

Analysis of difficulties in understanding and applying the alphabetic principle

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Abstract

The aim of this study is to analyze general, conceptual problem issues in explaining specific learning disabilities in written language. Though some authors feel that a certain degree of consensus has been reached, in some specific issues there continue to be severe discrepancies about the conceptualization of learning disabilities in learning to read and in the reading process itself. An ongoing climate of controversy is foreseen, which can only be ended or alleviated by research and critical reflection. The basic issue, drawn from the current dyslexia panorama, is not only explanatory, but extends logically to the procedures used to evaluate the seriousness of the problem and to help students with learning disabilities to encourage internalization of written language as a psychological instrument.

Keywords: dyslexia, alphabetic principle, phonological knowledge, written language

Introduction

The controversy around explaining specific difficulties in the process of learning to read and write (RW) has a long tradition, and it has followed a parallel process to the controversy generated around Learning Disabilities (LD). This conceptual issue can be articulated in terms of two general perspectives: the *neuropsychological* and the *defectological* or *sociocultural* (Escoriza, 1998ab, 2002). Adopting one or another framework as one's reference has decisive implications both for one's interpretation of dyslexia as well as for formulating criteria for its evaluation and educational treatment (Escoriza, 1998ab, Escoriza & Boj, 1998) (see table 1). The supposed involvement of neurological dysfunctions in one's explanation of dyslexia gives rise to the formulation of several lines of research which understand dyslexia as a diagnosable manifestation of delays in the learning of written language due to the existence of certain dysfunctions of an organic nature, identified in any of the following systems: hemispherical, cerebellar, magnocellular and/or genetic (Olson, 2002; Nicolson & Fawcett, 1999; Knight & Hynd., 2002; Eckert & Leonard, 2000; Frith, 1999, 2002; Pugh et al., 2000; Stein, 2001, among others). This point of departure, proceeding from the medical model, would be followed by explanations from those who defend the basic cognitive processes model (Escoriza, 1998b).

The neuropsychological tradition is founded on a series of explanatory principles which have had considerable influence on interpreting specific disabilities in learning written language, having been defined over time:

a. Development as an internal process: quantitative increase in organic and/or psychological functions whose normal development enable the learning of written language; consequently, the appearance of any kind of dysfunction will be understood as the cause of dyslexia. Such dysfunctions constitute internal obstacles which limit or hinder performance, and therefore explain the discrepancy that can occur between IQ and the learning of RW. According to Frith (1999), dysfunction, deficit and anomaly are all terms referring to the disorder of a normative function, thus causing difficulties in learning to read and write. Frith (1999, 2002) holds that an obvious consensus is emerging where dyslexia is a neurological disorder with a biological origin which influences the processing of language, and which has a wide range of clinical manifestations. This author (1999, pp. 197-198) proposes the use of the term dyslexia only when referring to a neuro-developmental disorder and not for referring to reading problems. According to the causal chain which Frith formulates, if a dysfunction exists at a neurological level, in a specific system in the brain, a dysfunction will be produced in the cognitive processes which are based on that system, and these would be the causes of dyslexia. This whole series of causes, both distal (neurological dysfunctions) and proximal (cognitive deficits), will have a clear, evident behavioral manifestation: difficulty in learning to read. The applied criterion for identifying a person as dyslexic is the criterion of significant discrepancy.

b. In order to specify what type of populations can be considered non-dyslexic, one applies the exclusion criterion. Application of this criterion typically has two general versions. One of them is found in nearly all definitions of LD, and the second is found in Frith's proposal (Frith, 1999, 2002): the term dyslexic is reserved for only those persons who present reading problems due to a neurological dysfunction and not for referring to reading difficulties due to other kinds of possible causes.

c. In order to evaluate the effects of the disability, psychometric procedures are usually used: quantitative measurement of aptitudes or psychological functions. According to Kozulin (2000, p. 88), evaluation according the psychometric paradigm shows the following characteristics: performance level made evident, the child's internal aptitudes more or less accurately revealed, and unaided execution. This is the best format for performing the

evaluation; the objective of the tests is to predict future performance and to classify the child according to his or her aptitude level.

Cole and Griffin (1989, p. 89) formulated the following assessment of the epistemological tradition which we are analyzing: *‘The acquisition of reading in our societies poses numerous problems, traditionally assigned to the individual as the carrier of specific deficits which lie at the root of any difficulties experienced when facing a written text’*. From Cole and Griffin’s general commentary we can highlight three conceptual elements: (1) the existence of an epistemological tradition focused on attributing learning disabilities in reading and writing to internal deficits (intrinsic criterion), (2) consideration of learning written language as a developmental process, that is, a process where a gradual internalization of the literacy competency is being produced, and (3) the need for a sequence of different mediating systems to intervene in this process as a function of identified educational needs.

