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BEYOND THE NEURODEVELOPMENTAL DISORDERS:
repercussions for childhood and education

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ABSTRACT
The publication of DSM-5 in 2013, although marked by a series of critics, had introduced a new chapter, entitled “Disorders of Neurodevelopment”, which was received as a kind of promise in contemporary psychiatry. The broader logic concerning this diagnostic group, when encompassing a series of conditions initiated in childhood under the aegis of an etiopathogenesis linked to neuronal development, points to new directions in the field of psychiatry, such as the Rdoc project. This paper aims to present, through selected bibliography, the neurodevelopmental perspective linked to the rise of the chapter “Neurodevelopmental Disorders”, seeking to trace correlations with the phenomena of neuroculture, neuroidentities and neurodiversity, as well as to identify the notions of normality and pathology implicit in this logic. In addition, some consequences of this paradigm are pointed out in the context of childhood and education. The social ideals linked to the notions of competence and agency have reconfigured the perception of contemporary childhood, associating it with values such as autonomy and adaptability, making the distinction between children and adults less marked. These values are in line with the notion of neurodevelopment, as both imply a trajectory of constant change, reconfiguration and lifelong learning. The field of education is affected by this discussion, being invaded by brain metaphors around neuroplasticity that, associated with the emphasis on entrepreneurship and risk management, lead to shifts in the identity of contemporary children and adolescents.
Keywords: Neurodevelopment. Psychiatry. Childhood. Education.

MÁS ALLÁ DE LOS TRASTORNOS DEL NEURODESAROLLO:
repercusiones para la infancia y la educación

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RESUMEN
La publicación de DSM-5 en 2013, aunque marcada por una serie de críticas, introdujo un nuevo capítulo, titulado "Trastornos del neurodesarrollo", que fue recibido como una especie de promesa de la psiquiatría contemporánea. La lógica más amplia articulada a este grupo de diagnóstico abarca una serie de afecciones iniciadas en la infancia bajo los auspicios de una etiopatogenia vinculada al desarrollo neuronal y apunta a nuevas direcciones en el campo de la psiquiatría, como el proyecto Rdoc. El objetivo de este artículo es presentar, a través de bibliografía seleccionada, la perspectiva del neurodesarrollo articulada al surgimiento de los "trastornos del neurodesarrollo", buscando rastrear correlaciones con los fenómenos de la neurocultura, neuroidentidades y neurodiversidad, así como identificar las nociones de normalidad y patología implícitas en esta lógica. Además, se señalan algunas consecuencias de este paradigma en el contexto de la infancia y la educación. Se puede ver que los ideales sociales vinculados a las nociones de competencia y agencia han reconfigurado la percepción de la infancia contemporánea, asociándola con valores como la autonomía y la adaptabilidad, haciendo que la distinción entre niños y adultos sea menos marcada. Estos valores están en línea con la noción de neurodesarrollo, ya que ambos implican una trayectoria de cambio constante, reconfiguración y aprendizaje permanente. El campo de la educación se ve afectado por esta discusión, siendo invadido por metáforas cerebrales en torno a la neuroplasticidad que, asociadas con el énfasis en el espíritu empresarial y la gestión de riesgos, conducen a cambios en la identidad de los niños y adolescentes contemporáneos.
Palabras clave: Neurodesarollo. Psiquiatría. Infancia. Educación.

MAIS ALÉM DOS TRANSTORNOS DO NEURODESENVOLVIMENTO: desdobramentos para a infância e a educação

RESUMO
A publicação do DSM-5 em 2013, embora marcada por uma série de críticas, introduziu um novo capítulo, intitulado de “Transtornos do neurodesenvolvimento”, que foi recebido como uma espécie de promessa da psiquiatria contemporânea. A lógica mais ampla articulada a este grupo diagnóstico, ao abarcar uma série de quadros iniciados na infância sob a égide de uma etiopatogênese ligada ao desenvolvimento neuronal, aponta para novos direcionamentos no campo da psiquiatria, tal como o projeto Rdoc. O objetivo deste artigo é apresentar, por meio de bibliografia selecionada, a perspectiva neurodesenvolvimentista articulada à ascensão dos “Transtornos do neurodesenvolvimento”, procurando traçar correlações com os fenômenos da neurocultura, neuroidentidades e neurodiversidade, bem como identificar as noções de normalidade e patologia implícitas nessa lógica. Ademais, apontam-se algumas consequências desse paradigma no âmbito da infância e da educação. Pode-se perceber que os ideais

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sociais ligados às noções de competência e agência têm reconfigurado a percepção da infância contemporânea, associando-a a valores como autonomia e adaptabilidade, tornando a distinção entre crianças e adultos menos marcada. Esses valores estão em sintonia com a noção de neurodesenvolvimento, na medida em que ambos implicam uma trajetória de constante mudança, reconfiguração e aprendizagem ao longo da vida. O campo da educação é afetado por essa discussão, sendo invadido por metáforas cerebrais em torno da neuroplasticidade que, associadas à ênfase no empreendedorismo e do manejo de riscos, levam a deslocamentos na identidade da criança e do adolescente contemporâneos.
Palavras-chave: Neurodesenvolvimento. Psiquiatria. Infância. Educação.

