

ADHD Diagnosis from the Perspective of Cultural-Historical Neuropsychology

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The diagnosis of Attention-Deficit/Hyperactivity Disorder (ADHD) has been a subject of enduring debates, with numerous discussions challenging its validity and questioning the evidence that supports its existence. This paper thoroughly examines the ADHD debate by utilizing the lens of cultural-historical neuropsychology. This particular framework is deeply rooted in the cultural-historical theory developed by prominent scholars such as Vygotsky, Luria, and Leontiev. The paper briefly presents the theoretical principles of cultural-historical neuropsychology and continues with a discussion of the development of attention from the perspective of cultural-historical theory. It critically discusses the symptoms of ADHD and illustrates the comparative advantages of cultural-historical neuropsychology. It strongly advocates for a paradigm shift from the traditional diagnostic approach to one based on cultural-historical neuropsychological principles. This shift is said to offer a more personalized, explanatory, and holistic perspective that is better equipped to address and understand the challenges associated with ADHD. This framework considers the unique needs of each child, providing a comprehensive and tailored approach to their specific circumstances.

Keywords: Attention-Deficit/Hyperactivity Disorder, ADHD, diagnosis, cultural-historical theory, cultural-historical neuropsychology.

For citation: Koutsoklenis A., Solovieva Y., Quintanar-Rojas L. ADHD Diagnosis from the Perspective of Cultural-Historical Neuropsychology. *Kul'turno-istoricheskaya psikhologiya* = *Cultural-Historical Psychology*, 2025. Vol. 21, no. 1, pp. 93–101. DOI: <https://doi.org/10.17759/10.17759/chp.2025210110>

Диагностика СДВГ с позиций культурно-исторической нейропсихологии

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Диагноз синдрома дефицита внимания и гиперактивности (СДВГ) был предметом постоянных дискуссий, при этом многочисленные дискуссии оспаривали его обоснованность и ставили под сомнение доказательства, подтверждающие его существование. Эта статья тщательно исследует дебаты о СДВГ, используя призму культурно-исторической нейропсихологии. Эта конкретная концепция глубоко укоренена в культурно-исторической теории, разработанной такими выдающимися учеными, как Выготский, Лурия и Леонтьев. В статье кратко излагаются теоретические основы культурно-исторической нейропсихологии и продолжается обсуждение вопросов развития внимания с позиций культурно-исторической теории. Критически обсуждаются симптомы СДВГ и иллюстрируются сравнительные преимущества культурно-исторической нейропсихологии. Авторы решительно выступят за смену парадигмы от традиционного диагностического подхода к подходу, основанному на культурно-исторических нейропсихологических принципах. Утверждается, что этот подход обеспечивает более персонализированную, объяснительную и целостную перспективу, которая лучше подходит для решения и понимания трудностей, связанных с СДВГ. Эта система учитывает уникальные потребности каждого ребенка, предлагая комплексный и индивидуальный подход к его конкретным обстоятельствам.

Ключевые слова: синдром дефицита внимания и гиперактивности, СДВГ, диагноз, культурно-историческая теория, культурно-историческая нейропсихология.

Для цитаты: Куцокленис А., Соловьева Ю., Кинтанар Рохас Л. Диагностика СДВГ с позиций культурно-исторической нейропсихологии // Культурно-историческая психология. 2025. Том 21. № 1. С. 93–101. DOI: <https://doi.org/10.17759/10.17759/chp.2025210110>

Introduction: The ADHD debate

The diagnosis of Attention-Deficit/Hyperactivity Disorder (ADHD) has faced scrutiny from ontological, epistemological, and axiological perspectives since its introduction in the second edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1968 by the American Psychological Association (APA) [22]. The DSM is considered the gold standard for psychiatric diagnoses used in research, policy and practice, and is the most globally accepted diagnostic classification manual [22]. Consequently, it is justifiable to argue that the DSM represents the prevailing view on ADHD. The contemporary notion of ADHD within the DSM characterizes it as a complex, multifactorial neurodevelopmental disorder [2].

