RIVISTA INTERNAZIONALE DI FILOSOFIA E PSICOLOGIA
DOI: 10.4453/rifp.2017.0026
ISSN 2039-4667; E-ISSN 2239-2629
Vol. 8 (2017), n. 3, pp. 309-315

TEMI ED EVENTI

# An Approach to Developmental Dyslexia from Vygotskij's Perspective

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Ricevuto: 04 febbraio 2017; accettato: 30 novembre 2017

**Abstract** If a child's development is made possible by interaction with his environment, involving an integration of affective and intellectual processes, dyslexia implies multiple cognitive deficits that cause learning difficulties and over time can affect a child's sense of self. Inattentive behavior due to incomprehension of classroom tasks can cause compounding of gaps in learning that will lead to a lack of foundational skills. Vygotskij underlines how the zone of proximal development determines the difference between the child's actual level of development and the level of performance that he achieves under the guidance of a teacher, through imitation; the teacher must focus his efforts on identifying what the child is only able to do in collaboration today but will be able to do independently tomorrow. The main means of interaction between the teacher and the dyslexic child is the language that, materialized and objectified in external speech, then distilled into thought as internal speech can arm dyslexic children with foundational skills.
KEYWORDS: L.S. Vygotskij; Dyslexia; Language; Learning; Zone of Proximal Development

**Riassunto** *Un approccio alla dislessia evolutiva da una prospettiva Vygotskijana* – Se lo sviluppo del bambino è reso possibile dall'interazione con il suo ambiente, attraverso l'integrazione di processi affettivi e intellettuali, la dislessia implica molteplici deficit cognitivi con conseguenti difficoltà di apprendimento, che col tempo possono condizionare la percezione che il bambino ha di sé. Il comportamento disattento in classe, dovuto all'incomprensione dei compiti assegnati, può generare un accumulo tale di lacune nell'apprendimento da condurre al mancato sviluppo di abilità fondamentali. Vygotskij sottolinea come la zona di sviluppo prossimale denoti la differenza tra il livello di sviluppo effettivamente raggiunto dal bambino e le prestazioni ottenute sotto la guida di un insegnante, per mezzo dell'imitazione del maestro. Compito dell'insegnante è concentrare gli sforzi al fine di individuare quanto il bambino è in grado di realizzare oggi in collaborazione, che domani sarà in grado di effettuare autonomamente. Il principale mezzo di interazione tra l'insegnante e il bambino dislessico è il linguaggio che, materializzato e oggettivato nel linguaggio esterno, successivamente condensato nel pensiero come linguaggio interno, può consentire ai bambini dislessici lo sviluppo di abilità fondamentali.
PAROLE CHIAVE: L.S. Vygotskij; Dislessia; Linguaggio; Apprendimento; Zona di sviluppo prossimale

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WHEN WE CONSIDER WHAT SOMEBODY looks like we think of their body type, hair color and eye color, characteristics that pass from parent to offspring. In the transmission of these characteristics from one generation to the next, epigenetic changes – modifications of the phenotype without changes to the genotype – occur, also influenced by factors such as environment, lifestyle or disease states. Fetal alcohol syndrome – brain damage leading to developmental, cognitive and behavioral disabilities caused by alcohol abuse during pregnancy – demonstrates how such processes can affect the brain. Epigenetic mechanisms lead to functionally relevant modifications of the genome as they induce stable changes in gene expression which consequently influence the phenotypic outcome. The epigenetic perspective can explain a large number of phenomena, including the behavioral and physical abnormalities arising from pre-conception and in utero ethanol exposure; in particular, the findings suggest that offspring not directly exposed to alcohol in utero may nevertheless be born with developmental abnormalities if their father or mother consumed alcohol prior to conception.[1] The epigenetic perspective may also suggest that a surfeit of food during the paternal grandfather's slow growth period (age 9-12) is associated with the reduced longevity, as well as increased diabetes mortality, of his grandchildren. In the same way, poor food availability in the paternal grandparent's generation is associated with decreased mortality risk ratios in grandchildren.