On the other hand, the sociocultural perspective proposes a radically different explanatory framework from what we have seen in the neuropsychological tradition:

a. The process of developmental/educational change is understood as an interaction between the natural and cultural lines of development, and learning disabilities are attributed to sociocultural factors, since, according to Kozulin (2000), the principle which constructs higher level psychological functions is found outside the individual: in *psychological instruments* and in *interpersonal relationships*.

b. Disability does not have a *limiting* effect on development, but it may generate a *different* development (Gindis, 1995). What induces modifications is the sociocultural environment, not the organic dysfunction in itself (2000, p. 48); the child, in order to experience adequate concept formation, should participate in specially designed learning activities which offer a framework for guided construction.

c. Dynamic evaluation is considered to be the most suitable procedure for analyzing the learning process, since specific changes in cognitive functioning take place while this process is underway, and are due to the educational assistance which is being provided. From the sociocultural perspective, the purpose of evaluation is not to obtain quantitative information about what the disabled student has learned, but rather to find out the student’s learning potential in a joint collaborative activity. According to Kozulin (2000, p. 87), Vygotski (1986) held that *“the evaluation task should not only identify the child’s cognitive*

processes which are fully developed, but also those which are under development at the time of the evaluation. This development depends on a cooperative interaction between the child and the adult who represents the culture and who helps him or her acquire the symbolic instruments necessary for learning". In Kozulin's opinion (2000, pp. 88-89), dynamic evaluation presents the following singularities: (1) cognitive processes are very modifiable, and thus the task of evaluating consists of determining the degree of modifiability instead of the level of performance shown, (2) interactive evaluation, which includes the learning phase, provides a better understanding of the child's capacity for learning than does unaided execution, and (3) the objective of evaluation is to reveal the child's learning potential and to propose psychopedagogical interventions which aim to stimulate and realize that potential.

d. Educational intervention which is mediatized and compensatory (Escoriza, 1998b): internalization of sociocultural instruments in joint collaborative activities. According to Kozulin (2000, p. 184), *"A single function (for example, memory or attention) takes on two completely different forms if it is perceived as an individual trait or if it is perceived as the result of culturally symbolic processes which the individual appropriates, and which are, in a certain sense, supraindividual. Consequently, Educational or School Psychology takes interest not so much in identifying individual students' aptitudes and tendencies as in focusing on socially constructed activities which allow for developing the students' learning potential and higher psychological functions"*. The internalization of psychological instruments is therefore configured as the principal characteristic of teaching-learning processes. Just as with persons who have no disability, the concept of internalization of psychological instruments in the context of joint collaborative activities with more skilled persons is considered to be the principal mechanism for promoting development in the case of persons which some organic and/or psychological dysfunction.

e. The disability is interpreted as a process during which qualitative modifications or changes in cognitive functioning are being produced. Errors are considered essential to the process of learning to read, in the sense that they inform us as to how the process is developing. Thus, they should be interpreted as transitory states and not as permanent states resulting from a more or less serious deficit. As for evaluation of errors, they should be identified in the process of written text comprehension.

| LD Perspective | LD Model | Hypothesis | Conceptualization of Reading | Manifestation |
|------------------------------|---|--|---|---|
| Neuropsychological | Medical: <i>Organic Dysfunction</i> | Hemispherical | Reading as a complex skill: * Skill Component | Difficulties in Word Identification Comprehension Difficulties |
| | | Cerebellar | | |
| | | Magnocellular | | |
| | | Genetic | | |
| | PCB: Cognitive deficit | Perceptive | | |
| | | Phonological | | |
| | | Rapid Naming | | |
| Behavioral | Double deficit | | | |
| | Memory | | | |
| Insufficient practice | | | | |
| Strategic | Strategic Deficit | | | |
| Sociocultural | Constructivist | Experiences with Written Language | Integrated Language | Comprehension Difficulties |
| | | Mediational | Constructivist | - Decoding Difficulties - Comprehension Difficulties |

Table 1. Script-schema for explaining learning disabilities in learning written language and/or for interpreting definitions of dyslexia