However, the legitimacy of ADHD as a diagnostic entity remains a contentious issue, and the evidence remains inconclusive, sparking intense debates both within and outside the field of psychiatry. One primary line of critique questions the validity of childhood ADHD as a diagnosis. This contention arises on various grounds, including the absence of cognitive, metabolic, or neurological markers and the lack of medical tests [41]. Additionally, it is debated due to the inaccuracies in the diagnostic criteria [20; 26], high rates of comorbidity [17], subjectivity in distinguishing normal behaviors from pathological ones [27], variability within populations [23], differences in diagnosis across gender [14], socioeconomic class [4], and diagnostic disparities based on race and ethnicity [61; 42].

From cultural-historical theory to cultural-historical neuropsychology

Cultural-historical theory is founded on the theoretical contributions of Lev S. Vygotsky (1896–1934), Alexander R. Luria (1902–1977), and Aleksei N. Leontiev (1903–1979). The subject matter of Cultural-historical psychology revolves around the cultural and historical theory of the development of higher psychological functions. Cultural-historical psychology recognizes the cultural origin not only of human psychological activity but also of the brain's functional systems that underlie this activity [32]. Cultural-historical neuropsychology shares the same theoretical principles with Cultural-historical psychology concerning the cultural and historical origin of psychological processes and their systemic structure [55]. The difference lies in the fact that cultural-historical neuropsychology focuses on how higher psychological functions are related to the brain. Examples of such studies encompass the examination of the functional system of speech production and comprehension and of writing [30; 29] and the functional system of reading [43; 44].

The development of attention from the perspective of cultural-historical theory

According to Cultural-historical theory, isolated psychological functions are theoretical constructions with no specific psychological reality. Vygotsky [59] proposed that all psychological functions constitute complex psychological systems and should not be studied in isolation. Vygotsky [57] also argued that studying isolated psychological processes lacks meaning, and each process should only be examined as a component of more complex system. All psychological processes may undergo dialectical transformations during ontogenetic development. For instance, during the developmental process, attention becomes voluntary, mediatized and may later become internalized [57]. Such transformation is neither unique nor spontaneous, meaning it may not necessarily occur automatically, representing only a possibility in the cultural development of a child. Each child progresses through complex and lengthy stages of cultural development, before acquiring speech and logical knowledge.

Building on Vygotsky's ideas, Luria [31] proposed a definition of human psychological processes that distinguished them from those in animals. Human psychological functions are cultural in origin, mediated¹ in structure and voluntary in operation. This perspective allows for the study of psychological processes within a complex functional structure, and it was suggested that this structure is human activity [28]. Each activity is directed towards a cultural objective and is influenced by a cultural object or motive of the activity. Various types of cultural activities are formed during ontogenetical

development, such as play activity during preschool age and learning activity during school age [58; 44].

For instance, in the context of attention, the function of attention is explained with the help of another functions, such as motivation, perception, intellect, consciousness or even movement [25]. Attention should be studied as an integral element in every human activity. This element is referred to as external control [25]. The child may control their actions using external means, such as toys, objects, drawings, or speech. Speech can be both external and internal. The child may acquire the function of control only through the of adult's constant control of the child's productive actions; otherwise, no form of control would spontaneously develop.

Initially, the child is guided by the adult's external speech, which is directed to the child's action goal [59; 33]. Later, during the schooling period, the child may develop the ability to control their intellectual actions through internalized speech. In this case, it can be said that the child has acquired attention. The function of attention is always the function of self-control [25]. The element of control in each cultural action (playing, reading, writing, drawing, and so on) can be either external or internal, and attention can be understood as an internalized level of external control or as internal self-control.

'ADHD symptoms' from the perspective of cultural-historical neuropsychology

According to Luria's proposal, different functional brain mechanisms might be studied as elements of a complex functional system [21]. Each functional system includes the elements of assuming the future result of the action (the objective of the action), efferent control of the execution of the action, afferent analysis, synthesis of external or internal information and the possibility of correction of the action [28]. A brain functional system includes the mechanisms of regulation and control, sequential organization of movements and actions, afferent kinesthetic analysis and synthesis, spatial simultaneous perception, and general activation of cortical activity. Vygotsky [58] presented some important ideas for clinical diagnosis, during which profound causes, instead of external manifestations of symptoms, should be discovered by a specialist. Only qualitative approach for both levels of psychological and neuropsychological assessment may discover the reasons for the child's developmental difficulties and point out the ways for adequate correction.

