about and to engage in hands-on practice of its innovative and original methodology during the academic year 2014-2015. Having been involved in the project as a teacher in training, I am now able to illustrate its principles, methodology and peculiar features.

Steinbock's approach and methodology come directly from her professional field of language diagnosis and therapeutic/educational intervention, which altogether underline the importance of mastering the phonological code of a language in order to provide solid fundamentals for both speech production and literacy acquisition.

Graduate students are trained in training session conducted by Steinbock who illustrates and explains the general and specific characteristics of language acquisition for challenged and non-challenged individuals. Most importantly, the internship period was not rigidly divided into learning theory passively and then, attempting to apply it. Instead, active practice strategies and the theories underlying them are presented together. This way, students are able first to study

and analyse theories and then to enact them concretely, constantly mentored and supervised by Steinbock.

4.2 The *Inglese Dinamico* approach

The long and in-depth research that Steinbock conducted in language acquisition as well as reading and writing difficulties in childhood and adulthood has provided the basis for the program that aims at developing innovative best teaching practices for English language acquisition. Importantly, her methodology stresses a strong phonological foundation for speech and language forms, essential first for daily communication.

Literacy acquisition is acquired through simple but accurate presentation of phonics principles utilizing a step-by-step Orthon-Gillingham approach (Gillingham and Stillman, 1997), a well-recognized multisensory approach for literacy acquisition and development. In addition, text navigation and clear and meaningful writing lessons are taught with scaffolded teaching strategies, in order to promote excellence in reading comprehension and writing for multiple purposes. Scaffolded teaching takes each student's level of competence in various language areas into consideration, so that new concepts are proposed and taught gradually, in order to achieve learning success and self-confidence.

Active language strategies are another fundamental part of the *Inglese Dinamico* approach. Specifically, they focus upon the phonological elements of a language, i.e. English, so that their manipulation strengthens speech and listening skills. Consequently, vocabulary and language forms as well as gestural and social cues are produced spontaneously but within supervised situations. Critical thinking skills is developed altogether with literacy.

A distinctive feature of *Inglese Dinamico* is that second language, i.e. English, is presented through the teachers' strengthened phonological awareness, fundamental for speech production and communication. This is enacted through an orderly but dynamic methodology whose aim is to develop in a natural way, a

solid phonological coding base that enables easier acquisition of sounds, lexical and grammatical knowledge that is contained in the language students use during play and book sharing activities (Costenaro, 2006; Steinbock and Costenaro, 2005). This concept of learning by doing encourages students to produce age-appropriate and context appropriate speech and language forms relative to the activity at-hand (Dryden and Rose, 1995). Learning by doing means development as a result of first-hand experience as opposed to purely theoretical instruction. It reflects the active way in which one gains knowledge, skills and attitudes and illustrates a practical approach to education.

Interns at *Inglese Dinamico*, as interventionists and teacher-figures, are constantly encouraged to provide children correct models as well as to monitor their productions and to give them feedback, being careful to still encourage them, in a risk-free environment e.g. through suggestions and enthusiastic comments (Stokes and Whiteside, 1984). Non-verbal strategies, e.g. eye-contact, walking around the room, also plays an important role in conveying the speech and linguistic information (Costenaro, 2006; Steinbock and Costenaro, 2005).

Finally, special attention is given to contexts, cultural differences, and respect for other languages. Typical aspects of English language and culture are taught, whenever possible, contrastively and are always made easier and more explicit to facilitate acquisition of English through natural exchanges and diverse communication situations. Above all, socio-linguistic sensitivity means to respect all of the numerous varieties and forms of English.

4.3 *Explode the Code*

One of the principal series of workbooks in use at *Inglese Dinamico* laboratory is *Explode the Code* by Nancy Hall and Rena Price, a classic phonics program that has been utilized widely and for many years in the United States. It is specifically designed to build the essential literacy skills, i.e. phonological awareness, decoding, vocabulary, comprehension, fluency and spelling – skills that are fundamental for both reading and academic success.

The series comprises eight books and is the result thirty years of evidence-based and teacher-tested programs. Consequently, it is organized systematically and orderly so that abundant practice and reinforcement opportunities are given gradually. Content is accommodated upon the specific literacy necessities of challenged beginners and students of English language. Crucially, the consistent format of the exercises, simple but clear directions and concrete examples make the learning process easier and more stable.

4.3.1 Language, content organization and layout

The sound/orthography concepts are organized and presented in individual chapters. Each books contains thirteen lessons on average – ranging from eleven to fifteen. Each book contains also two or three review lessons, and a post-test section to assess students' final preparation.

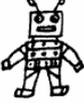
The content is organized in an orderly fashion (for Tables of Content 1 to 8, see Appendixes) to present first, the short vowels, followed by digraphs, consonant blends, long vowels and important spelling rules, such as silent e which modifies vowels sounds within syllables. Following this, systematically, more sophisticated forms such as compound words and other syllable division rules, syllabic segments, morphological markers, diphthongs, and special consonant/vowel sequences and silent consonants are presented. From Book 1 through Book 8, typology and patterns of exercises are consistent, whereas phonics principles and lexicon items as well as grammar and syntactic constructions are language-appropriate, progressive and challenging. In addition, simple but clear and immediate drawings are provided as a non-verbal clue to understand and complete the tasks.

Below are some examples of the increasing challenge of the exercises, taken from Book 4. At the beginning of each lesson, students find a simple rule, and an example, for:

- pronunciation:

RULE: When 1 consonant stands between 2 vowels, the word is usually divided after the first vowel — v/cv. The first syllable is open, and the vowel will say its name.

rō / bōt



Draw a line between the syllables so the first vowel will say its name.

Figure 7. Example of pronunciation rule.

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- spelling:

RULE: When 2 consonants that are the same stand between 2 vowels, the word is usually divided between the consonants — vc/cv.

rab / bit



Draw a line between the consonants.

Figure 8. Example of spelling rule.

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- orthography:

RULE: Sometimes an ending such as *-ful*, *-ing*, *-est*, *-ed*, or *-ness* is added to a word to make a new word.

jump + ing = jumping



Draw a line between the word and its ending.

Figure 9. Example of orthography rule.

Following exercises make students work and use the new rule, first with picture-word matching tasks, then with spelling-into-syllable tasks.

In contrast to other tasks like the grammaticality judgment tasks, the 'likelihood judgment tasks' here proposed do not make students reflect on grammatical or syntactical structures but on their knowledge of the world.

Yes or no?

	Yes	No
Can you catch a windmill?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Will a wishbone bring luck?	<input type="checkbox"/>	<input type="checkbox"/>
Can you sit on a flagpole?	<input type="checkbox"/>	<input type="checkbox"/>
Will a rosebud smell sweet?	<input type="checkbox"/>	<input type="checkbox"/>
Will a classmate sleep in a pigpen?	<input type="checkbox"/>	<input type="checkbox"/>
Are you upset if you are homesick?	<input type="checkbox"/>	<input type="checkbox"/>
Can you bake homemade cupcakes?	<input type="checkbox"/>	<input type="checkbox"/>

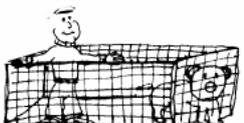
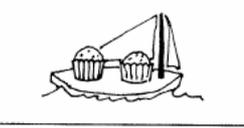
5

Figure 10. Example of likelihood judgment task.

Consequently, students are proposed questions like *Will a wishbone bring luck?* *‘L’osso di pollo può portare fortuna?’* or *Can you sit on a flagpole?* *‘Ci si può sedere sull’asta della bandiera?’*, and are asked to cross the Yes or No box. Of course, students already know the lexicon in use, which is of the same type of the lesson – in this case, compound words.

Sentence-picture matching tasks are based on the same principle.

X it.

Dave is inside the pigpen. <input checked="" type="checkbox"/>	
Dave is inside the sandbox. <input type="checkbox"/>	
Hank is glad to sit on the cupcake. <input type="checkbox"/>	
Hank is safe inside his playpen. <input type="checkbox"/>	
The baseball bat will not fit in the lunchbox. <input type="checkbox"/>	
She digs in the sandbox with a drumstick. <input type="checkbox"/>	
Gus sails in the bathtub at sunset. <input type="checkbox"/>	
Gus drops his handbag in the fishpond. <input type="checkbox"/>	
The cupcakes on the sailboat are homemade. <input type="checkbox"/>	
The flat pancakes are in the hatbox. <input type="checkbox"/>	
The big wishbone is on the lampshade. <input type="checkbox"/>	
The fishbone is stuck in the windmill. <input type="checkbox"/>	
The tomcat hunts in the trashcans. <input type="checkbox"/>	
The tomcat jumps into the dishpan. <input type="checkbox"/>	

7

Figure 11. Example of sentence-picture matching task.
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The two sentences contain words with similar sounds (*The big wishbone is on the lampshade* *‘L’osso di pollo è sul paralume’* or *The fishbone is stuck in the*

windmill 'L'osso di pollo è incastrato nel mulino') or meaning (Dave is inside the pigpen 'Dave è nel porcile' or Dave is inside the sandbox 'Dave è nel recinto di sabbia',) but only one contains the key word which, crucially, matches with the picture.

Lexical choice tasks require students to find and select the appropriate word to complete the sentences.

Pick a word to fit each sentence.

skyline	fishbone	baseball
fishpond	sunshine	flagpole
bedtime	bathtub	campfire
Let's play a game of <u>baseball</u> .		
It's fun to sit by the _____.		

Figure 12. Example of lexical choice task.

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In the initial books, the words to insert are exactly of the same number as the sentences, whereas in the intermediate and advanced book extra words are added, so that students are supposed to reflect carefully in order to make the right choice.

Finally, spelling tasks require students to spell correctly the word which goes with the picture. The skills that here are assessed are not only students' spelling and orthography abilities but also memory skills, namely word retrieval.

Write it.

	<u>sunshine</u>
	<hr/>
	<hr/>

Figure 13. Example of spelling task.

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4.3.2 Practicing linguistic and non-linguistic abilities

According to my personal experience of English language student first and later, that of teacher-in-training, I consider both the language and linguistic preparation and the handwriting instruction as additional values to this phonics course.

Indeed, in the initial books, specific exercises make students trace and copy letters, or words, from a model, thus reinforcing their graphomotor skills. In early levels, lines for spacing and size guidelines are provided. As proposed by Adams (1990, p. 357), to trace and copy letters «may contribute valuably toward the development of those fine motor skills that determine the willingness as well as the ability to write» and help in «developing necessary skills for reading as well as writing». Often, instruction in writing and spelling are already provided in kindergarten, thus before instruction in reading. During this period, teachers usually teach the names and the sounds of the letters as well as how to distinguish between upper- and lowercase letters, in order to develop children's phonemic awareness and begin phonemic segmentation (Rubin and Eberhardt,

1996). Moreover, spelling from a selection of letters, or from memory, keeps the mnemonic skills always active and trained. Morphosyntactic abilities and comprehension are enhanced through word building and writing of short answer to comprehension questions.

In addition to these exercises, teachers can propose extra, spontaneous practice, if there is the occasion. For instance, 'likelihood judgment' tasks can be used by teachers to practice construction of simple statements, i.e. answers, both positive and negative. Also, if a student provides the wrong answer to picture-word and sentence-picture matching tasks, teachers can help the student reason and find the right answer, trying with meaningful sentences with the target word, or with examples from everyday life. In this way, learning targets are inserted in a different framework, e.g. *students'* framework, so that teachers can draw on their language and personal background knowledge in order to build new learning. This crucial strategy is useful and effective for *every* student, challenged and non-challenged, as the teacher has the opportunity to show students a new, different learning strategy to learn which they can use in each and every learning contexts, academic and not.