Thus far we have been analyzing one of the focal points of the current, forceful controversy over explaining specific learning disabilities in RW. Another focal point of conflict is found in the *conceptualization of the reading process*: reading as a complex skill, integrated language and constructivism (Escoriza, 1996a, 1998a, 2003). One issue under constant debate has to do with differing positions on the relevance of the two components of reading, *decoding* (automatized word identification) and *comprehension* (knowledge construction), in the process of learning to read and write. To assume that the basic skill in the reading process is *automatized word identification* implies assigning greater relevance to an

understanding of the form of RW than to its meaning. Phonemic knowledge is set as the basic prerequisite for carrying out decoding, and learning disabilities in RW are attributable to insufficient phonemic knowledge. For Pressley (1997), as an example, failure in reading is due to deficiencies in phonemic knowledge. Lyon (1995), when analyzing the conceptualization of dyslexia, maintains that dyslexia is a disorder characterized by difficulties in decoding isolated words and that usually it reflects an insufficiency in phonological processing. From this perspective, difficulties should be evaluated at the level of word identification, based on the assumption that *correct decoding of all words guarantees comprehension of the written discourse*. However, both integrated language and constructivism agree that comprehension of meaning is more relevant than knowledge of the form, since reading is essentially a process of knowledge construction, not a word identification skill. Consequently, difficulties in learning written language cannot be reduced to automatized decoding of words, but can be observed in either of the two components of the reading activity: decoding and comprehension. The decoding objective is considered subsidiary to that of comprehension, that is, difficulties arising at the decoding level should require educational attention only in those cases where they significantly affect comprehension. Difficulties in the comprehension component should be evaluated within the strategic knowledge that the student applies for constructing coherent, structured mental representations (Escoriza, 2003).

Dyslexia and phonological knowledge

In the previous section we have described in general terms the situation arising from the sharp controversy between two epistemological arenas: *conceptualization of LD* and *conceptualization of the reading process* (see table 1). The end result is that, despite the volume of research carried out (the relationship between phonological knowledge and reading has been investigated since the 70s, Stahl & Murray, 1994; Escoriza, 1986), there does not yet exist a unified, conclusive explanation as to the causes of specific learning disabilities in written language.

Notwithstanding, we can mention a few proposals which are reaching some level of consensus among researchers. One of these refers to the relationship between a deficit in phonological knowledge and dyslexia. There is a long tradition in dyslexia research which defended the visual perceptive hypothesis. Pogorzelski and Wheldall (2002) consider it to be

widely discredited since recent research has identified a basic language problem to be fundamental, a problem in phonological processing: the presence of the phonological processing deficit leads to a failure to master the alphabetic principle, and consequently, to develop automatized, fluent reading. In explaining dyslexia as caused by a phonological deficit, Frith (1999) states that there is strong evidence that difficulties in the acquisition of reading are related to difficulties in one's aptitude for segmenting the sound sequence into phonemic units, and that, among explanations of dyslexia, the phonological deficit is considered to be the common proximal cause in all of them. Thus, for example, in the definition of dyslexia proposed by the Orton Dyslexia Society Research Committee (1994) (cited by Lyon, 1995, p. 9), it is accepted that dyslexia is *usually* the reflection of inadequacies in phonological processing. In Frith's opinion (1999), the relevance of phonology in learning to read is adopted by all current models of cognitive psychology since the alphabet is based on the idea that oral language can be represented in small, abstract units, the phonemes, which in turn are represented by the graphemes. Consequently, the child's principal task when learning to read in an alphabetic system consists of understanding how to represent oral sounds using letters, and how to accurately translate oral language into written language (and vice versa). The following are some of the basic assumptions which underlie the relationship between phonological knowledge and the learning of written language (Escoriza, 2001 p. 148): (1) written language represents oral language: reading involves translating written language into oral language, (2) comprehension of the alphabetic principle is necessary for word identification in an alphabetic system, (3) reading involves access to the internal lexicon using the graphic representation of oral language, and (4) difficulties found in the process of word identification can make the decoding process less operative and functional and can generate problems in the processes of written language comprehension.

For Howes et al., (2003), disabilities in reading are caused by specific disabilities in language functions involved in processing the sounds in words. According to this hypothesis, dyslexia arises from basic deficiencies in the ability to generate and maintain phonological representations and to manipulate these representations in working memory. Frith (1999) holds that, of all the functions which language can be segmented into, processing the sounds of oral language has been identified as the basic connection point between oral language and written language; difficulties in segmenting the sound sequence are what is related to difficulties in learning to read. This kind of difficulty is what inhibits achieving competency in the use of the alphabetic strategy; this in turn constitutes an obstacle to mastery of the

orthographic strategy, which, according to Frith (1999, 2002), allows for automatic access to the meaning of written words, just as occurs with spoken words. Catts et al. (2002) are emphatic in affirming that the currently most relevant candidate for determining causes of dyslexia are problems in phonological processing: phonological knowledge and related phonological processes.