Such perspectives are rarely taken into account when a child is diagnosed with ADHD. The label substitutes the necessity of identifying the reason for the difficulty, and the name of the disorder is considered sufficient to explain all the symptoms. According to the cultural-historical approach, neuropsychological assessment is understood as a specifically organized qualitative interaction between an adult and a child, during which the

¹ We prefer the term 'mediatized' rather than the term 'mediated' because the latter overemphasizes the adult's role and participation.

child is asked and induced to fulfill different tasks. Each task represents a complex functional system (for example, drawing a house or writing a sentence by dictation), so that the specialist may find and determine the difficulties related systemically to one general factor or brain mechanisms of the syndrome [32].

As we have previously stated, cultural-historical neuropsychology does not study or assess the process of attention in isolation. The process of neuropsychological assessment allows us to establish strong and weak components of functional system of an activity, which accessible to the child at each specific psychological age (preschool or school age) [44]. In the case of ADHD diagnosis, previous studies [e.g. 5; 33] did not identify only one type of brain functional mechanisms or brain structures, responsible for the child's difficulties. Among such different mechanisms assessed in students of different ages and grades (preschool, primary, secondary school), the mechanisms of regulation and control, motor sequential organization of movements and actions, general brain activation and spatial functions were frequently determined as the reasons for children's difficulties and low success in learning activities [52].

Qualitative assessment of children with diagnosis of ADHD allows to find different mechanisms, responsible for the child's difficulties [53]. Children may have complex systemic difficulties and receive a diagnosis of ADHD, but in different cases, these difficulties would be completely different [45; 49]. Such differences require a differential approach for correction and development at different psychological ages [46; 52]. It is also important to stress that brain functional mechanisms are not related to only one brain level or brain zone. Luria's conception of dynamic, hi-

erarchic and systemic representation of functional systems changes during ontogenetic development, realized during cultural activities with different level of automatization of actions [50]. Table 1 shows examples of different brain mechanisms that might be responsible for 'symptoms' as presented in the mainstream ADHD diagnosis.

Data presented in Table 1 is based on clinical experience of the authors and previous studies. These studies implemented the method of qualitative neuropsychological assessment and EEG recording, and pointing out the possibility of the participation of different levels of maturation of brain regulation cortical and subcortical systems in samples of Russian and Mexican children and adolescents of varying ages [16; 33; 34; 47; 48; 52]. Cases of children with a diagnosis of ADHD and no kind of systemic difficulties during qualitative neuropsychological assessment and no evidence of any compromised brain level according to EEG were also found [51].

Table 1 presents known variants of the combination of traditional diagnosis of ADHD with the data of qualitative neuropsychological assessment and EEG methods. These brain levels of organization are not taken into account by mainstream views on ADHD. In contrast, ADHD is considered as a unique clinical picture that does not allow the understanding of real brain mechanisms that lead to the difficulties of the child. The process of correction and development is substituted by medication, the use of behavior conditioning or training of executive functions [3]. No specific proposals according to the age or educational level of the child are usually provided; the same treatment and recommendations are applied to all cases according to the ADHD label.

Table 1

Brain functional mechanisms that are responsible for the children's' difficulties

Functional mechanisms	Possible brain anatomic level	Possible age of children
Regulation and control	Fronto-thalamic system of regulation	Preschool age (5 – 7), school age (7–12), adolescence (12–15)
	Medial structure of brain stem	Preschool age (5–7), school age (7–12)
	Basal ganglia	Preschool age (5–7), school age (7–12)
	Limbic system	Preschool age (5–7), school age (7–12)
Sequential organization of movements and actions	Fronto-thalamic system of regulation	Preschool age (5–7), School age (7–13)
	Basal ganglia	Preschool age (5–7), School age (7–13)
Spatial functions (spatial analysis and synthesis)	Posterior cortical associative and subcortical zones (TPO)	School age (7–13)
	Low brainstem, reticular system	Preschool age and initial period of school age (5–8)
General level of activation	Brainstem, reticular system	Preschool and school age
	Medial structure of brain stem	Preschool and school age
	Limbic system	Preschool and school age
Afferent kinesthetic analysis and synthesis	Parietal cortical and subcortical lobe	Adolescents