Positive reinforcement and comments are necessary at every learning stage, especially for challenged students, e.g. language impaired or dyslexic students, who often experience literacy or language difficulties and may become easily frustrated or demoralized. In such cases, it is fundamental that intervention must be conducted on all of these diverse but interdependent linguistic and non-linguistic areas because «[w]hen a child struggles with written language, none of the myriad layers of language processing can be taken for granted» (Birsh, 2011, p. 2).

In the next chapter I will propose some original working materials in Italian which have been designed taking previous research in dyslexia disorder (see chapter 2) into consideration, as well as comparison between English and Italian phoneme systems, orthographies and morphologies (see chapter 3), and finally

key language and layout characteristics of *Explode the Code* phonics book series.

5. Italian language working materials

«It's time to see what I can do, to test the limits and break through»

(Elsa, *Let it go*)

As we have already seen in chapter 2, most of research conducted over decades has been with regard to English, a language with a dense orthography. In dense orthographies, such as English and French, a grapheme-to-phoneme conversion makes sounds accessible to speakers, as this correspondence is not always consistent.

Previous research identified, as best predictor for dyslexia, phonological awareness ability which comprises letter knowledge (Stein and Walsh, 1997; Wright et al., 2000), rapid automatized naming (Mattingly, 1972; Landerl et al., 2012), as well as short-term memory, pseudo-word or non-word repetition, and expressive vocabulary (Perfetti and Lesgold, 1979; Katz et al., 1982; Liberman et al., 1982). The role played by phonological awareness components in the literacy process is acknowledged (Scarborough, 1990; Landerl and Wimmer, 2000; Share, 2008; Ziegler et al., 2010; Boets et al., 2010) in both shallow and transparent orthographies. However, there is less agreement on the real weight of phonological awareness in the development of dyslexia in transparent orthographies. These factors cannot be considered as a *conditio sine qua non* for dyslexia in general, as they were found to be valid with regard to English language.

A predictive study by Goswami (2008) proposed that children's early skills are in use when learning reading and writing, but it still unknown to what extent. Future study would help understanding whether a phonological awareness deficit is a cause or an effect of dyslexia. With regard to Italian, Pinto et al. (2009) investigated the role of emergent literacy skills as opposed to formal literacy skills. With *emergent literacy skills*, we refer to that set of inner abilities, linguistic and non-linguistic, that children already possess before *formal literacy*. Conversely,

formal literacy is the literacy acquisition process that begins in elementary school. Their model excluded general cognitive-linguistic abilities but included *textual competence* (to understand individual units of meaning conveyed by words, and to put the words within a text in relationship) and *conceptual knowledge on writing systems* (to know and use the visual attributes of the letters within words). These abilities are purely linguistic, so the study did not rely on only one single factor, or variable, as there is strong evidence that these emergent literacy skills can be improved, and thus that dyslexia can be prevented, or at least minimized (Lonigan et al., 2013).

5.1 Work proposal

This work is concerned with the language-learning disorder typically diagnosed as 'dyslexia', with a special focus on dyslexia in Italian. During my academic and internship experiences, I had the chance to first study dyslexia learning impairment and then to see how it manifests concretely. This has had a large, fundamental impact on my knowledge of the topic, as it allowed me to reflect upon some hypothesis in the field. Moreover, I was able to notice that there were as many approaches as many languages were investigated (see paragraph 1.4). However, a phonological explanation to the disorder was always recurrent – something that I could personally notice during my internship hours and that was true for both dyslexic and typical students. Crucially, this inspired my thesis proposal, which consists in original Italian language materials, specifically designed for language impaired students.

5.1.1 Language and graphical characteristics

The criteria taken into consideration for creating and designing these materials are:

- the layout characteristics of *Explode the Code*. As we have seen in section 4.3.1, all the exercises have a simple structure and a clear font. When the task of the exercise requires it, immediate black and white drawings are added. The basic layout of exercises and the black and white style are not downsides, for a teacher can decide to use colours, for example, to highlight important

sounds, or to emphasize an important structure. Relying on visual clues, e.g. colours or small drawings, can be an effective strategy to help students who tend to use more such non-linguistic clues. Finally, much space is present, so that students have enough space to write in and can make notes and add additional information to support learning;

- the language characteristics of *Explode the Code*. As already mentioned in section 4.3.1, the language used throughout the eight book series is simple, clear and consistent. Each lesson begin with a (phonetic, spelling, or grammatical) rule that exposes the use in a simple but effective words, and an example. The tasks are given with simple active sentences and, sometimes shapes are used in place of words, as for  for *circle* or *X it* for *cross it*;
- concepts and contents are presented in a progressive and challenging way. The contents are organized upon the hierarchical structure of language, from the smallest and more simple to largest and more complex. This increasing difficulty allows teachers not only to decide from which book have students start, but also to have a stable lesson plan;
- typology and lexicon of exercises are language appropriate. The series is organized into language levels, and not upon school grades. This means that students of different ages but of similar competence could be working together, thus allowing teachers to have them co-teach each other, with a continuous exchange of knowledge. In addition, the lexicon is close to students' everyday life experience, so that every student completes the task without much difficulty. Coming to the typology of exercises, initial books present easy word- or picture-matching tasks, whereas advanced books also have crossword tasks, word-definition matching tasks and sentence completion tasks, which require higher skills and deeper language knowledge;
- the illustrations are simple and clear and provide non-linguistic but, sometimes, fundamental information. They are large and immediate enough to convey the targeted meaning without distracting students from the real objective, that is language.

5.1.2 Organization of content

As a consequence of the linguistic comparison and analysis conducted in chapter 3, and of the previous consideration on the *Explode the Code* books, I have given less space to phonemic segmentation of vowel and diphthongs, which is presented in *Explode the Code* in books 1, 3, 4, 5 and 6. Similarly to the language workbooks, pre- and post-tests have been kept, since preliminary and final assessment of knowledge is a fundamental part of the teaching and learning processes. Conversely, I have added more Review Lessons at the end of fundamental concepts, as phonological oppositions of vowel or consonants.

Segmentation of other phonemes, e.g. post-alveolar and velar *c* and *g*, would be comprised in volume 2, together with digraphs, e.g. *ch*, *gh*, *sc*, *gn*, *gl*, *cu*, *qu*, and *cqu*. Also, lexical development sections have been planned in case of particular topics, e.g. orthographic difference between *cu* and *qu* as well as *qu* and *cqu*, or *gli* and *li*, or *gni* and *ni* – phonological concepts that, if not properly decoded, sometimes are difficult also for non-challenged learners.

Syllable division, double consonants, and consonant clusters, e.g. *mb*, *mp*, *nd*, and *nt*, would be comprised in book 3, with more lexical development sections on words with the final syllable in common, single and double consonants, different double consonants that correlate with a change in meaning, and derived words.

5.1.3 Table of content and exercises

However, for reasons due to time and space, I have planned the tables of content of a preschool volume, of three schooling volumes (see Appendixes), and designed some exercises for volume 1. Particularly, in order to exemplify the overall and internal organization, the sections that I have designed are the Consonant pre-test, Lessons 1 and 6, the second review Lesson, and the Post-test.

Below is the table of contents of volume 1.

Consonant pre-test

Lesson 1: A

Lesson 2: E

Lesson 3: I

Review Lesson

Lesson 4: O

Lesson 5: U

Review Lesson

Lesson 6: B and P

Lesson 7: D and T

Review Lesson

Lesson 8: F and V

Lesson 9: L and R

Review Lesson

Lesson 10: M and N

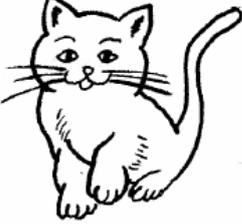
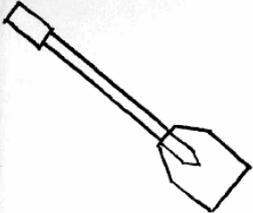
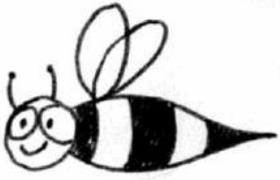
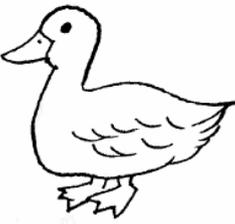
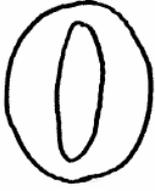
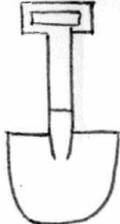
Lesson 11: S and Z

Review Lesson

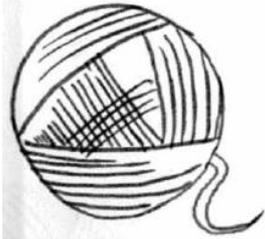
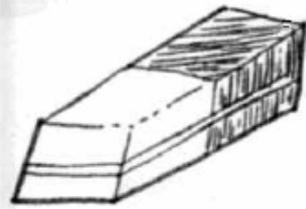
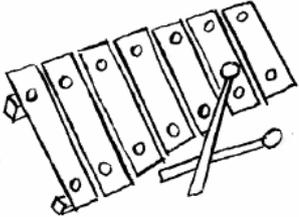
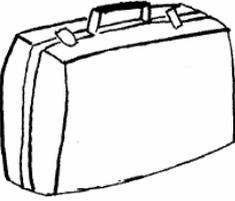
Post-test