Defenders of the phonological deficit hypothesis (Sterling et al., 1998; Cline, 2000; Cooke, 2002; Seymour & Duncan, 1997; Thomson, 1999; Frith, 1999, 2002; Tonnessen, 1997; Lyon, 1995; Howes et al., 2003; Shatschneider et al., 2002; Anthony & Lonigan, 2004; Stahl & Murray, 1994; Reynolds, Nicolson & Hambley, 2003; Vellutino & Scanlon, 2002; Zabell & Everatt, 2002, among others) base their position on the relationship which exists between metalinguistic competence and learning to read. According to results from Sterling et al. (1998), the phonological deficit can be manifested in various ways: confusion in phonological memory, insufficient or incorrect elaboration of phonological representations in memory, and deterioration of the phonological base used to produce output (consonant substitution, omission of phonemes, lexical substitutions and phonemic structure not respected). (Other kinds of difficulties observed in dyslexia cases can be found in papers by Cook, 2002; Paradice, 2001; the review by Pressley, 1997; Bryant & Bradley, 1985; Stahl & Murray, 1994; Torgesen et al., 1999; Pugh et al., 2000; Chard, Vaughn & Tyler, 2002).

Difficulties in understanding and applying the alphabetic principle

Learning written language in an alphabetic system requires both comprehension of the alphabetic principle as well as its effective application in order to identify words. McCutchen et al. (2002) maintain that a significant volume of empirical evidence favors considering the alphabetic principle a critical precursor to literacy. Comprehension of the alphabetic principle refers to the explicit knowledge (Wright & Jacobs, 2003) that graphic elements represent corresponding elements of oral language, or, in other words (Escoriza, 2001), to the understanding that letters (graphemic identity) represent the most abstract units of oral language and that words have a particular internal phonological structure made up of individual phonemic segments (phonemic identity). Complementary to comprehension of the alphabetic principle, Bryant and Bradley (1985) suggest that children with reading disabilities are not necessarily lacking adequate phonological knowledge, but rather they have problems

in the flexible application of this knowledge to word identification. Likewise, Greany, Tunmer and Chapman (1997) confirmed that children with reading disabilities showed adequate knowledge of onset and rime in words, and they had good segmenting skills, but they presented difficulties in applying this knowledge to the process of word identification. According to Torgesen et al. (1999), the most important impact of the weak aptitude in processing phonological information is shown in difficulties which the children experience in understanding and applying the alphabetic principle when it comes to decoding written words. In order to learn to read (Ehri, 2002), children must acquire knowledge of the alphabetic system and must learn to use it for reading and writing words. Vellutino and Scanlon (2002) consider that children who learn to read in an alphabetic orthography must comprehend and acquire functional use of the alphabetic principle.

Understanding the alphabetic principle implies internalization of a number of diverse content items, all of which refer to knowledge of relationships that exist between oral and written language at the level of lexical structure, while the processing of language sounds is the critical relationship that connects the two. According to Frith (1999), the alphabetic principle is based on the idea that oral language can be represented by small units, the phonemes, which are represented through letters, and therefore, the child's main task when learning to read is to comprehend how oral sounds can and must be represented using letters, and how to translate oral language to written language. For Silva and Alves (2003), comprehension of the alphabetic principle involves understanding: (1) the relationship between oral language and written language at the level of phoneme-grapheme segments, (2) the notational function of writing and that this function becomes operative as a last resort in relating oral language and written language at the level of phonemic-graphemic segments, (3) that letters constitute a concrete format for representing abstract segments of oral language (phonemes), that is, the codified writing of oral language segments.

McCutchen et al. (2002) mention the following two components of the alphabetic principle: that oral language is composed of phonemes, and that letters represent these phonemes. Wright and Jacobs (2003) maintain that the objective of educational intervention is to center attention on the phonological segments of words and on rules and principles of the grapheme-phoneme correspondence both in reading and in writing, thus promoting an understanding of the alphabetic principle in its three components: understanding the internal phonological structure of the spoken word, understanding that changes in the internal structure

of the word lead to changes in its meaning, and understanding that changes in the lexical meaning generate changes in the phonological structure, in most cases. As for ourselves (Escoriza, 2001), it is our view that the following are involved in understanding the alphabetic principle:

A. In general, understanding that the spoken word can be segmented into smaller and smaller units (that it is a segmentable whole; that it has an internal structure) and that a certain relationship exists between these units and the graphemes that make up the written word that represents them. Each word has its own phonemic, graphemic and semantic identity. Changes in the form (phonological and/or graphemic) implies changes in the meaning.