Comparative advantages of cultural-historical neuropsychology

1. Provides explanations for behaviors

In the latest edition of DSM, the APA conceptualized ADHD as “a neurodevelopmental disorder defined by impairing levels of inattention, disorganization, and/or hyperactivity-impulsivity. Inattention and disorganization entail inability to stay on task, seeming not to listen, and losing materials necessary for tasks, at levels that are inconsistent with age or developmental level. Hyperactivity-impulsivity entails overactivity, fidgeting, inability to stay seated, intruding into other people’s activities, and inability to wait— symptoms that are excessive for age or developmental level” [2, p. 37]. This definition retains the circular logic of the previous edition, which is “if A then B, and if B then A” translated to “if an individual has attention deficit hyperactivity disorder it is because he is inattentive, disorganized and hyperactive-impulsive, and if an individual is inattentive, disorganized and hyperactive-impulsive it is because he has ADHD”. However, without concrete and objective evidence of an identifiable brain disorder there is nothing that explains behaviors associated with ADHD diagnosis.

DSM-5-TR represents a descriptive approach to diagnosis. DSM utilizes behavioral indicators that are considered sufficient for the diagnosis — there is no necessity to understand or identify any presumed underlying causes or dynamics [40]. These behavioral indicators are simultaneously called symptoms and ‘diagnostic criteria’. These criteria constitute the essence of descriptive diagnosis since they form the basis for the definitions of disorders and the scientific validity of the classification system [24]. On the contrary, Cultural-historical neuropsychology favors *explanatory* models and principles instead of *descriptive* models and principles [55]. In Cultural-historical theory, to explain means to explain causally [56]. Cultural-historical neuropsychology has formulated the understanding of the brain bases of human activity at the level of humans’ brain functional systems [31]. It allows the identification of precise functional brain sources responsible for the child’s difficulties, such as the specific brain factors mentioned above (see Table 1). The concept of functional brain systems helps to understand and explain the various possibilities of the reasons for difficulties. Such reasons might depend on functional deficits of different neuropsychological factors, such as regulation and control, general brain activation, spatial functions, and so on. Subsequently, neuropsychological assessment is not preoccupied with the description of behavioral symptoms but with the identification of the factors that are the reasons for the manifestation of these symptoms. To sum up, Cultural-historical neuropsychology is focused on identifying and explaining the deeper reasons for the behavior, not on naming the behavior itself.

2. Negates the arbitrary homogenization of a *de facto* heterogenous population

The population of children diagnosed with ADHD is very diverse [23]. This diversity is expected, as the

ADHD diagnostic category includes three sub-categories [2, p. 70]:

F90.2 Combined presentation: If both Criterion A1 (inattention) and Criterion A2 (hyperactivity-impulsivity) are met for the past 6 months.

F90.0 Predominantly inattentive presentation: If Criterion A1 (inattention) is met but Criterion A2 (hyperactivity-impulsivity) is not met for the past 6 months.

F90.1 Predominantly hyperactive/impulsive presentation: If Criterion A2 (hyperactivity-impulsivity) is met and Criterion A1 (inattention) is not met for the past 6 months.

This means that children diagnosed with “Predominantly inattentive presentation” may not share common “symptoms” with children diagnosed with “Predominantly hyperactive/impulsive presentation” or share only a few of them. Even for the children diagnosed with the “Combined presentation” there are many possible combinations of symptoms that lead to very different profiles. All the different symptoms mentioned above are considered to derive from a neurological cause. However, this cause has not been defined yet, as admitted by the American Psychiatric Association itself [2].

The heterogeneity of the population of children diagnosed with ADHD is also documented in the high rates of ‘comorbid’ diagnoses. Data from the National Survey of Children’s Health show that nearly two-thirds (63.8%) of children diagnosed with ADHD had at least one current co-occurring condition [12]. Examples of high prevalent ‘co-morbid’ conditions include autism spectrum disorders and learning disorders [17].