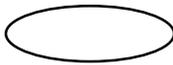
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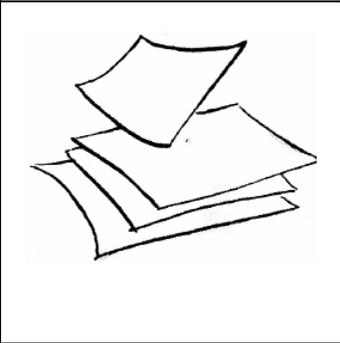
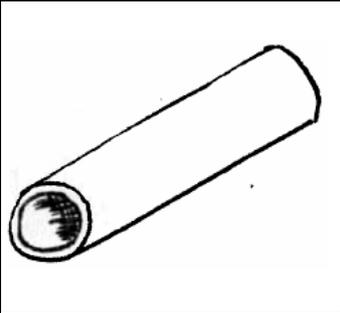
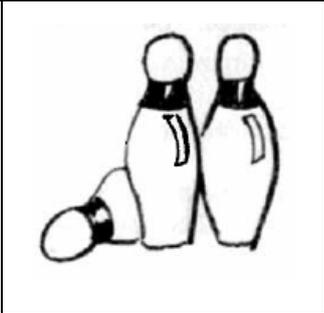
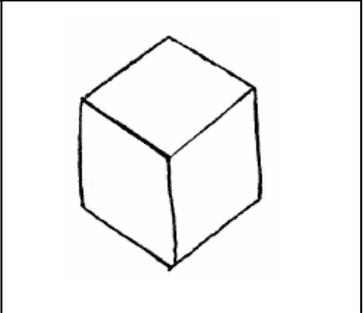
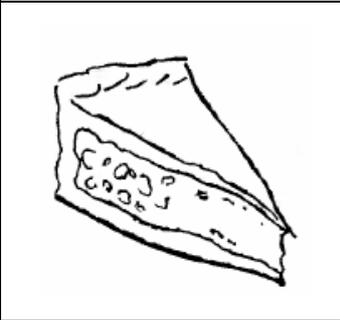
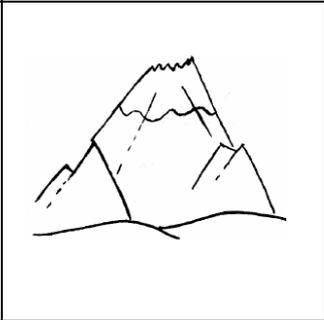
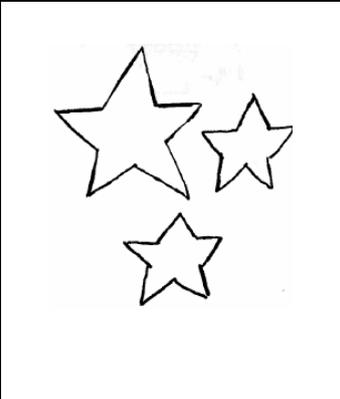
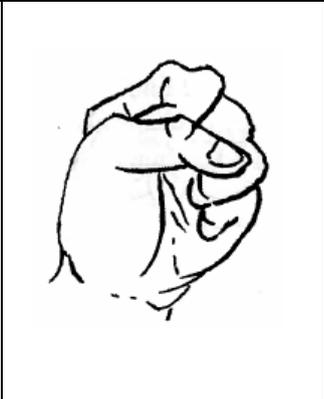
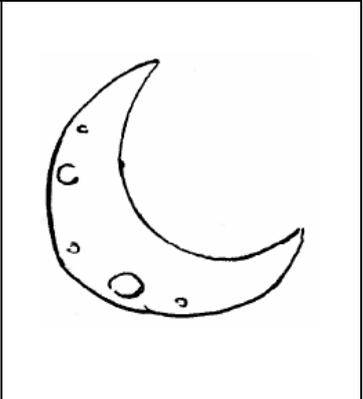
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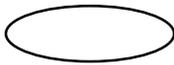
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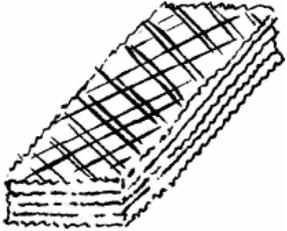
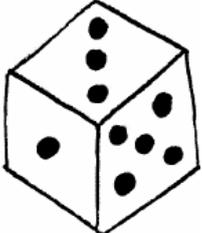
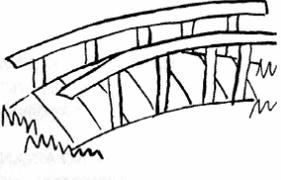
r			
g			$1+2=3$
x			
n			
v			

 il disegno giusto.

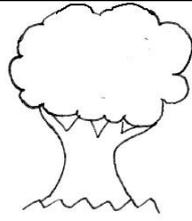
b			
j			
t			
f			
l			



il disegno giusto.

w			
d			
y			
q			
h			

Lezione 1



a come

Trova l'immagine che inizia con il suono della lettera indicata e .

a			
a			
a			
a			
a			

○ la stessa parola.

amo	amo	ago
alce	alce	falce
amaca	anta	amaca
astro	asso	astro
anello	aneto	anello
aria	aria	aereo
amico	manico	amico
ala	ala	sala
arco	arto	arco



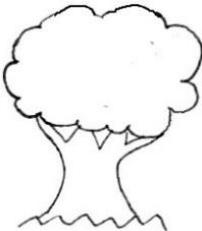
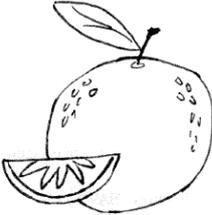
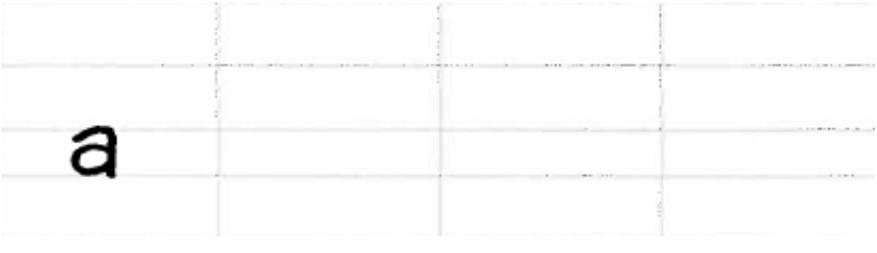
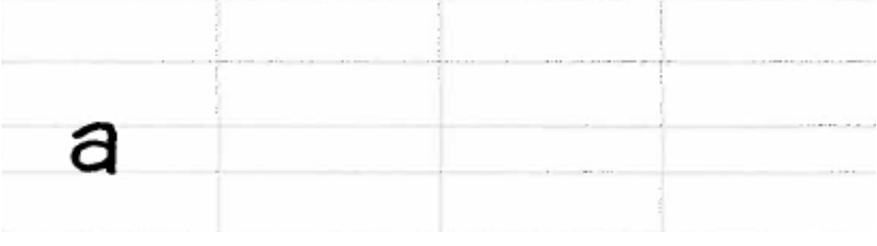
Segui le frecce per scrivere la lettera **a** di  . Pronuncia il suono ad alta voce.



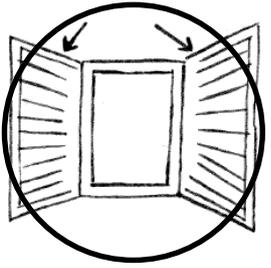
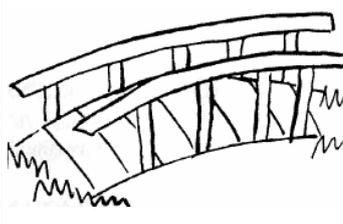
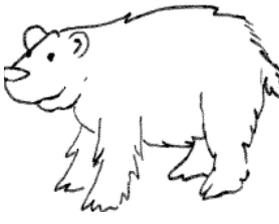
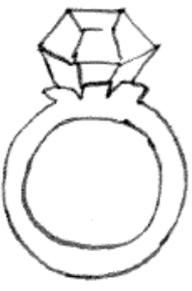
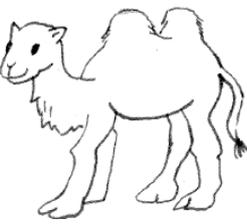
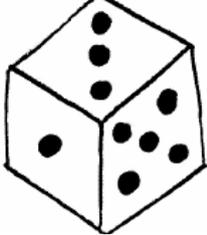
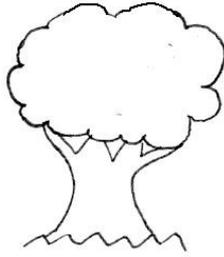
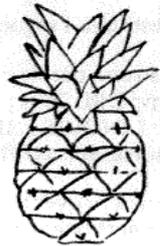
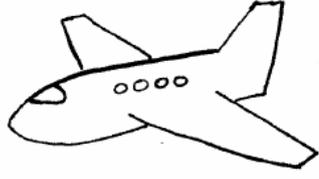
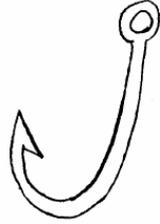
Fai attenzione: **a** è alta un solo spazio. Traccia le lettere.



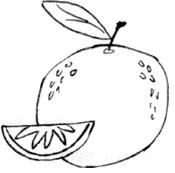
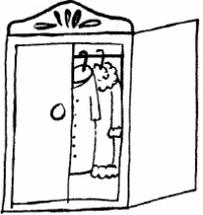
Traccia e copia la lettera che corrisponde al suono iniziale dell'immagine indicata.

Leggi, copia e la parola corrispondente.

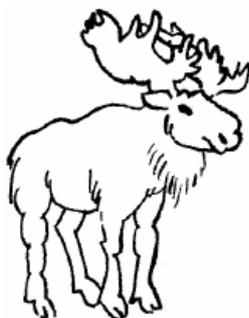
<p>ante</p> <p><u>ante</u></p>			
<p>asso</p> <p>_____</p>			
<p>anello</p> <p>_____</p>			
<p>ago</p> <p>_____</p>			
<p>aereo</p> <p>_____</p>			
<p>amo</p> <p>_____</p>			

○ le lettere e componi le parole. Poi scrivi.

	ge a ran ren	cia nio	<u>arancia</u>	
	al po	be ve	ro li	_____
	ge a	gnel nel	lo ro	_____
	a ba	na ma	stro nas	_____
	ri an	go co	ra la	_____
	ba a	nel mer	so lo	_____
	a pa	be pe	de te	_____
	ra ar	ma la	dio pio	_____

Abbina le parole con i disegni e scrivile.

ago arancia arco abete
anello ~~alce~~ ancora aereo

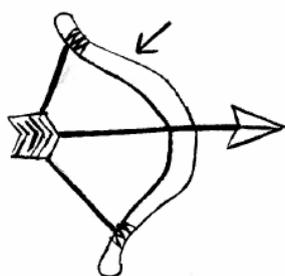


alce



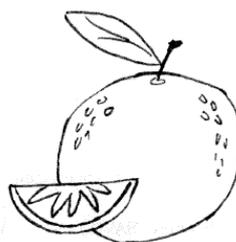




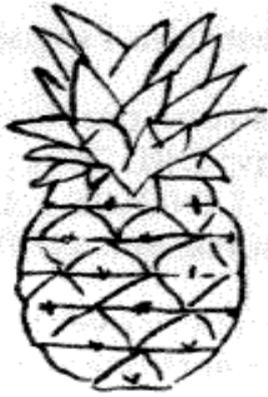








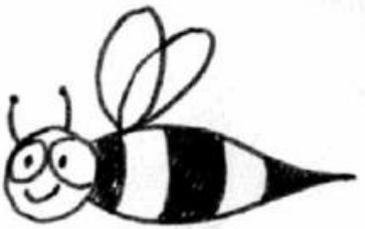
○ la parola corrispondente.



ananas

arancia

albero



ape

arte

alte



cartello

anello

agnello



amaca

armadio

anta



ala

ago

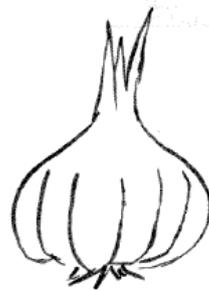
amo



asso

arancia

alce

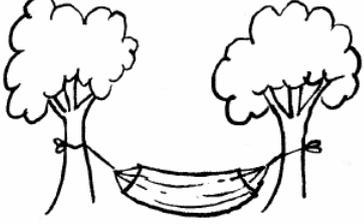
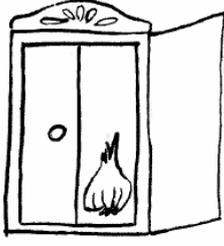
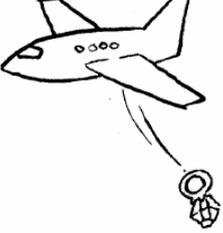
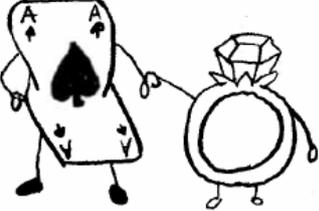


foglio

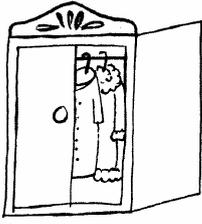
aglio

olio

Metti una "X" sulla frase giusta.