In book VIII, 4 of *Politics*, Aristotle considers how brutal nature – a savage character – does not promote courage. He recommends light training until the age of puberty followed by three years of study: overdoing physical training overstrains the faculties in youth and results in spoiling the mind. Working the mind and the body simultaneously is counterproductive because the mind and the body reciprocally influence each other. Practicing sport shapes your body and improves physical skills, but high performance depends on mental components: training the mind can change the physical brain, modifying both the structure and function of the brain, creating new neurons and synaptic connections.[2] The posterior hippocampus stores spatial representations of the environment, and magnetic resonance imaging of the brain showed that the posterior hippocampi of licensed taxi drivers in London were significantly larger than those of subjects who did not drive taxis: taxi drivers in London must undergo extensive training, learning to navigate between thousands of places in the city, and pass a very stringent set of police examinations to be licensed to operate.[3]

Emotionally traumatic experiences, such as child abandonment, have critical impacts on a child's sense of self, trust in others, self-confidence, and affect a child's perception of his or her ability to learn: the child will have special educational needs even though he has no physical, sensory, mental health disability. It's interesting to consider how empathy – experiencing identification with another person's condition from his perspective, seeing with his eyes, putting ourselves in another person's shoes –, made possible by "mirror neurons" which react to emotions expressed by others and then reproduce them, involves the affective system as well as the cognitive system when experiencing an emotional evaluation. For example, sharing feelings with others first of all requires being able to distinguish between our own and other people's feelings. Lev Semënovič Vygotskij underscores how every child brings a different attitude to a situation and emotionally experiences the situation in a different way, so the influence which the situation exerts on the development of each child will be different. Vygotskij refers to «a dynamic meaningful system that constitutes a unity of affective and intellectual processes. Every idea contains some remnant of the individual's affective relationship to that aspect of reality which it represents»,[4] so «the presence of affective stimuli is an indispensable adjunct

to every new stage in the development of child from the lowest to the highest».[5] In fact, the influence of the situation depends not only on the nature of the situation itself, but also on the extent of the child's understanding and awareness of the situation. A child with normal intellect fully comprehends the sense and meaning of what is happening to him, is capable of generalizing by developing feelings, a sense of inferiority or of self-esteem. Emotional experience leads to generalization – represented by the meaning of any word related to a certain class or group of objects – and this is constructed by children in a different way than by adults, i.e. not yet with concept formation, but in a more concrete, more visual and more factual way: the child interprets reality, apprehends the events which are happening around him, reworking and reshaping them to suit himself. This means that the child at different stages of his development does not generalize to the same extent, and consequently, he interprets and imagines the surrounding reality and environment in a different way; the child himself changes and his relation to the situation changes, so the environment exerts this or that type of influence on the child's development via the child's emotional experiences.

## The influence of emotional experience associated with dyslexia on thinking

The interaction between the child and the environment, i.e. the child's emotional experiences, presupposes and develops a generalized reflection of reality expressed in word meaning. E.g. a small child draws first, then decides what it is that he has drawn; at a slightly older age, he names his drawing when it is half done; and, finally, he decides beforehand what he will draw. So «the word is almost always ready when the concept is. Therefore, it may be appropriate to view word meaning not only as a unity of thinking and speech but as a unity of generalization and social interaction, a unity of thinking and communication».[6] In fact, in Vygotskij's conception, the primary function of speech – generalization and the development of verbal meaning –, in both children and adults, is communication, social contact. Speech is a means of social interaction, a means of expression and understanding: «speech plays a role in the function of personal contact, plays a role like activity connected with people, that is, it is external and cooperative – in the form of a dialogue».[7] The earliest speech of the child is therefore essentially social. At first it is global and multifunctional; later these functions become differentiated. At a certain age the social speech of the child is quite sharply divided into egocentric and communicative speech; the inner speech of the adult represents his "thinking for himself" rather than social adaptation, i.e. it has the same function that egocentric speech has in the child.