Cultural-historical neuropsychology rejects the arbitrary inclusion of diverse children under one diagnostic entity. Firstly, Cultural-historical neuropsychology acknowledges that externally similar behaviors may rely on different psychological processes (that are not possible to be observed directly), and that externally different behaviors may stem from common underlying processes. Hence, it aims to identify the processes responsible for the particular observed behaviors through a structural analysis of the symptom under investigation. This means that a neuropsychological syndrome is not understood as a mere combination of symptoms in Cultural-historical neuropsychology, but it represents instead a selective defect of groups of psychological functions, whose structure includes the same damaged factor with the conservation of other functions that do not include this factor. Cultural-historical neuropsychology aims to reveal the reasons that lie behind the symptoms and not simply sum them up and label them with an arbitrary diagnostic term.

3. Avoids the medicalization of children’s behavior

Sociological approaches to ADHD focus on the social and historical contexts that shape the understanding of ADHD. ADHD (and its diagnostic predecessors such as hyperkinetic disorder and ADD) has had a central position in sociological research concerning the medicalization of human behavior [e.g. 9]. An ADHD diagnosis does not project a value-neutral self-image for labeled as

such. Despite the fact that an ADHD label may provide access to resources, it simultaneously distances individuals from ‘normalcy’ [21]. Stigmatization due to ADHD takes different forms, including public stigmatization, stigmatization by authorities, and courtesy stigma [37].

As stated above, Cultural-historical neuropsychology does not have the goal of labelling children, and thus it avoids the medicalization of children’s behavior. In Cultural-historical neuropsychology impulsive, inattentive and hyperkinetic behaviors are not considered symptoms of a neurological disorder per se. It follows that children who exhibit such behaviors are not considered sick or to have a brain disorder. In this manner, Cultural-historical neuropsychology avoids exposing children to the negative side effects of drug treatments, which include – but are not limited to – death, cardiac problems, psychotic disorders, reduced appetite, difficulty sleeping, and abdominal pain [40]. This is particularly important given how widespread the use of pharmaceutical interventions is becoming [12; 39].

4. Deploys research methodology that allows for explaining behavior at the individual level

The mainstream view on ADHD subscribes to evidence-based practice. Evidence-based practice has derived from its parent movement, evidence-based medicine [18]. In the case of ADHD, the literature promoting evidence-based practice privileges specific types of evidence produced by experimental research, particularly from randomized control trials (RCTs). The following statement by the European ADHD Guidelines Group is very representative: ‘Randomized-controlled trials (RCTs) remain the gold standard to assess the efficacy, effectiveness, and safety of interventions’ [8, p. 1338]. However, RCTs implement group-aggregated averages in the data analysis. Therefore, by default, their intention is not to explore the particular needs of specific individuals in their settings [18].

Cultural-historical neuropsychology avoids the pitfall of the aforementioned ‘ecological fallacy’. In contrast, it deploys research methods that aim to reveal the processes that are hidden from direct observation and which underlie such behavior [54]. Explanation is achieved with the structural-systemic description of the studied phenomenon. Therefore, the investigation of observable behavior cannot be sufficient in cultural-historical neuropsychology because observable behavior is not in direct correspondence with non-observable psychological processes that underlie it [54].

5. Avoids the complex educational negative effects of labeling

The ADHD label is closely related to stigmatization in educational settings [19]. Children and adolescents diagnosed with ADHD may perceive their diagnosis negatively [36; 60]. and recall childhood memories of mistreatment, discrimination, or misunderstanding due to the diagnosis [21; 60].