<p>L'ape vola sull'ananas. <input checked="" type="checkbox"/></p> <p>L'ape cuce l'ananas. <input type="checkbox"/></p>	
<p>L'amaca è fra gli alberi. <input type="checkbox"/></p> <p>L'alce è sull'amaca. <input type="checkbox"/></p>	
<p>L'aglio è dentro l'armadio. <input type="checkbox"/></p> <p>L'aglio è dentro l'olio. <input type="checkbox"/></p>	
<p>L'anello cade dall'aereo. <input type="checkbox"/></p> <p>L'aereo vola sull'albero. <input type="checkbox"/></p>	
<p>L'asso è fra gli ananas. <input type="checkbox"/></p> <p>L'asso è con l'anello. <input type="checkbox"/></p>	
<p>L'aereo getta l'ancora. <input type="checkbox"/></p> <p>L'ancora guarda l'aereo. <input type="checkbox"/></p>	

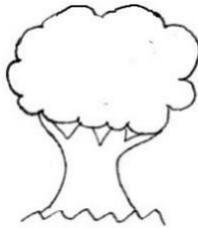
Scrivi le parole.

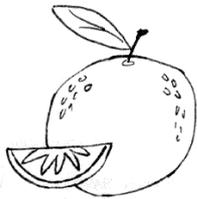








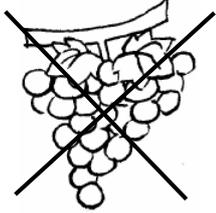
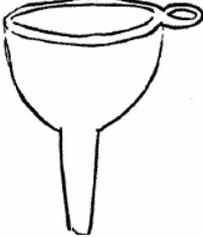
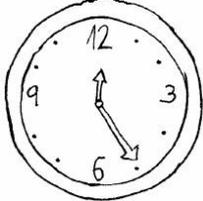
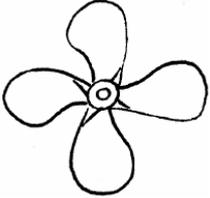
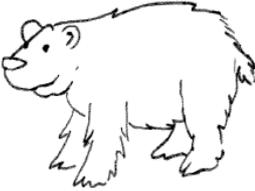






Ripasso

Trova l'immagine che inizia con il suono della lettera indicata e segnala con una "X".

u			
i			
a			
e			
o			
u			

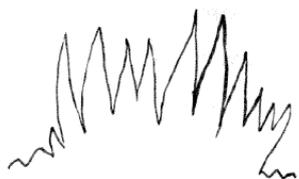
Trova la parola uguale e indicala con una "X".

elica	olio	elica	alce
uomo	uno	buono	uomo
indice	amaca	indice	edera
oca	ago	oca	ora
amico	amico	amaca	antico
uno	amo	uno	uva
otto	osso	orso	otto
indiano	imbuto	indiano	ambito
anta	ente	onda	anta
uovo	uomo	suono	amo

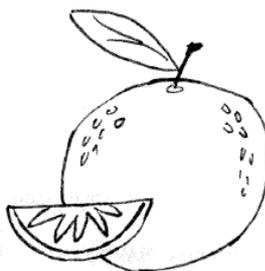
Abbina le parole con i disegni e scrivile.

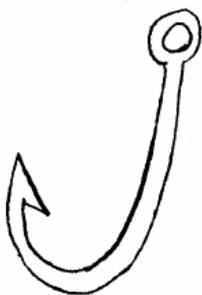
osso imbuto uovo arancia

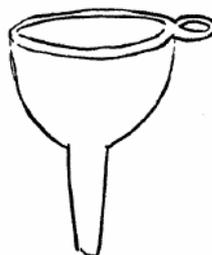
erba- onda uno amo



erba

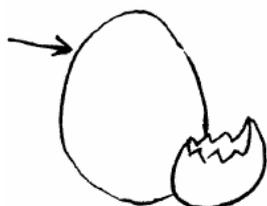






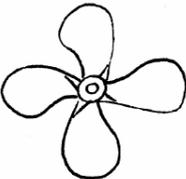








○ le lettere e componi le parole. Poi scrivi.

	a (e)	(li) ni	(ca) ce	
	a ba	de be	de te	
	di in	di gi	ce to	
	au u	di pi	do to	
	e ger	be de	ra la	
	ma an	ni co	ra sa	
	uc gu	le cel	ro lo	

Sì o no?

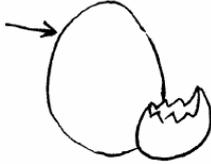
	No	Sì
L'ape gioca con il dado?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
L'udito è uno dei cinque sensi?	<input type="checkbox"/>	<input type="checkbox"/>
L'anatra mangia l'arancia?	<input type="checkbox"/>	<input type="checkbox"/>
L'aereo vola nell'aria?	<input type="checkbox"/>	<input type="checkbox"/>
L'oca cuce con l'ago?	<input type="checkbox"/>	<input type="checkbox"/>
L'alce mangia l'erba?	<input type="checkbox"/>	<input type="checkbox"/>
L'indiano ha gli occhiali?	<input type="checkbox"/>	<input type="checkbox"/>
L'indice indica l'uccellino?	<input type="checkbox"/>	<input type="checkbox"/>
L'orso usa l'asso?	<input type="checkbox"/>	<input type="checkbox"/>

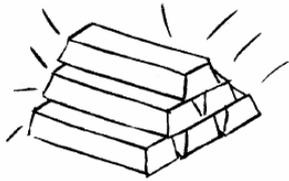
Metti una "X" sulla frase giusta.

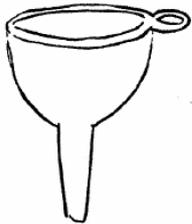
<p>L'isola è deserta. <input type="checkbox"/></p> <p>Sull'isola c'è un orso. <input checked="" type="checkbox"/></p>	
<p>L'ape è sull'abete. <input type="checkbox"/></p> <p>L'ape è sola. <input type="checkbox"/></p>	
<p>L'oca mangia l'uva. <input type="checkbox"/></p> <p>L'ago punge l'oca. <input type="checkbox"/></p>	
<p>L'uomo ha un uovo. <input type="checkbox"/></p> <p>L'uovo saluta l'uomo. <input type="checkbox"/></p>	
<p>L'albero saluta l'edera. <input type="checkbox"/></p> <p>L'albero si siede sull'erba <input type="checkbox"/></p>	
<p>L'istrice ha un'arancia <input type="checkbox"/></p> <p>L'arancia è sull'istrice. <input type="checkbox"/></p>	

Scrivi le parole.

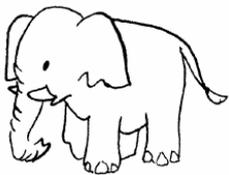


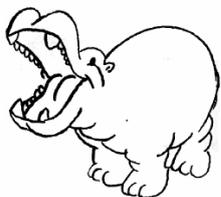






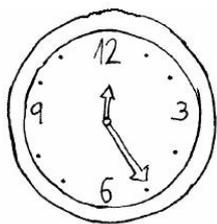






Abbina le parole con i disegni e scrivile.

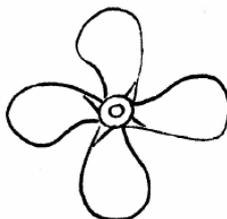
indice albero isola udito
elica uomo ~~orologio~~ ago



orologio



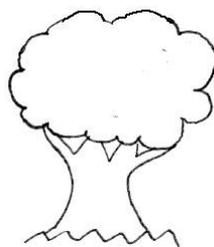




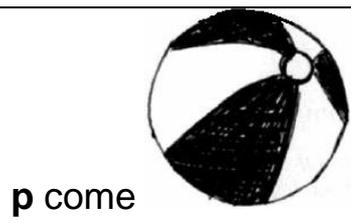
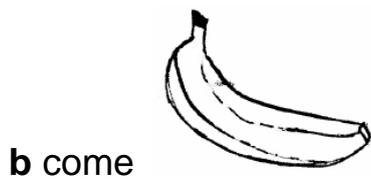




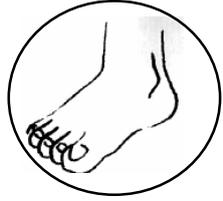
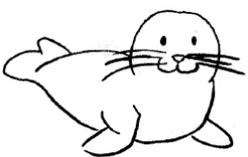
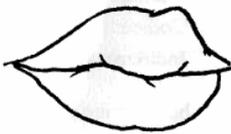
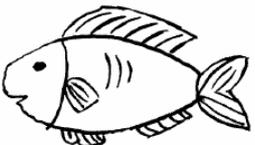
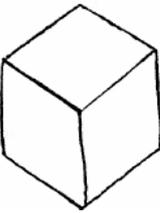




Lezione 6



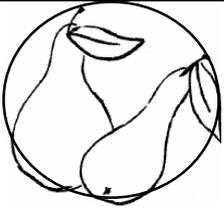
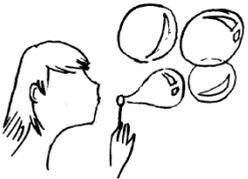
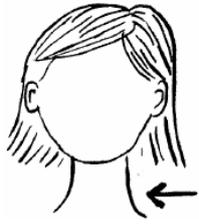
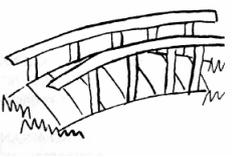
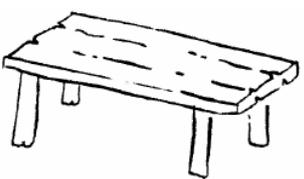
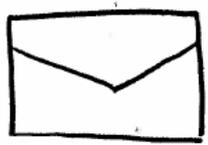
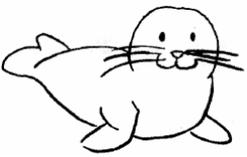
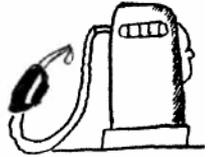
Trova l'immagine che inizia con il suono della lettera indicata e .

p			
b			
b			
p			
b			
b			

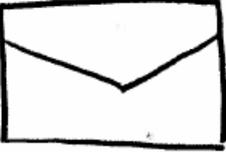
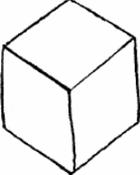
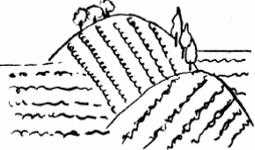
 la stessa parola.

pista	 pista	busta
basta	pasta	basta
topo	tubo	topo
buca	buca	poca
picchio	becco	picchio
bere	pere	bere
panino	panino	bacino
bollo	pollo	bollo
panda	panda	banda
benda	benda	punta

Leggi e  la parola corrispondente. Poi scrivila.

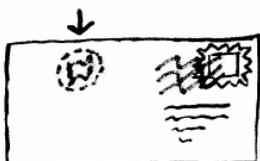
<p>pere</p> <p><u>pere</u></p>			
<p>banda</p> <p>_____</p>			
<p>pollo</p> <p>_____</p>			
<p>panca</p> <p>_____</p>			
<p>pasta</p> <p>_____</p>			
<p>buca</p> <p>_____</p>			
<p>bomba</p> <p>_____</p>			

○ le lettere e componi le parole. Poi scrivi.

	ban can	pa ca	
	ban pan	da ba	
	po bu	sta la	
	bun pom	pa da	
	cu gu	bo po	
	gam cam	pi bi	
	bi ci	co bo	

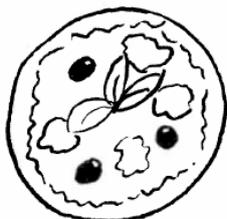
Abbina le parole con i disegni e scrivile.