Essentially, the development of inner speech depends on outside factors: Vygotskij thinks that the child starts conversing with himself as he has been doing with others. When circumstances force him to stop and think, he is likely to think aloud. Egocentric speech, splintered off from general social speech, in time leads to inner speech, which develops through a slow accumulation of functional and structural changes and serves both autistic and logical thinking. Inner speech is not only mute, silent, because it is speech for oneself, and its vocalization fades, it also becomes more internal in its function and structure and has a different organization from external speech: inner speech is characterized by the simplification of syntax, the minimization of syntactic differentiation, the expression of thought in condensed form and a reduction in the quantity of words that moves toward a telegraphic style, i.e. a tendency toward a form of fragmentation and abbreviation where the predicate and related words are preserved while the subject or other words are omitted, because implied. This tendency toward an extremely simplified predicative syntax in inner speech is a process that involves the distillation of speech in

thought while external speech is a process of transforming thought into word, i.e. the materialization and objectification of thought.

Dyslexia – classified under "Specific Developmental Disorders of Scholastic Skills" in the psychiatric classifications of the ICD-10 World Health Organization 1992, and under "Learning Disorders" in the DSM-IV American Psychiatric Association 1994 – is a specific learning difficulty that seems to affect only external speech while in inner speech words can be replaced by a mental representation or image in memory: inner speech differs from external speech in the same way that a representation of an object differs from the object itself. However research results suggest the importance of alterations in the visuo-spatial and phonological loop in dyslexic children that may result in difficulties with similar words and spatial information;[8] keeping in mind and integrating new information, recalling stored information and simultaneously manipulating and processing it in thinking during complex and demanding activities, identifying words and understanding text, and processing and interpreting visual information can exceed the capacity of the reduced working memory of dyslexic children. The heavy working memory demands of classroom instructions and activity, e.g. multi-step instructions or activities that require large amounts of information to be kept in mind, cause failure in the classroom because the working memory load associated with each activity exceed the capacities of dyslexic children. In addition, research results document a generalized impairment of episodic long-term memory capacities in dyslexic children and these results do not vary as a function of children's age, with the consequence that long-term memory deficits in dyslexia are not limited to the dysfunction of phonological components but also involve visual-object and visual-spatial aspects, thus suggesting that dyslexia is associated with multiple cognitive deficits.[9]

There are currently no universally accepted diagnostic criteria for identifying children with dyslexia: this is why the definition of dyslexia is obtained by exclusion, i.e. ruling out disabilities attributed primarily to mental retardation, to emotional disturbance, to cultural differences, to economic disadvantage, to visual, hearing, or motor disabilities, even though some researchers view dyslexia more as a deficit in motor automaticity rather than a deficit in phonological skills. There is now strong consensus on the approach that relates dyslexia to reading and, consequently, the hypothesis that a range of phonological skill deficits are involved in the failure to learn to read – although other systems and processes may also contribute to the difficulty –, with the consequence that virtually all children scoring below the benchmark on standardized reading tests can meet the criteria for having dyslexia. Nevertheless, there is no clear demarcation between students with normal reading abilities and those with mild reading difficulties: reading and reading difficulty occur along a continuum, with reading difficulty representing the lower tail of a normal distribution of reading ability. Consequently, dyslexic children have been ineligible for special education services because their characteristics have not corresponded to any recognized categories of disability, but rather revealed a discrepancy between the children's academic achievement and their apparent capacity to learn: dyslexia reflects unexpected learning problems in seemingly capable children, who otherwise possess the intelligence and motivation considered necessary for accurate and fluent reading.

Concretely, dyslexia emerges in a specific context, i.e. the classroom, when – on the basis of the assumption of homogeneity – the teacher and other students associate the difficulty of the dyslexic learner with mental retardation or emotional disturbance and interact as though the dyslexic students really possessed these expected characteristics, with a strong impact on dyslexic students' beliefs and attitude. The dyslexic label partially corrects this misunderstanding, but nevertheless defines a status group and shapes how parents, teachers and other students, perceive

dyslexic learners; in fact, currently, researchers have observed how labeled students' outcomes are even poorer than those of otherwise similar youth not labeled with a dyslexia diagnosis. Therefore, separate classrooms, teachers, and even curricula based on the diagnosis of dyslexia, rather than on prior achievement and potential, contribute to the creation, the support and exacerbation of disability, even in integrated settings, with the consequence that special education placement limits rather than expands dyslexic students' opportunities; whereas, when teachers effectively differentiate instruction – enabling dyslexic students to demonstrate competence in varied, meaningful ways, and to act as helpers as often as they act as helpees –, dyslexic students can participate successfully as full members of heterogeneous inclusive classrooms.