B. In particular, there are three components that must be taken into account when establishing the above correspondence:

a. *Number or quantity of phonemes*: in order to correctly read/write a word, all phonemes of the spoken word must be represented. Spoken words are composed of a limited, concrete number of phonemes which require an equally limited, concrete number of graphemes. Therefore, the establishment of correct phoneme-grapheme correspondences requires that phonemes be represented in their totality via the necessary graphemes, neither adding nor omitting any of the phonemic segments which define the sound structure of the spoken word.

b. *Order or sequencing of phonemes*: in order to correctly read/write a word, phonemes must be represented in the order or sequence defined by the structure of the spoken word. Spoken words have their own internal structure wherein the phonemes have a definite order and whose sequence must be respected when it comes to specifying the right graphemic sequence for each spoken word.

c. *Identity of phonemes*: in order to correctly read/write a word, one must take into account the phonemic and graphemic identity of each of the corresponding sublexical segments. Spoken words are made up of phonemic units which must be explicitly identified in the sound sequence of language: they define the phonological identity of each lexical unit, and consequently must be properly represented by the corresponding graphemes.

Difficulties observed in understanding and applying the alphabetic principle can be categorized into the following compensatory phonological strategies; these are typically employed by students in order to resolve conflicts when establishing the necessary phonemic-

graphemic correspondences between the structure of the spoken word and the written word (a detailed analysis of categories of difficulties and their possible explanations can be found in Escoriza & Boj, 1997):

a. *Adding phonemes.* When using this strategy, the pupil tries to solve the problem of establishing phoneme-grapheme correspondences that arises when a word's syllabic structure presents a consonant cluster onset and/or rimes consisting of vowel and consonant. Difficulties in understanding and applying the first component of the alphabetic principle are seen when an internal parasitic vowel, its phonetic nature copied from the syllable's central vowel, is inserted into the consonant cluster: the syllable "fle" is represented as "fele".

b. *Inverted sequencing of phonemes.* This strategy involves changing the order of phonemes when producing their graphemic representation. As such it constitutes a manifestation of difficulties in understanding and applying the second component of the alphabetic principle: proper ordering of the phonemic-graphemic correspondence. Thus, for example, the word "spot" is graphemically represented as "sopt".

c. *Omission of phonemes.* This is one of the compensatory strategies most utilized by students in early stages of learning written language. Its application is apparent in the omission of phonemes within intrasyllabic units: deletion of a phoneme from a consonant cluster in syllabic onset (for example, the word "zebra" is written as "zeba") and/or deletion of the consonant phoneme in syllabic rime (for example: the word "picnic" is written as "pinic").

d. *Substitution of phonemes.* The phoneme as an abstract linguistic unit (it does not exist on its own in the acoustic signal) and phenomena of coarticulation or parallel transmission have been indicated as two explanatory causes of difficulties produced in the identification of phonemes. Phonemes (Share, 1995) are abstract representations of families of phonetic sounds which vary considerably as a function of pronunciation speed, intonation, and above all, coarticulation or parallel transmission. One of the conclusions formulated by Stuart (1986) is that, until the child has acquired the concept of phoneme as an abstract linguistic unit, he or she will only be able to treat and comprehend surface variants of the sound structure of a word in terms of phonetic traits. Manifestations of this type of strategy take on different forms. One of these consists of the phonetic confusion produced between the phonemes 'b' and 'm' in the context of the word (for example: the word "Bambi", shows up

as “*Mammì*”; “*bending*”, as “*dending*”). When we wish to avoid undesired effects generated from this type of phonemic substitution in ordinary communicative interchange, or when we have to spell a word which we want to be correctly represented, we typically use the technique of “d” as in David, “b” as in “boy”, “m” as in “money”, or examples like “one billion, with a b”, in order to make it clear that we are not speaking of a “million”, but rather a much larger number (this apparently simple task presents a certain complexity for those persons who have difficulty in understanding and applying the alphabetic principle).