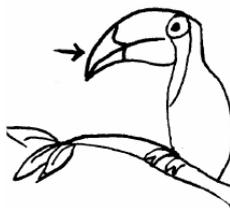
banda pizza ~~bollo~~ panca
pacco bere becco piccolo



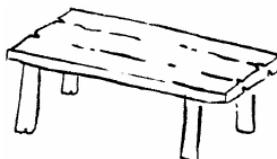
bollo







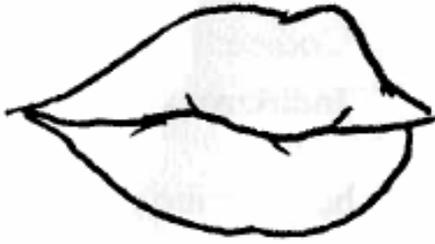








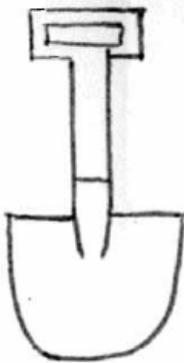
la parola corrispondente.



becco

bocca

pacco



palla

bolla

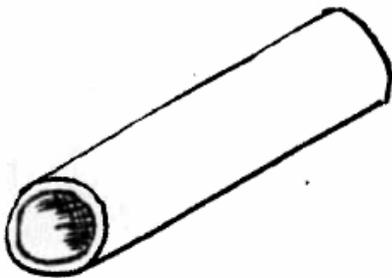
pala



piccolo

bicchiere

becco



topo

tubo

cubo



pane

pino

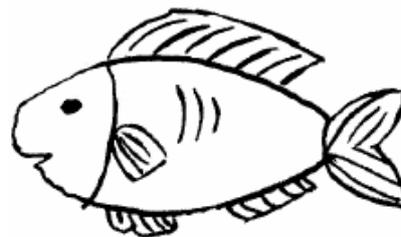
pena



panda

benda

banda

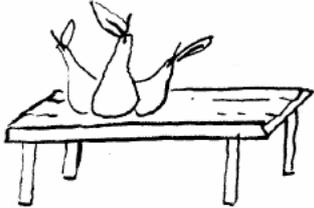


pesca

pezza

pesce

Metti una "X" sulla frase giusta.

<p>Le pere sono piccole. <input type="checkbox"/></p> <p>Le pere sono sulla panca. <input checked="" type="checkbox"/></p>	
<p>Il bicchiere è piccolo. <input type="checkbox"/></p> <p>Il bicchiere è rotto. <input type="checkbox"/></p>	
<p>Nel pacco c'è un pollo. <input type="checkbox"/></p> <p>Sul pacco c'è un bollo. <input type="checkbox"/></p>	
<p>Il panda ha una benda. <input type="checkbox"/></p> <p>Il panda ha una bomba. <input type="checkbox"/></p>	
<p>La mamma è sulla panca <input type="checkbox"/></p> <p>La mamma va in banca. <input type="checkbox"/></p>	
<p>La palla è in buca. <input type="checkbox"/></p> <p>La pala scava una buca. <input type="checkbox"/></p>	

Scrivi le parole.



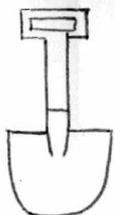






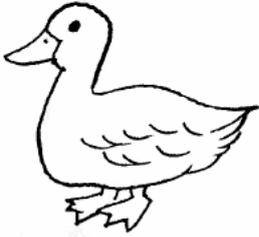
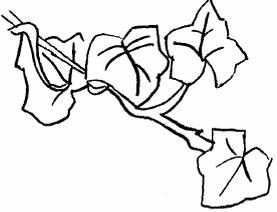
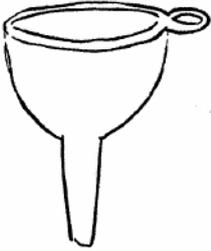
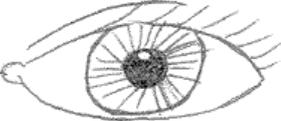
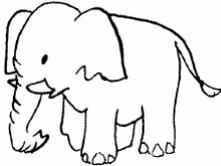
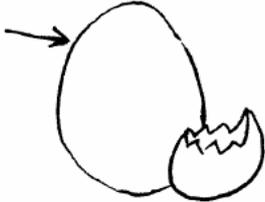
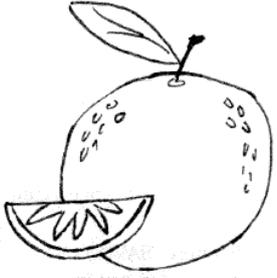
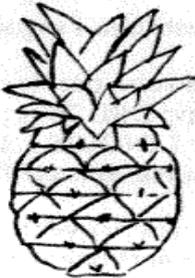
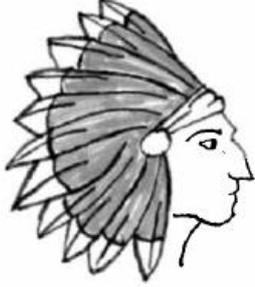




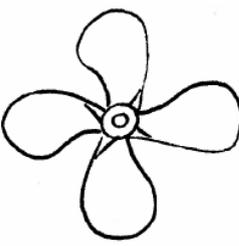
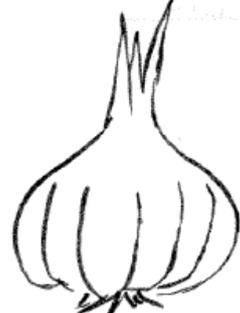
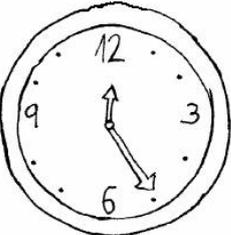
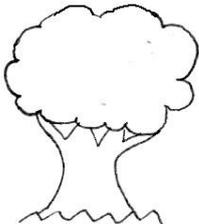


Verifiche finali

Collega l'immagine che inizia con il suono della voca indicata, poi completa la parola.

 _ ca	u	_ dera 
 _ mbuto	a	 _ cchio
 _ lefante	i	_ ccello 
 _ ovo	e	_ rancia 
 _ nanas	o	_ ndiano 

○ la parola corrispondente.

	<p>ostrica istrice ortica</p>		<p>fenicottero coleottero elicottero</p>
	<p>uomo suono buono</p>		<p>corso orso orto</p>
	<p>semina elica erica</p>		<p>olio aglio foglio</p>
	<p>orologio coraggio orario</p>		<p>mura muffa uva</p>
	<p>acero albero davvero</p>		<p>undici pendice indice</p>

la parola giusta.

bollo

1. Mi piace tanto il collo al forno.

pollo

sere

2. bere tanta acqua fa bene alla salute.

pere

panda

3. Il bambù è il cibo preferito del banda .

tenda

bue

4. Non mi piace l'uovo a occhio di due .

tue

pista

5. Mi piace tanto la casta che prepara la nonna.

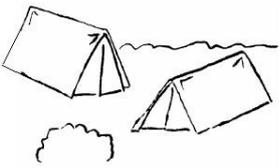
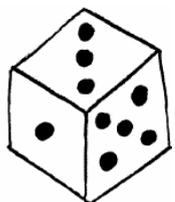
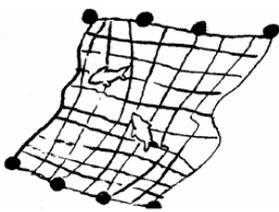
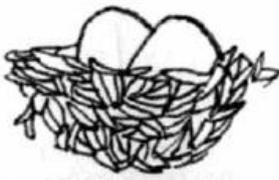
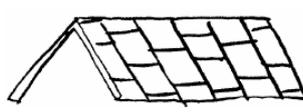
pasta

bomba

6. Per gonfiare le ruote della bici, uso la rompa .

pompa

○ le lettere e componi le parole.

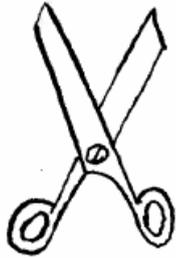
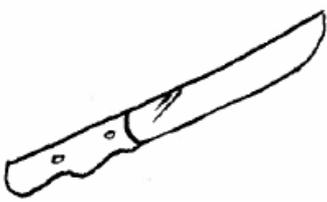
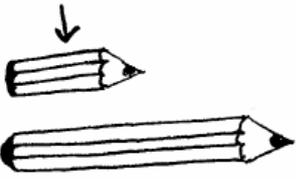
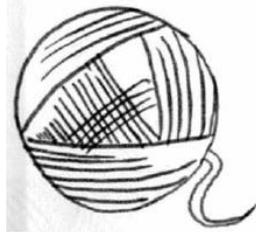
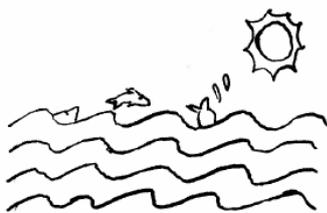
	ten den	de te	
	ta da	do bo	
	do to	po bo	
	re se	de te	
	mi ni	do to	
	ted tet	to do	
	die pie	de te	
	va fa	ta da	

Scegli la parola giusta per completare la frase.

voglia fiale voto fetta
foto vetta foglia viale

1. L'alpinista raggiunse la _____ più alta.
2. Alle feste si fanno le _____ .
3. La casa è in fondo a un _____ alberato.
4. È avanzata una _____ di pizza.
5. Ho una gran _____ di gelato al cioccolato!
6. Il mago versò la pozione in tante _____ .
7. La maestra mi ha dato un bel _____ .
9. La _____ di acero è il simbolo del Canada.

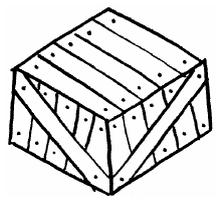
○ la parola corrispondente.

	soldi sordi		folbici forbici
	cartello coltello		colto corto
	forte folte		rana lana
	calza carta		malta Marta
	mare male		mole more

la parola giusta.

1. La scorsa estate mi sono rotto la mano destra.	mano nano sano
2. Le mie scarpe buone sono rosse.	muove nuove
3. La pergamena era legata con un mastro rosso.	pesto nastro
4. Il marinaio fa un nodo alla corda per bloccarla.	modo topo
5. Il nostro era una creatura molto triste e sola.	rostro mostro
6. Il galeone aveva le vele bianche e dei lunghi remi .	semi reni

○ le lettere e componi le parole corrispondenti.

	se ze	ro ra	
	na ma	zo so	
	zuc sug	ga ca	
	va fa	so zo	
Z	se ze	ta da	
	cas gas	ta sa	
	ta taz	za sa	
	coz ca	sa za	

5.2 Different languages, same characteristics

The same layout and language characteristics of *Explode the Code* have been maintained. Importantly, the sets of words, or pictures, comprise two or three items that are the target word, e.g. *anello*, and two other interfering ones that are, whenever possible, either grapho-phonemically, e.g. *agnello*, or semantically similar to one of the other two, e.g. *cammello*. All the illustrations have been done by me.