Otherwise, incapable of understanding the task or instruction in the classroom, children forget what they are doing and this can lead to inattentive behavior and successively to mental disorders. Comorbidity, i.e. the presence of more concomitant disorders as well as multiple manifestations of a disorder, can also results from the distress of emotionally traumatic experiences caused by learning difficulties: by isolating thinking from affect, we cut off the motivating force, the needs, interests, incentives and tendencies that direct the movement of thought in one direction or another. In Vygotskij's conception, thinking in concepts is not possible in the absence of verbal thinking and it means that thought development is determined by language, and ultimately by the socio-cultural experience of the child. In fact, the child begins with the whole and only subsequently partitions its fused thought which is expressed in the one-word sentence into a series of separate though interconnected verbal meanings. The primitive natural stage, corresponding to pre-intellectual speech and preverbal thought, evolves through the child's emotional experience with the physical properties of his own body and of the objects around him. The external operation turns inward and undergoes a profound change in the process: the child begins to count in his head, to use "logical memory," i.e. to operate with inherent relationships and inner signs. In speech development this is the final stage of inner, soundless speech, but remains a constant interaction between outer and inner operations. Experience is primarily sociocultural, so the words serve as a means of interaction and mutual understanding between the child and adult. The child begins to use words and understand the words of adults at a very early age, in the second year of his life, but the fully developed concept emerges at a late stage in the development of the child's thinking, when the child achieves a high level of socialization; verbal interaction with adults becomes the motivating force behind the development of the child's concepts. The child begins to apply concepts in practice and operate with them long before he gains conscious awareness of them.

## The role of language in dyslexic children's learning

Vygotskij underlines how the child's instruction in speech, and school instruction generally, is largely a function of imitation. Observational learning also gives dyslexic children the possibility of moving from what they can do to what they cannot through imitation. In school, the child receives instruction not in what he can do independently but in what he cannot do yet. He receives instruction in what is accessible to him in collaboration with or under the guidance of a teacher. This is a fundamental characteristic of instruction: the teacher must focus his work not on yesterday's but rather on tomorrow's developments so that what the child is able to do collaboratively today what he will be able to do independently tomorrow. Therefore, the *zone of proximal development* determines the domain of transitions that are accessible to the child, i.e. the difference between the child's actual level of development

and the level of performance that he achieves in collaboration with the adult. Also, a dyslexic child works better collaboratively than independently and he advances in terms of the level of the intellectual difficulties he is able to face, but the extent to which collaboration can contribute to the child's performance is restricted to limits which are determined by the state of his development and his intellectual potential: the child does not solve all unresolved problems with the help of imitation, but advances only up to a certain limit, a limit which differs for different children. In fact, the incompetent child in a group of competent children will be delayed in his development and in the relative success of his mental activity. So, will the competent child in a group of incompetent children. For one of these children the problem lies in the fact that instruction is too difficult – for the other in the fact that it is too easy.

These opposing conditions lead to the same result. In both cases, instruction occurs outside the *zone of proximal development*, below it in one case and above it in the other. It is as fruitless to teach the child what he is not able to learn as it is to teach him what he can already do independently. It means that the teacher has to adapt his approach to teaching – for example – to reduce memory load in the classroom, through breaking tasks and instructions down into smaller steps, representing information, using memory aids and fostering an environment in which children feel able to ask if they have forgotten what they should be doing, in case – of course – the task is not to check memory capacities. An alternative approach is to try to improve, for example, the working memory of dyslexic children, but Vygotskij considers it a mistake to take the path of least resistance, towards the child's weakness rather than his strength. In school, each subject demands more than the child is capable of, leading the child to carry out activities that force him to rise above himself, but this presupposes a certain level of development in spontaneous concepts that scientific concepts restructure and raise to a higher level, forming their *zone of proximal development*.

Inattentive behavior in a dyslexic child often results from the emotionally traumatic experience of being incapable of understanding the task or instruction in the classroom, with consequences for the sense of self and the child's perception of his or her ability to learn; frequent lost learning opportunities also compound learning gaps that become over time so severe and pronounced as to prevent formal concepts from restructuring and raising spontaneous concepts to a higher level. Considering that at any stage the existing system is a prerequisite for the development of a new system, the lack of foundational skills makes dyslexic children fall well behind their schoolmates with no possibility for remediation.