These four compensatory phonological strategies, all of them having a phonetic nature, can be considered the manifestation of difficulties in understanding and applying each of the components of the alphabetic principle (table 2): the *addition* and *omission* of phonemes are indicative that the pupil has not understood the first component (number of phonemes required for reading/writing a word), the *inversion* of phonemes reveals difficulty with the second component (order, sequence or phonemic structure of the word) and *substitutions* are produced due to problems with applying the third component (phoneme identity).

| Components of the Alphabetic Principle | Compensatory Phonological Strategy | Syllabic Structure | | | Intrasyllabic Unit | | Specific Phonemes |
|--|------------------------------------|--------------------|-------|------|--------------------|------|-------------------|
| | | C-V | C-V+C | CC-V | Onset | Rime | |
| a. Number | Addition | | | | | | |
| | Omission | | | | | | |
| b. Sequence | Inversion | | | | | | |
| c. Identity | Substitution | | | | | | |
| Totals | | | | | | | |

Table 2. Procedure for evaluating phonological knowledge

As a whole, the components of the alphabetic principle, together with the phonological strategies listed above, allow us to interpret dyslexia, or specific learning disabilities in written language, in the following terms:

a. Characterized by difficulty in identifying words in a fluent/automatized fashion and correctly/accurately (phonemic, graphemic and semantic identity), which affects and is linked to the decoding component of written language, i.e. the degree to which literacy competence is developed at the lexical or word level.

b. The origin of these difficulties lies in an insufficient understanding of the various components of the alphabetic principle and/or in an incorrect application of its components, due to limited or inadequate literacy experience; or, as Kozulin (2000) states, making

reference to mediatized learning experiences, an insufficient quantity of mediation, and conditions that make a normal quantity or type of mediation insufficient or inadequate. For Bryant and Bradley (1985), reading disabilities should not be interpreted as skill deficits, but as a skill which is still undeveloped, and therefore is not a question of deficit but of development (or of level of literacy competency, Escoriza, 1996c, 1998a). Problems arising in understanding and/or applying the alphabetic principle can be observed in the use of the above compensatory phonological strategies (*addition, inversion, omission and deletion* of phonemes), all of these indicative of progress attained by the pupil in the process of internalizing phonological awareness.

c. The consequence is low-level use of written language as a multifunctional psychological instrument in its sociocultural setting (an instrument of learning, communicative and regulating).

In order to evaluate the process of internalizing phonological awareness, two general procedures have been applied: psychometric evaluation and dynamic evaluation. In our case we propose the second system, which Scheneider and Ganschow (2000) consider an adequate method for evaluating intellectual potential and which is founded on the assumption that persons can modify and improve their learning processes if they participate in interactive activities with teachers who provide adequate experiences of mediatized learning. In dynamic evaluation (Scheneider & Ganschow, 2000), the following take on special relevance: the role of the teacher as mediator and facilitator of the pupil's learning process, the integration/interrelation of evaluation and teaching, and an emphasis on the process more than on the product.

We have stated elsewhere (Escoriza, 1998b) that evaluation as a process involves answering four questions: What, how, when and why to evaluate. Answering these questions implies, among other things, specifying the actual subject who is doing the learning, whether it be the pupil alone, or, as Kozulin (2000) proposes, the integrated whole which includes the child, the adult expert and the symbolic instrument provided by a given society. In the latter case, learning disabilities in written language should be analyzed and evaluated in the dynamic context of the unit which is formed by the learner, literacy experiences, and the teacher.

In the case of learning disabilities, Dwairy (2004) formulates the following criticism of evaluation through tests: Learning to read and write is an integrative process where cognitive

functions operate simultaneously and differently from how they operate in cognitive tests. The separate evaluation of specific psychological functions does not correspond to the integrative cognitive processes which take place in the learner. Normally, tests evaluate what has been learned and not what can be learned when another expert person provides teaching and competent, effective guidance. What should be evaluated is progress (potential execution) during the process, and not the product in terms of performance (current execution). We can consider comments by Wearmouth and Reid (2000) as belonging to this same dissenting line, when they state that tests cannot indicate adequate intervention strategies, since scores do not provide details of what the child knows or does not know, nor do they reveal processes which are involved in the child's difficulties (Weaver, 1990, also performed a critical analysis).

Keeping all these considerations in mind, we propose an evaluation system which presents the following characteristics (tables 2, 3 and 4):

a. *What to evaluate*: the pupil's progress when participating in functional, propositional literacy activities, guided by educational assistance which the teacher provides. Specifically, regarding the issues we are analyzing here, one would evaluate the development of the student's competence in explicit manipulation of phonological representations of phonemic segments which form part of the sound structure of the spoken word: *comprehension and functional application of each of the components of the alphabetic principle*.

b. *How to evaluate*: the evaluation procedure which we suggest (Escoriza, 2001, 2002) takes the dynamic context defined by pupil/psychological instrument/teacher as the unit of analysis, and implies a process aimed at obtaining information about the pupil's progress (potential execution) in comprehension and functional application of the components of the alphabetic principle.