The contents are presented with a rule, or an example, e.g. **a** come . Then, they are followed by a task with simple and clear instructions, e.g. *Trova l'immagine che inizia con il suono della lettera indicata e . 'Find the picture that begins with the sound of the letter below and  it'.* In the lessons, the typology of exercises used are the same as in *Explode the Code*:

- sound-picture matching task, e.g. *Trova l'immagine che inizia con il suono della lettera indicata e  'Find the picture that begins with the sound of the letter below and  it';*
- word identification, e.g.  *la stessa parola* '  *the same word*';
- handwriting instructions. Importantly, this task allows students not only to practice their handwriting skills but also to test their ability to follow simple directions;
- word-and-picture matching tasks. Tasks of this type are three: *Leggi, copia e la parola corrispondente* 'Read, copy, and  it', *Abbina le parole con i disegni e scrivile* 'Match and write it', and  *la parola corrispondente* '  it'. The actions to do are the same (e.g. identify the word, match the word with the picture, and write the word) but they are combined in different ways. In the first type, students are required to write the word presented and select the right picture of the three proposed, whereas in the third type students each picture is presented with three words of which, of course, only one is the right one. Finally, in the second type, students are provided with the same number of words and pictures and have to combine them. This enhances students' ability to perform tasks actively, and not mechanically;

- word formation, e.g. ○ *le lettere e componi le parole. Poi scrivi 'Spell. Write'.* Possibly, this is the very first contact of students with the concept of syllable. However, they are not called so but 'letters', for they may be non-syllables, meaning impossible or unattested. The groups of letters chosen are phonetically related to the target one, e.g. for *abete*, *a-pa*, *be-pe*, *de-te* are presented;
- sentence-picture matching, e.g. *Metti una "X" sulla frase giusta 'X it'.* This task tests students' ability to read for meaning as opposed to interpretation on the basis of their knowledge of the world and on the cause-effect relationship. In fact, the sentences are sometimes bizarre and would not make much sense if interpreted in a reasonable way, e.g. *L'aglio è dentro l'armadio 'The garlic is in the wardrobe'.*
- spelling from memory, e.g. *Scrivi le parole 'Write it'.* The students are already familiar with the target words as they have worked on them for the entire lesson.

5.3 Materials testing

Conceiving and devising these materials is very important because as a teacher-in-training I have been able to put all the theories I have read into practice. In addition to this, I also had the opportunity to use them, meaning to submit them to some dyslexic students. Thus the working materials have been not only designed upon scientific and language hypothesis but also 'tested', although in a preliminary and informal way.

5.3.1 Participants

The participants were two dyslexic students, both aged 14;4. They were diagnosed between their second and third grade, after which only one of them was assigned a personal assistant teacher, according to the National Law 170, published October 8, 2010⁸. They did not receive proper intervention until present days.

⁸ Further information on <http://www.aiditalia.org/it/dislessia-a-scuola/legge-170-2010>.

Presently, the dyslexic students are being followed for difficulties in English literacy acquisition by Nancy Rose Steinbock, a professional clinically-certified ASHA (American Speech-Language-Hearing Association). Currently, she is in the process of having her documents certified by the Italian government, after which she will then be able to practice also in Italy and Europe as an expert in speech/language disorders and language acquisition.

Both students are now in their first year of high school. Although the language level of the materials and that of the students are very different under many points of view, I expected the students to show a lower language level than their peers, as they are dyslexic who received little and insufficient treatment and/or intervention.

The exercises have been submitted during seven sessions. The sessions have been both individual (1 hour) and of group (1.5 hours) but this was due to their personal schedules. The sessions were held once or twice a week, for four weeks. The exercises have been submitted as it follows: the consonant pre-test and the first half of lesson 1 during session 1, the second half of lesson 1 in session 2, lesson 6 during sessions 3 and 4, the review lesson during session 5, and the post-test during session 6 and 7. The decision to do some lessons in one session and some others in more than one was made on the basis of the complexity of contents and on the language level of the students.

At the beginning of each session, the content of the session was presented to the students who were, however, already familiar with some of them. Although the instructions of the tasks were simple and clear, the students knew they could stop and ask for every kind of clarification or explanation. The students were asked to complete the tasks individually both in individual and group sessions, whereas the revision was collective. In order to give students enough time to understand and reflect on the language, the tasks were completed and revised one at the time.

A general concept that I tried to convey in every session was that the learning process is not a competition, that there are no winners or losers, but only participants with their own, very personal needs and times. Mutual respect as well mutual exchange of knowledge were, conversely, very well accepted and stimulated.

5.3.2 Results

Although the students were already familiar with some of the contents, they performed better on some of them than others. For instance, they responded correctly to every item of the consonant pre-test.

The incorrect answers could be divided as it follows:

- mispronunciation mistakes: although the students selected or copied the correct word, or picture, they met significant difficulty in saying the words. Particularly, in the word-and-picture matching tasks, the students appeared to rely more on the visual clues, e.g. the picture, than on the linguistic information, e.g. the words. They were able to do the correct matches but not to say the words clearly, without errors. Most of the mistakes appeared as phonological mistakes: **anaca* in place of *amaca*, **alco* in place of *arco*, **anniello*, *agnello* (right but not correct), **aniello* in place of *anello*. **aerio* instead of *aereo* and **airia* instead of *aria*, **oga* instead of *oca*, and **anda* instead of *anta*, **tobo* instead of *topo*, **bicchio* instead of *picchio*, **pesse*, **pese* instead of *pesce*, **alio*, **allio* instead of *aglio*, **undice* instead of *indice*, *banda* instead of *panda* (right but not correct), **bompa* instead of *pompa*, **tente* for *tende*, **vata* for *fata*, *fiale* for *viale* (right but not correct);
- misunderstanding, or misinterpretation, mistakes: the students did not interpret the pictures by also using the letters, or words, given to them, so they gave incorrect answers, or no answer at all. Particularly, in the word formation tasks, they interpreted *indice* 'index' as *dito* 'finger', *edera* 'ivy' as *erba* 'grass'. Other incorrect attempts were **ugcello* instead of *uccello* 'bird', **amnico* instead of *ancora* 'anchor'. Other appropriate but not correct answers were *distributore di benzina* instead of *pompa*, *campagna* instead of *campi*. The probability task puzzled the students at the beginning because they thought the questions –

like *L'anatra mangia l'arancia?* 'Can a duck eat an orange?' – as related to some popular song, story, or movie they should have known. After explaining them that the questions were casual questions on general, probable facts, they completed the task without much difficulty. I did the same also for the sentence-picture matching task, as they only had to find the correct sentence that matched with the picture. In lesson 6, which was about the similar sounds [b] and [p], the students thought that all the words should begin with one of the two, so they answered by guessing, like *piccolo* instead of *foca*, and *premio* instead of *coppa*.

Further information that is worth sharing is that the students enjoyed particularly the sentence-picture matching tasks, so they performed quite well on the items. The students seemed to have identified the key element, that could be a noun (*Il panda ha una benda* 'The panda has a blind fold' vs. *Il panda ha una bomba* 'The panda has a bomb'), a verb (*La palla è in buca* 'The (golf) ball is in the hole' vs. *La pala scava una buca* 'The shovel digs a hole'), a preposition (*Nel pacco c'è un pollo* 'The chicken is in the box' vs. *Sul pacco c'è un bollo* 'The stamp is on the box'), or an adjective (*Il bicchiere è piccolo* 'The glass is small' vs. *Il bicchiere è rotto* 'The glass is broken'), so they did not rely on a linear interpretation of the elements of the sentence.

A crucial aspect of the exercises is that they attempted to assess not only the sounds of the lesson, but also other sounds thought to be difficult. In fact, the students also showed difficulty with certain sounds like [ɲ], [ʎ], and double consonants, in particular *ss*, *zz*, *ll*, and *rr*, which were mispronounced as [ni] and [nni], [li] and [lli], and the correspondent single consonants *s*, *z*, *l*, and *r*. This led, very often, to misinterpret and misread the word.

5.4 Discussion

This preliminary testing phase provided some fundamental information about the design and the effectiveness of the exercises.

First, the students appreciated the overall layout as compared to the textbooks they are already familiar with. They appreciated the simple but essential style which, in their opinion, allowed them to focus better on the language. They did not feel like overwhelmed by many exercises, directions, or misleading pictures or photos. Although the typology of the exercises was different from what they are used to, they enjoyed it, especially for the large space left to write the words properly and clearly.

Second, the students appreciated the immediate directions as well as the simple language. In their opinion, the lack of passive structures and of the formal register combined with the presence of examples helped students complete the tasks. Although the objective of some exercises was to assess their competence and production of certain sounds indirectly, they did not think of this as enormously difficult but rather as positively challenging.

Third, some incorrect answers were due to an incorrect interpretation of the pictures, as they pointed out during the revisions. However, when the picture was explained not as itself in isolation but as in relation to the letters, or words, they immediately understood the connection and where their error was. It seemed as the students relied more on their background knowledge, and not on the linguistic information there provided.

The results provided by this preliminary and informal testing phase are generally positive and encouraging. However, some critical aspects have been identified, like the ambiguous picture, or the tendency of the students to interpret the items on the basis of their background and world knowledge, and not with the linguistic information provided.

Further research should focus on exploring the strategies that challenged learners use in order to overcome learning issues.

Finally, and most importantly, this testing was conducted in an informal way and on a small group of participants. My hope for the future is to be able to have more time to design the exercises and to analyse and interpret all of the answers, as well as to have larger, statistically significant samples of participants, both challenged and non-challenged. Since the working materials have been thought

for learners of Italian language, to have them tested on both typical and atypical students would provide information that is more complete and, in the long term, would inform always better and more effective materials.

6. Conclusions

An important purpose of my thesis was to demonstrate the scientific need to study dyslexia and language disorders, with meaningful and valid research that investigate the various components. With regard to dyslexia, several important though different hypotheses – and approaches – have been proposed through years to understand and explain it. Among the others, some hypotheses take it to be a linguistic disorder (Vellutino and Scanlon, 1994; Ziegler and Goswami, 2005; Cardinaletti et al., 2014).

With regard to English, the disorder is mainly conceived as a phonological deficit that would prevent dyslexic individuals from establishing a strong sound-letter, e.g. grapheme-phoneme relationship. In this phonological perspective, best predictors of the disorder are word and pseudoword identification (Perfetti, 1985), spelling ability, phoneme awareness, and verbal memory (Vellutino et al., 1994). As far as the Italian language is concerned, dyslexia has mostly been described as a visual ability deficit. Thus, the difficulty in reading and writing would produce letters and syllables inversion or confusion (Stella and Grandi, 2011; Dettori, 2015) which, in turn, affect reading accuracy (Marinelli et al., 2014) as well as reading speed rate (Tressoldi et al. 2001) and text comprehension (Dettori, 2015). However, as Shankweiler (1989) explains, there are many possible connections between problems with sentence understanding and those with word decoding. Thus, general problems of comprehension could be caused by a deficit in the phonological processes.

The different approaches adopted for English and Italian languages have always been explained in terms of different transparency of the orthography, a factor that would have a significant role in the manifestation of the disorder (Paulesu et al., 2001). In fact, recent research observes that English and Italian adopt different orthographic systems, with the first being dense and the second transparent (Seymour et al., 2003). Consequently, early learners of languages with transparent orthographies like Spanish, German, and Italian would be more

flexible in establishing the connection between letters and sounds than those who begin languages with dense orthographies, like French and English (Marinelli et al., 2013).

However, a comprehensive comparison of the English and Italian grapho-phonemic systems showed some interesting aspects. Italian orthography appeared as less transparent as has been thought. In fact, the consonant system is more complex than the vowel system (Graffi and Scalise, 2013). Conversely, the English vowel system is more complex and sophisticated than the Italian one, whereas the consonant system appears as small and consistent (Moats, 2010).

In order to design and realize original Italian working and teaching materials, what has been taken into consideration is previous research on dyslexia disorder, the phonological and orthographical aspects found in the comparison between English and Italian as well as the language and layout peculiarities of the English language phonics program *Explode the Code*. The materials, designed on specific linguistic hypothesis, exemplify a different approach to Italian language, with an important focus on its phonology in relation to its orthography. The contents are arranged and proposed from the smallest and simplest, e.g. sounds and letters, to the largest and most complex, e.g. diphthongs, consonant clusters, and digraphs, syllables, morphology, and lexicon. The increasing difficulty of the content is appropriate to the linguistic level of each student. Consequently, in the course of the coming years, it could be possible to investigate certain grammar and/or syntactic structures or chunks of language.