In fact, nowadays, dyslexia is discerned mainly in association with educational tasks that prioritize memorizing rules rather than understanding, namely, when the compensative strategies adopted by dyslexic learners are useless. By contrast, when students are allowed to do tasks differently, in the way that suits them, the performance of dyslexic learners doesn't just match that of peers but can be better, with the consequence that the dyslexic label loses its negative connotation. On February 11th 2016, *The Guardian* reported on a job advertisement released by *The Garage*, which aims to provide "innovative thinking" for businesses, and stipulates that applicants must be dyslexic; a few years before, in 2014, *The Telegraph* referred to a job alert of the British intelligence agency GCHQ aimed at employing more than 100 dyslexic and dyspraxic "neuro-diverse" individuals to harness their analytical skills, their ability to analyze complex information in a "dispassionate, logical and analytical" way. What makes the difference is the environment that shapes the child's brain; if it's true that the language environment maps cognitive development – since, encoding information from the sensory system, the brain develops concepts, beliefs and social cogni-

tions –, when education becomes a toxic environment for dyslexic students and compensative strategies are rendered useless only a passionate interest of some kind can help the child find interconnections in an apparently unrelated collection of rules for educational tasks.

In order to fulfill this goal, according to Vygotskij's conception, language is the key: through language it is possible to arm dyslexic children with foundational skills, because language is the main means of interaction, and consequently of emotional experience, between the teacher and the dyslexic child, and between the dyslexic child and his schoolmates.

## Notes

[1] See P.C. HAYCOCK, *Fetal Alcohol Spectrum Disorders*, in: «Biology of Reproduction», vol. LXXXI, n. 4, 2009, pp. 607-617.

[2] See B. DRAGANSKI, C. GASER, G. KEMPERMANN, G.H. KUHN, J. WINKLER, C. BÜCHEL, A. MAY, *Temporal and Spatial Dynamics of Brain Structure Changes during Extensive Learning*, in: «The Journal of Neuroscience», vol. XXVI, n. 23, 2006, pp. 6314-6317.

[3] See E.A. MAGUIRE, D.G. GADIAN, I.S. JOHNSRUDE, C.D. GOOD, J. ASHBURNER, R.S.J. FRACKOWIAK, C.D. FRITH, *Navigation-related Structural Change in the Hippocampi of Taxi Drivers*, in: «Proceedings of the National Academy of Sciences of the United States of America», vol. XCVII, n. 8, 2000, pp. 4398-4403.

[4] L.S. VYGOTSKIJ, *Thinking and Speech* (1934), in: L.S. VYGOTSKIJ, *The Collected Works of L.S. Vygotskij*, vol. I, edited by R.W. RIEBER, Plenum, New York 1987, pp. 39-285, here p. 50.

[5] L.S. VYGOTSKIJ, *Infancy* (1932), in: L.S. VYGOTSKIJ, *The Collected Works of L.S. Vygotskij*, vol. V, edited by R.W. RIEBER, Plenum, New York 1998, pp. 207-241, here p. 227.

[6] L.S. VYGOTSKIJ, *Thinking and Speech* (1934), cit., p. 49.

[7] L.S. VYGOTSKIJ, *Early Childhood* (1932), in: L.S. VYGOTSKIJ, *The Collected Works of L.S. Vygotskij*, vol. V, cit., pp. 261-281, here p. 269.

[8] See A. POBLANO, T. VALADÉZ-TEPEC, M. ARIAS, F. GARCÍA-PEDROZA, *Phonological and Visuo-Spatial Working Memory Alterations in Dyslexic Children*, in: «Archives of Medical Research», vol. XXXI, n. 5, 2000, pp. 493-496.

[9] See D. MENGHINI, G.A. CARLESIMO, L. MAROTTA, A. FINZI, S. VICARI, *Developmental Dyslexia and Explicit Long-term Memory*, in: «Dyslexia. An International Journal of Research and Practise», vol. XVI, n. 3, 2010, pp. 213-225.