The complexity of the effects of the ADHD label is evident in several studies. For example, [38] provided

school teachers and education students with vignettes describing children who met ADHD criteria that included or did not include the label ‘ADHD’. Participants were asked to rate their reactions towards the children’s behavior. They found that ADHD-labeled vignettes elicited greater perceptions of the child’s impairment, along with more negative emotions and less confidence in the participants; however, they also found an increase in the participants’ willingness to implement interventions for the labeled children [38]. In another study that used vignettes [15] it was found that the ADHD label general triggered essentialist beliefs among teachers. Labeling is not an objective in Cultural-historical neuropsychology, nor is it a prerequisite for effective intervention. By focusing its procedures on explaining rather than naming, Cultural-historical neuropsychology avoids exposing children to the complex effects of labeling.

6. Acknowledges that inattentive, impulsive and hyperkinetic behaviors may be attributed to reasons other than neuropsychological factors

Cultural-historical neuropsychology acknowledges that not all inattentive, impulsive, and hyperkinetic behaviors are related to neuropsychology. It recognizes that socio-economic factors can contribute to a child’s display of inattentive, impulsive,

and hyperkinetic behaviors. For example, Choi et al. [6] found that children living in decreasing, consistently low, and consistently mid-low-income households had an increased risk of being diagnosed with ADHD compared children who stably lived in a mid-high-income household. Cultural-historical neuropsychology also acknowledges that attention difficulties may be related to emotional development and the child’s achievement of a healthy self through emotional investments in relationships, and identity, and self-coherence [10]. Children who have received the ADHD diagnosis often experience a great deal of difficulties in interpersonal relationships stemming from problematic parental and sibling interactions, parental overinvolvement and abandonment, trauma, and narcissistic vulnerabilities [7; 11]. Cultural-historical neuropsychology may also help differentiate neuropsychological syndromes from other non-neuropsychological reasons that lead to ADHD related difficulties, such as social isolation or traditional, ineffective teaching techniques.

7. Acknowledges the teacher as an active collaborator

Evidence-based practices are considered the gold standard of mainstream approaches to ‘ADHD’ assessment and intervention. According to the mainstream perspective, a notable advantage of these interventions is their potential for standardization. This means they can be manualized and presented to teachers as a protocol with clearly defined steps.

[25]. These interventions aim to neutralize the impact of individual teachers on the effectiveness outcomes. Such an approach reduces the teacher to a follow-

er who needs to ‘follow the book’ to faithfully execute the instructions of the manual [25]. Furthermore, the guidelines are directed towards ‘children with ADHD’ in general and not to a particular individual child. However, for interventions to be effective, they must be contextualized and tailored to the unique and specific needs of individual children.

Cultural-historical neuropsychology addresses both of these issues. On one hand, it encourages active collaboration between teachers and neuropsychologists (as seen in examples provided in 44). Suggestions stemming from cultural-historical neuropsychology can be beneficial for individualized instruction (in a one-on-one setting) and for differentiated instruction (in a whole-class setting). On the other hand, the outcomes of cultural-historical neuropsychology are inherently customized for each child, influencing recommendations for school-based interventions. These interventions are not structured around the diagnosis but are solely based on the findings of the neuropsychological assessment. Consequently, there is no intermediate level of abstraction (in the form of a diagnosis) that mediates between assessment and intervention; a tailor-made assessment leads directly to personalized intervention recommendations for the specific child.

Concluding remarks

To summarize, the discussion surrounding ADHD is intricate and multifaceted, encompassing ontological, epistemological, and axiological perspectives. While the prevailing view, as represented in the DSM, characterizes ADHD as a neurodevelopmental disorder, it remains a subject of debate, with numerous critiques challenging its validity and the implications of its application. Cultural-historical neuropsychology offers a distinctive perspective on attention and related difficulties, drawing from the rich theoretical tradition of cultural-historical theory. This approach views ADHD not as a monolithic condition but emphasizes the developmental nature of attention, highlighting how attention evolves from external to internal control within the context of cultural activities. In essence, cultural-historical neuropsychology provides a comprehensive framework for understanding and addressing the factors associated with the diagnosis of ADHD. It transcends the limitations of categorical diagnosis by focusing on explanatory models, individual needs, and collaboration among educators and specialists. As we continue to navigate the complexities of the ADHD diagnosis, this perspective offers a valuable pathway toward more effective support for children.

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Получена 15.07.2024

Принята в печать 14.03.2025

Received 15.07.2024

Accepted 14.03.2025