Particularly, handwriting instruction is still important in early education and, crucially, in remediation. Although today most people rely on other ways to write, e.g. electronic devices such as computers, cell phones, tablets, etc., clear and legible handwriting is still a fundamental component for communication and for providing an important multisensory pathway to develop certain abilities associated with learning. In fact, research (Berninger and Richards, 2002) shows the role played by handwriting in the development of the orthographic skills

needed for reading, e.g. handwriting, spelling, and composition. Handwriting instruction has been shown to be useful and beneficial to every student, be they challenged, e.g. dyslexic or dysgraphic, or non-challenged.

Most importantly, a preliminary trial with the materials to a small group of dyslexic students, has provided some interesting results. In this trial phase, key aspects of design were noted to be important. These included the clear and simple layout, the immediate and direct instructions, and the new, different typology of the exercises. While initial results demonstrated the need to redesign exercise and reconsider how to present them to avoid misunderstanding of their purpose, the outcome was generally found to be positive and encourages future development and testing.

Specific instruments for specific disorders

Although linguistic difficulties sometimes appear as insufficient to diagnose a specific learning disorder, also in subjects who have a genetic component as well (Catts and Kahmi, 2005), the linguistic areas targeted by these materials, e.g. phonology, orthography, lexicon, syntax, and (text) comprehension, are the same that research has indicated as particularly difficult (Brady et al., 1983; Mann et al., 1984; Stein et al., 1984; Elbro, 1997, Manis et al., 1997; Manis et al., 2000; Ramus et al., 2003; Snowling et al., 2003;). In spite of this, standardized tests (see Introduction) provide a general evaluation of the language competence, and not also specific assessments of each linguistic aspect. Recent research (Friedmann and Novogrodsky, 2008) emphasized the need for specific instruments to assess different language modules, such as phonology, lexicon, syntax, and pragmatics. Indeed, a general evaluation of the language competence could not be enough in order to identify the linguistic difficulties of dyslexic subjects.

The importance of a cross-linguistic approach today

The ultimate scope of my thesis work is to propose markers of dyslexia in Italian, which I have proposed as the contents of the three volumes. Having been

designed after an English language phonics program, a secondary aim of these teaching materials is to confirm the crucial advantages of a cross-linguistic approach which is fundamental and compelling in our 'multi-society' (Scortichini et al., 2014). Such an approach would tackle the problem from a comparative language perspective (Cardinaletti, 2014) in order to understand whether students' problems are due to a learning disorder, be it dyslexia or specific language impairment, or to general language challenges with the second or foreign language (Scortichini et al., 2014). Were it the case of a learning disorder, students would need immediate speech-language intervention and re-education, whereas in the second case students would be part of an intense educational, thus language program (Scortichini et al., 2014). Importantly, this would minimize the risk that, only in the hands of well-prepared teachers who understand theory and practice, students could be left behind academically in the presence of both challenges.

Future research proposal

Further research should investigate the defining aspects and peculiarities in relation to each language. This would provide better and more detailed information on the typology of errors and on the linguistic and non-linguistic strategies dyslexics adopt with regard to their own languages (Treiman 1997; Bourassa and Treiman 2001; Abu-Rabia and Taha, 2004; Ziegler et al., 2005; Ashum and Gulgoona, 2006; Protopapas et al., 2012; Bigozzi et al., 2014; Rello et al., 2014).

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Explode the Code - Volume 1

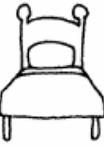
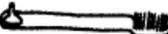
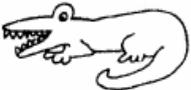
Lesson 1

Lesson 1

a says /ă/ as in 

Find the picture that begins with the sound of the letter below.

it.

ă			
ă	$\begin{array}{r} 2 \\ + 2 \\ \hline 4 \end{array}$		
ă			
ă			
ă			
ă			

1

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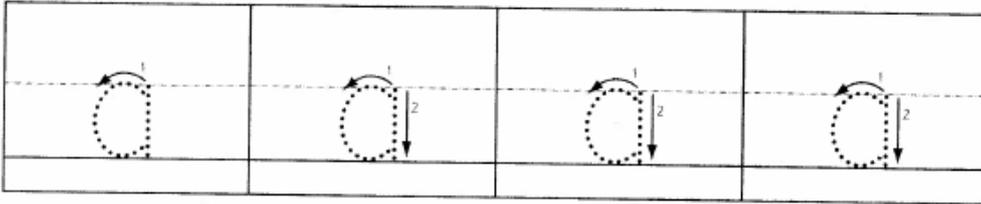
the same word.

bat	hat	<input checked="" type="radio"/> bat
fat	hat	fat
mat	mat	nat
pat	bat	pat
rat	rap	rat
cat	cot	cat
sat	sat	sap

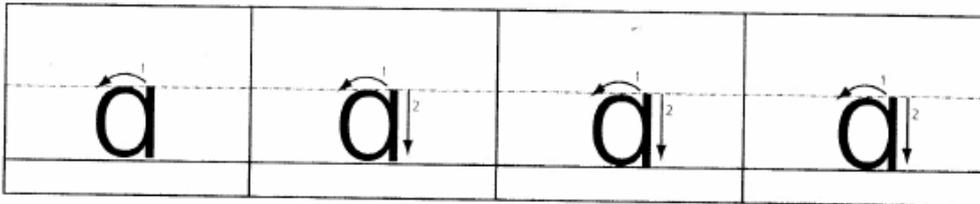
2

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Follow the arrows to write the letter **a**, which says /ă/ as in  .
 Say the sound aloud. Notice that **a** begins like the letter **c**.



Notice that **a** is only one space tall. Trace the letters.

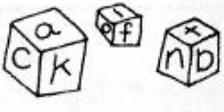
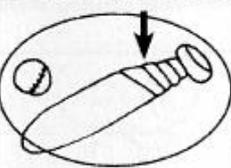
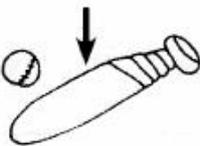
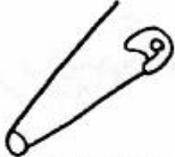
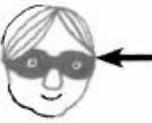


Trace and copy the letter that begins the pictured word.

	a		
	a		
	a		
	a		

3

Read, copy, and ○ it.

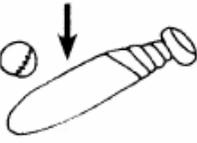
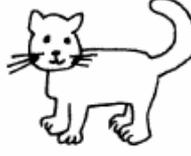
bat b a t			
hat _ _ _			
sat _ _ _			
rat _ _ _			
Nat _ _ _			
bat _ _ _			
mat _ _ _			

4

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Spell.

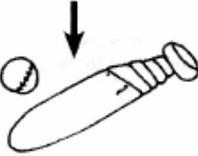
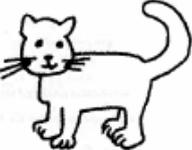
Write.

	(b)	g	(a)	n	f	(t)	bat
	s	r	n	a	t	m	
	h	b	o	a	t	p	
	g	p	a	x	t	d	
	w	m	i	a	k	t	
	c	d	m	a	t	h	
	p	b	a	r	t	d	

5

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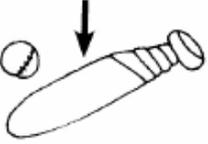
Match and write it.

hat	bat	mat	bat
pat	rat	sat	cat
 bat		_____	_____
	_____		_____
	_____		_____
	_____		_____

6

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○ it.

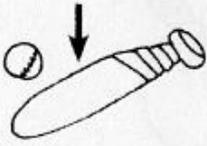
		bad fat bat	
	rat ran tar		can cat cab
	nap tan Nat		man tam mat
	pat bat pad		cat sad sat

X it.

The hat is fat. The bat is fat.	<input type="checkbox"/> <input checked="" type="checkbox"/>	
Pat sat on a cat. Pat sat on a mat.	<input type="checkbox"/> <input type="checkbox"/>	
A cat is at bat. A rat is at bat.	<input type="checkbox"/> <input type="checkbox"/>	
The cat is on a mat. The rat is on a cat.	<input type="checkbox"/> <input type="checkbox"/>	
Nat sat at bat. Nat sat on a rat.	<input type="checkbox"/> <input type="checkbox"/>	
A fat bat is on a cat. A fat cat is on a hat.	<input type="checkbox"/> <input type="checkbox"/>	
The rat sat. The bat sat.	<input type="checkbox"/> <input type="checkbox"/>	

8

Write it.

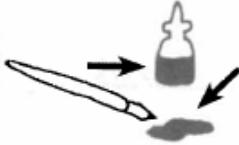
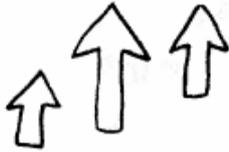
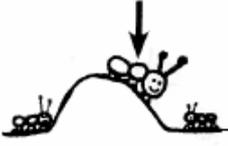
	bat
	
	
	
	
	
	

Lesson 11 - Review Lesson

Lesson 11 • Review Lesson

Find the picture that begins with the sound of each letter below.

it.

ē	$\begin{array}{r} 2 \\ + 2 \\ \hline 4 \end{array}$		
ō			
ă			
ī			
ū			
ē			

85

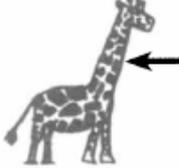
○ the same word.

rat	cat	rat	rag
pop	pep	pop	pup
pack	pick	pack	peck
led	lid	led	lad
sick	sack	sick	sock
rock	rock	rack	mock
luck	lock	tuck	luck

86

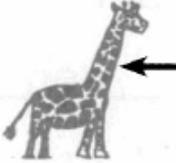
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Match and write it.

bib rat duck kick	
well lock neck doll	
 <u> </u> <u>rat</u> <u> </u>	 <u> </u> <u> </u> <u> </u>
 <u> </u> <u> </u> <u> </u>	 <u> </u> <u> </u> <u> </u>
 <u> </u> <u> </u> <u> </u>	 <u> </u> <u> </u> <u> </u>
 <u> </u> <u> </u> <u> </u>	 <u> </u> <u> </u> <u> </u>

Spell.

Write.

	c	r	a	o	f	t	rat
	n	m	e	i	b	ck	
	m	w	e	i	ck	ll	
	t	k	i	e	ck	ss	
	l	t	a	o	z	ck	
	b	d	o	u	ck	g	
	d	b	e	o	ll	ck	

88

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Yes or no?

	Yes	No
Can Jim sip pop?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Can a doll run?	<input type="checkbox"/>	<input type="checkbox"/>
Will Jill sit on a rat?	<input type="checkbox"/>	<input type="checkbox"/>
Can a duck get a wig?	<input type="checkbox"/>	<input type="checkbox"/>
Can a well kick?	<input type="checkbox"/>	<input type="checkbox"/>
Will a hat fit Jeff?	<input type="checkbox"/>	<input type="checkbox"/>
Will a big tub hop?	<input type="checkbox"/>	<input type="checkbox"/>

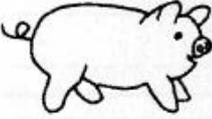
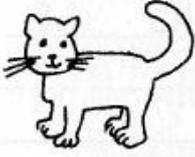
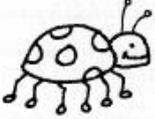
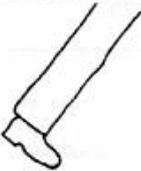
89

X it.