c. *Why evaluate*: the purpose of data obtained through the evaluation process should be to accurately specify the pupil's most relevant educational needs. The needful, unavoidable integration between evaluation and teaching leads us to use this information for designing and developing an educational intervention process contingent on the educational needs identified. In our case (see table 2), this information should allow us to determine which component or components of the alphabetic principle require different educational treatment, and which types of content (syllabic structure, intrasyllabic unit, specific phonemic units) are most pertinent and how to sequence them as a function of the educational objectives in view. In

designing the educational intervention process, the general objective is to promote understanding and application of the alphabetic principle, and specific objectives refer to promoting comprehension and application of the specific component where we observe that the pupil continues to use any of the compensatory phonological strategies. As to content, we should propose literacy activities (identification, deletion, addition, segmentation, integration, phoneme sequencing, etc.) where the pupil has the opportunity to carry out cognitive operations involving manipulation of phonemes in those syllabic structures and intrasyllabic units where the student shows insufficient comprehension or an improper application.

| Components of the Alphabetic Principle | | Compensatory Phonological Strategy | Syllabic Structure | | | Intrasyllabic Unit | | Specific Phonemes |
|--|---|------------------------------------|--------------------|--------------|-------------|--------------------|-------------|-------------------|
| | | | <i>C-V</i> | <i>C-V+C</i> | <i>CC-V</i> | <i>Onset</i> | <i>Rime</i> | |
| a. Number | 1 | Addition | | | | | | |
| | | Omission | 1 | | 1 | | 1 | m |
| b. Sequence | | Inversion | | | | | | |
| c. Identity | 2 | Substitution | 2 | 2 | | 2 | | b |
| Totals | | | | | | | | |

Table 3. Example 1 of the Procedure which can be followed to evaluate phonological knowledge of a concrete pupil: Word written: “Mami”, instead of *Bambi*

| Components of the Alphabetic Principle | | Compensatory Phonological Strategy | Syllabic Structure | | | Intrasyllabic Unit | | Specific Phonemes |
|--|---|------------------------------------|--------------------|--------------|-----------------------------|--------------------|-------------|-------------------|
| | | | <i>C-V</i> | <i>C-V+C</i> | <i>CC-V</i> <i>CC-VC</i> | <i>Onset</i> | <i>Rime</i> | |
| a. Number | 3 | Addition | 1 | | 1 | 1 | | O |
| | | Omission | 2 | | 3 | | 3 | MM |
| b. Sequence | 1 | Inversion | 1 | | 1 | 1 | | R |
| c. Identity | 3 | Substitution | 3 | 2 | 1 | 3 | | BBB |
| Totals | 7 | 7 | 2 | 4 | 2 | 5 | 3 | |

Table 4. Example of the complete procedure for evaluating phonological knowledge. Words written: “Mami” instead of *Bambi*, “sold” instead of *sold*, “meding” instead of *bending*, “tarvel” instead of *travel*.

Finally, some brief considerations regarding the nature and orientation of educational intervention processes (Escoriza & Boj, 1992abcd). Recommendations and programs designed to date show profound differences. On one hand, some defend the decontextualized teaching of phonological awareness based on its assigned relevance in phonological recoding and the automatization of decoding in word identification (programs are closely related to the phonological deficit hypothesis and the double deficit hypothesis, Sterling et al., 1998; Cooke, 2002; Howes et al., 2003; Frith, 1999; Catts et al., 2002; Sodoro et al., 2002; Chard, Vaughn & Tyler, 2002; among others). Some examples of this kind of proposal are studies performed by Reason and Morfidi (2001), Vellutino and Scanlon (2002), Slocum, O'Connor and Jenking (1993), Torgesen et al., (1999), Brooks and Weeks (1998), Seymour and Duncan (1997) etc.; they are based to varying degrees on premises which underlie the conceptualization of reading from the linear perspective (Escoriza, 1996a; Weaver, 1990; Pressley, 1999). On the other hand, others emphasize contextualized instruction of written language (integrated language, constructivism, Escoriza 1996a, 2003), giving priority to functional, propositional literacy experiences (knowledge of the functions of written language) and not to the knowledge of form (Escoriza & Boj, 1991; Weaver, 1990; Bergeron, 1990; Pressley, 1999). Vygotski (in Kozulin, 2000, p. 34) recommended teaching written language first by asking the children to designate certain objects by means of pictograms and signs, and once this essential symbolic function was acquired, they should proceed from first-order symbolism (using signs to represent the content of a sentence) to second-order symbolism (using letters to represent words), that is, *teaching the function of symbolization before giving instruction on specific techniques of written language*. Pressley (1999), commenting on integrated language, states that this interpretation of written language assigns more primacy to the natural development of literacy than to development based on the teaching of basic reading skills, and that consequently, in classrooms where this is applied, the teaching of such skills is only carried out when certain students need it, and only in the context of reading and writing and not as an essential point of instruction. Literacy experiences take priority over direct teaching of decoding. While the first type of approach focuses generally on the word or the phoneme as linguistic unit, the second type centers the intervention on process and meaning, on reading and writing activities as simultaneous, interactive processes. According to Edwards (2003), several studies have shown that writing can facilitate reading, word analysis, etc., since practice in writing words can be a concrete way to reinforce phonemic knowledge and facilitate the reading of words. Along these lines, Edwards mentions the work of Treiman

with regard to promoting analysis of spoken words, and the knowledge of how these sounds and words are represented via written language. As Edwards (2003) indicates, the results suggest that children with learning disabilities need to participate in activities where the alphabetic principle may be internalized more comprehensively and more functionally than can be done through phonetic-type methods. Teaching the functional application of the alphabetic principle through writing practice is considered a more meaningful and motivating way of learning than is the learning of isolated phonemes, since writing is an integrated global activity that must be performed necessarily in a discursive situation. The discursive situation offers all the conditions to make possible the transition from alphabetic writing to orthographic writing, which in essence is what characterizes a person who has no difficulty with the decoding component. For Lundberg (2002), the productive use of an alphabetic writing system requires explicit knowledge of phonemes and conscious control of these units, allowing them to be manipulated, substituted and recombined. (This proposal is closely related to the developmental theory by U. Frith, where she recommends promoting the alphabetic strategic through writing, with the purpose of producing the transition from logographic reading to orthographic reading). Promoting understanding and functional application of the alphabetic principle, promoting the transformation of alphabetic knowledge into orthographic knowledge, making decoding operational, these are all objectives that can be achieved through functional, propositional literacy experiences (writing and reading activities in a discursive situation).

We suggest the following by way of general criteria to keep in mind when designing an educational intervention process aimed at promoting understanding and functional application of the alphabetic principle: avoid teaching isolated or decontextualized skills (or as Bergeron suggests, 1990, avoid using skill sequences to organize your teaching), consider oral language and written language, reading and writing, as complementary, simultaneous, interactive, transactional activities, give special relevance to writing practice, promote the concept of the word as a linguistic unit which has its own identity (phonemic, graphemic, semantic) and the internalization of alternative, complementary strategies to identify unfamiliar words found in writing discourse (Vellutino & Scanlon, 2002; we could also mention the compensatory interactive model by Stanovich), select and sequence content and activities as a function of planned educational objectives. In our case, as indicated above, the educational objective is very clear and concrete (table 2): *promoting comprehension and functional application of one or more of the three components of the alphabetic principle*. As

for the type of activities, select and sequence those activities where: (1) a direct relationship is produced between form and meaning (understand that changes in form generate changes in meaning), (2) they involve understanding that words are composed of internal phonemic segments, and (3) they include manipulation of phonological representations (segmentation, addition, synthesis, etc. of such segments). For Seymour and Duncan (1997), the basic question consists of the division of words into phonemes (abstract linguistic units difficult to perceive and to identify), and that require the establishment of correspondences between phonemes and graphemes (that words are composed of letters, that letters are representations of sound units, that all letters and their positions are important). Seymour and Duncan (1997) consider that the key problem to solve is the way in which letters represent phonemes, etc.

In order to carry out the above activities, use tasks that have been studied and applied for promoting phonemic knowledge (Escoriza, 1990-1991, Escoriza & Boj, 1992a, 1997): Elkonin's task, recommended especially in the case of the first component of the alphabetic principle, Slingerland and Stuart's tasks, for the second and third components, combination of two or three tasks (Elkonin, Slingerland & Stuart) in the case that the pupil's educational needs recommend it, and select tasks (see Escoriza y Boj, 1997 and Defior, 1996) that are considered more pertinent for specifically promoting understanding of each of the three components of the alphabetic principle or that can be directly related to each of the four compensatory strategies: addition, omission, inversion and substitution of phonemes. One supposition may be of the following type: "We have observed in the pupil's written production of words that she adds some unnecessary phonemes (*sopot*, instead of *spot*) or omits some of the necessary phonemes when making her graphemic representation (*pinic*, instead of *picnic*). Given this, we consider that she has difficulty understanding and applying the first component of the alphabetic principle (number or quantity of phonemes). The first appropriate task to assign is Elkonin's task (afterward we could combine it, for example, with Slingerland's) and following this we should select from tasks by Escoriza and Boj (1997) or by Defior, (1996), those we consider most pertinent when taking into account the educational objective and its manifestation through use of the two applied phonological strategies: addition and omission."

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