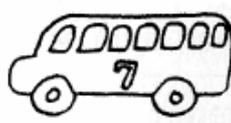
<p>It is a big lock.</p> <p>Dot has a red sock.</p>	<input checked="" type="checkbox"/> <input type="checkbox"/>	
<p>The pig led Jim to the box.</p> <p>The pig locks Jim in the bus.</p>	<input type="checkbox"/> <input type="checkbox"/>	
<p>The men sell a hen in a pen.</p> <p>The duck met a cat at the well.</p>	<input type="checkbox"/> <input type="checkbox"/>	
<p>Pat fell and hit his leg.</p> <p>Pam kicks a can on the hill.</p>	<input type="checkbox"/> <input type="checkbox"/>	
<p>Jill sits on a wet duck.</p> <p>Jeff has a wet bug on his back.</p>	<input type="checkbox"/> <input type="checkbox"/>	
<p>The mutt has a bell on its neck.</p> <p>The mutt met a duck on a log.</p>	<input type="checkbox"/> <input type="checkbox"/>	
<p>Bill will lock the dog pen.</p> <p>Bill kicks the bag of rags.</p>	<input type="checkbox"/> <input type="checkbox"/>	

90

Write it.

	rat
	
	
	
	
	
	

Write it.

	<hr/> <hr/> <hr/>
	<hr/> <hr/> <hr/>
	<hr/> <hr/> <hr/>
	<hr/> <hr/> <hr/>
	<hr/> <hr/> <hr/>
	<hr/> <hr/> <hr/>
	<hr/> <hr/> <hr/>

Explode the Code - Volume 4

Lesson 1

Lesson 1

RULE: Sometimes 2 little words are put together to make 1 word. The new word is called a compound word.

wind + mill = windmill



Draw a line between the 2 little words in each compound word below.

inside	catfish
hillside	sunset
homesick	pancake
maybe	bedtime
upset	himself

1

RULE: 2 little words put together make a compound word.

wind + mill = windmill



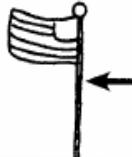
the compound word that matches the picture.

 <p>sandwich <input checked="" type="radio"/> sandbox sandbag</p>	 <p>wishbone windmill whiplash</p>
 <p>cake pan cupcake pancake</p>	 <p>handstand handshake handbag</p>
 <p>catfish classmate campfire</p>	 <p>sailfish sailboat sunshine</p>
 <p>bathtub bathrobe backrub</p>	 <p>homerun hatbox homesick</p>

2

Spell.

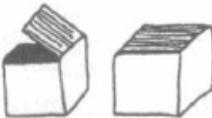
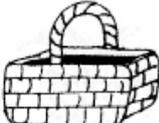
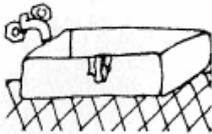
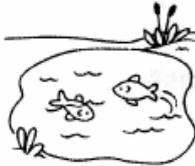
Write.

	mend (wind) will (mill)		windmill
	pump drum stuck stick		_____
	sun fun set seat		_____
	cut cup kick cake		_____
	pin flag pole hole		_____
	dish dash pan pin		_____
	bass base hall ball		_____

3

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Read, write, and ○ it.

<p>pancake</p> <p><u>pancake</u></p>			
<p>pigpen</p> <hr/>			
<p>bathtub</p> <hr/>			
<p>anthill</p> <hr/>			
<p>lampshade</p> <hr/>			
<p>sandbox</p> <hr/>			
<p>fishpond</p> <hr/>			

4

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Yes or no?

	Yes	No
Can you catch a windmill?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Will a wishbone bring luck?	<input type="checkbox"/>	<input type="checkbox"/>
Can you sit on a flagpole?	<input type="checkbox"/>	<input type="checkbox"/>
Will a rosebud smell sweet?	<input type="checkbox"/>	<input type="checkbox"/>
Will a classmate sleep in a pigpen?	<input type="checkbox"/>	<input type="checkbox"/>
Are you upset if you are homesick?	<input type="checkbox"/>	<input type="checkbox"/>
Can you bake homemade cupcakes?	<input type="checkbox"/>	<input type="checkbox"/>

5

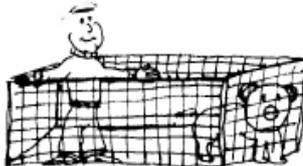
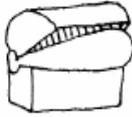
Pick a word to fit each sentence.

skyline	fishbone	baseball
fishpond	sunshine	flagpole
bedtime	bathtub	campfire
Let's play a game of <u>baseball</u> .		
It's fun to sit by the _____.		
You raise the flag on the _____.		
The _____ melts the snow.		
Put the plug and the soap in the _____.		
At the end of the day it is _____.		
See if you can catch a fish in the _____.		

6

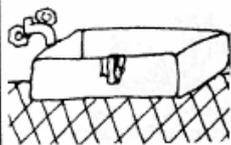
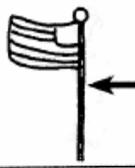
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X it.

<p>Dave is inside the pigpen. <input checked="" type="checkbox"/></p> <p>Dave is inside the sandbox. <input type="checkbox"/></p>	
<p>Hank is glad to sit on the cupcake. <input type="checkbox"/></p> <p>Hank is safe inside his playpen. <input type="checkbox"/></p>	
<p>The baseball bat will not fit in the lunchbox. <input type="checkbox"/></p> <p>She digs in the sandbox with a drumstick. <input type="checkbox"/></p>	
<p>Gus sails in the bathtub at sunset. <input type="checkbox"/></p> <p>Gus drops his handbag in the fishpond. <input type="checkbox"/></p>	
<p>The cupcakes on the sailboat are homemade. <input type="checkbox"/></p> <p>The flat pancakes are in the hatbox. <input type="checkbox"/></p>	
<p>The big wishbone is on the lampshade. <input type="checkbox"/></p> <p>The fishbone is stuck in the windmill. <input type="checkbox"/></p>	
<p>The tomcat hunts in the trashcans. <input type="checkbox"/></p> <p>The tomcat jumps into the dishpan. <input type="checkbox"/></p>	

7

Write it.

	<u>sunshine</u>
	_____
	_____
	_____
	_____
	_____
	_____

8

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Lesson 5 - Review Lesson

Lesson 5 • Review Lesson

Words can be divided into syllables:

1. between 2 little words — **wind/mill**
2. between a word and its ending — **jump/ing**
3. between 2 consonants that are the same — **rab/bit**
4. between 2 consonants that come between 2 vowels — vc/cv — **nap/kin**

Draw a line between the syllables in each word below.

collect	invite
plastic	splendid
hopeful	hello
admit	backpack
gossip	index

33

To help read these words, think of the rules to divide words into syllables.

the word that matches the picture.

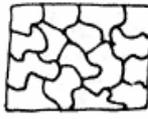
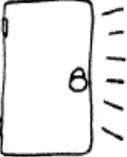
 <p>invite unlock unsafe</p>	 <p>public puppet pumpkin</p>
 <p>slapstick stamped slanted</p>	 <p>swinging slippers singing</p>
 <p>chipmunk chopstick chicken</p>	 <p>whisking whisper whisker</p>
 <p>master monster mitten</p>	 <p>member number monster</p>

Spell.

Write.

	san sun	shin shine	_____
	kiss sick	ing ang	_____
	lip lap	stack stick	_____
	mit met	ten net	_____
	swing sing	ing ong	_____
	wish whis	kers ken	_____
	slip ship	pen per	_____

Read, write, and ○ it.

puppet _____			
hammock _____			
singing _____			
handshake _____			
chipmunk _____			
hanging _____			
slanted _____			

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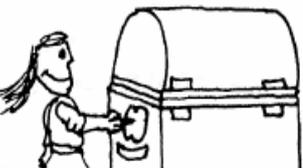
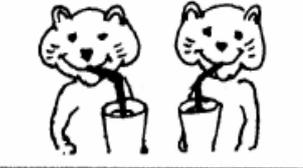
Yes or no?

	Yes	No
Can he play with puppets by himself?	<input type="checkbox"/>	<input type="checkbox"/>
Can you play the trumpet with lipstick on?	<input type="checkbox"/>	<input type="checkbox"/>
Will a chipmunk shave his whiskers?	<input type="checkbox"/>	<input type="checkbox"/>
Is singing fun for chipmunks?	<input type="checkbox"/>	<input type="checkbox"/>
Will a gumdrop be made of plastic?	<input type="checkbox"/>	<input type="checkbox"/>
Is it a mistake to kiss a monster?	<input type="checkbox"/>	<input type="checkbox"/>
Do hands go inside slippers and feet in mittens?	<input type="checkbox"/>	<input type="checkbox"/>

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X it.

Chip is running on a splendid day. <input type="checkbox"/>	
Chip is swinging on a swing. <input type="checkbox"/>	
The monster rests in the hammock. <input type="checkbox"/>	
The monster is rushing to the hilltop. <input type="checkbox"/>	
A man with whiskers collects trash. <input type="checkbox"/>	
The firetruck whips into the driveway. <input type="checkbox"/>	
Joan unlocks the biggest chest. <input type="checkbox"/>	
Joan unpacks the cheese and crackers. <input type="checkbox"/>	
The chipmunks are wishing for summer. <input type="checkbox"/>	
The chipmunks are sipping the eggnog. <input type="checkbox"/>	
The puppets are swinging by strings. <input type="checkbox"/>	
The pup has a leash made of the thinnest string. <input type="checkbox"/>	
We are swimming in rubber tires. <input type="checkbox"/>	
The slippers are hanging beside the fire. <input type="checkbox"/>	

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Write it.

	<hr/>
	<hr/>
	<hr/>
	<hr/>
	<hr/>
	<hr/>
	<hr/>

Table of content of Italian working materials

Preschool volume

Graphomotor exercises

Color the thin space of notebook lines

Color the large space of notebook lines

Completion and expansion of spaces with lines, with different hands (bottom-up or top-down lines; backward, forward, and crossed dashes; normal, thin, or thick hands)

Color black and white picture staying in the borders

Completion and expansion of incomplete pictures

Completion and expansion of incomplete abstract images – with continuous or interrupted lines, in different directions; observation of colors and shapes, and creation of new elements

Space orientation exercises

Dictation of paths

Orthography and handwriting instruction exercises

Animal alphabet and numbers to colour and copy following the instructions with dots and lines

Volume 2

Lesson 1

ca, co, cu and *cia, cio, ciu*

Lesson 2

ce and *ci, che* and *ghi*

Lesson 3

ga, go, go, and *gia, gio, giu*

Lesson 4

ge and *gi, ghe* and *ghi*

Orthographic rule: the plural of *cia* and *gia*

Review lesson

Lesson 5

The digraph *gli*

Lesson 6

The digraph *gn*

Review Lesson

Lesson 7

Discrimination of the digraph *sc*

Review Lesson

Lesson 8

cu and *qu*

Lesson 9

cu, qu, and *cqu*

Review Lesson – lexical development

Relationship between words

Post-test

Volume 3

Lesson 1

Two-syllable and three-syllable words (patterns CV, VC, CVC, CCV)

Lesson 2

Syllable patterns CVC/CV and CV/CCV

Review Lesson

Lesson 3

Syllable division with *r, l, s*

Lesson 4

Double consonants – discrimination

Lesson 5 – lexical development

Single consonants vs. double consonants

Review lesson

Lesson 6

mb and *mp*

Lesson 7

nd and *nt*

Review Lesson

Lesson 8

Division of double consonants

Lesson 9 – lexical development

Different double consonants

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Lesson 10

Words with a syllable in common

Lesson 11 – lexical development

Derived words

Review lesson

Post-test

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