Introduction

The publication of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), in 2013, received wide criticism. As Costa (2014) points out, far from having been a triumph of the systematic diagnostic conventions in psychiatry, the DSM-5 ended up exposing a fundamental epistemological fracture in this discipline. Just before this manual was released, a post entitled 'Transforming Diagnosis' on the institute's official blog was published by Thomas Insel, director of the US National Institute of Mental Health (NIMH). According to Insel (2013), the DSM diagnostic categories, based on sets of clinical symptoms and not on objective laboratory measures (as in other areas of medicine), would not have scientific validity. Therefore, the RDoc (Research Domain Criteria) project was presented as alternative to promote the investigation of mental disorders linked to the biological apparatus. According to Zorzanelli, Dalgalarrondo and Banzato (2014), the sense of validity adopted by Insel (2013) relates to a defined biological inscription, given his assumption that mental illnesses are disorders that involve brain circuits related to specific domains such as cognition, emotion and behavior.

The scenario, however, is different in relation to a chapter presented for the first time in the fifth edition of the manual: "Neurodevelopmental Disorders". The advent of this group in 2013 marks the disappearance of the section "Disorders usually evident for the first time in childhood and adolescence", in previous editions since DSM-III (APA, 1980). Allocated at the beginning of the Manual, whose

organization would reflect “a chronological approach to the life cycle” (APA, 2013:13), neurodevelopmental disorders group “Intellectual deficiencies”, “Communication disorders”, “Specific disorder of learning”, “Motor disorders” “Attention-deficit / hyperactivity disorder” (ADHD) and the “Autism spectrum disorders”. In the same direction, ICD-11, published in 2018, renamed what in ICD-10 was the chapter “Mental and Behavioral Disorders” to “Mental, Behavioral and Neurodevelopmental Disorders” (Chapter 6 – 6 A00 – 6 E6Z).

The chapter “Neurodevelopmental Disorders” was not received with the same discontent shown in relation to DSM-5 as a whole; on the contrary, it encompasses a broader logic configured as a kind of promise of contemporary psychiatry when embracing diagnoses aimed at childhood under the aegis of an etiopathogenesis linked to neuronal development. Cassey, Olivieri and Insel (2014), for example, indicate that the neurodevelopmental perspective meets the recent guidelines of the NIMH, more specifically the Rdoc project, which aims to provide a new guideline in research, distant from symptomatological descriptions and promising more validity and reliability than the existing classifications. This chapter, therefore, condenses the project of contemporary psychiatry supported by converting it – at least in part – into “developmental psychiatry” (EME, 2017).

The neurodevelopmental perspective is based on a notion of long-term development, which begins in early childhood (sometimes in intrauterine life) and extends into adulthood – a logic that implies the displacement of the modern notion of development understood as a pre-established trajectory and based mainly on the idea of evolution. When associated with notions of biology such as epigenetics and brain plasticity, neurodevelopment refers to an erratic and constantly changing process. As Nestler (2009) points out, the articulation of mental pathologies with neurodevelopmental disorders makes up a scenario in which the pathology gains a chronic, slow and progressive character. Furthermore, under this bias, there is a defense of the need to understand mental pathologies from a quantitative difference of normal development (in the sense of excesses or deficits), highlighting the longitudinal dimension.

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The neurodevelopmental logic goes beyond the chapter on neurodevelopmental disorders and updates the discussion around the figure of the "cerebral subject" (EHRENBERG, 2009; VIDAL, 2005; VIDAL & ORTEGA, 2017) and, in a broader aspect, "neuroculture" (ORTEGA, 2009). This is because, by circumscribing the criteria of normality and pathology linked to neural development, this perspective helps to produce in the social imagination the perception of the brain as the holder of properties, the author of actions and the main raw material of personal identity, understood as brain identity. As Ortega (2009) points out, the cerebral subject is linked to the formation of neuroidentities, that is, ways of circumscribing identities based on neurobiology.

In view of these considerations, this article aims to present in more detail the neurodevelopmental perspective linked to the rise of the chapter "Neurodevelopmental Disorders" in DSM-5 and to identify the notions of normality and pathology concerning this logic. It also seeks to circumscribe some correlations with the phenomenon of the production of neuroidentities (such as the neurodiversity movement), pointing out the consequences of this paradigm in the field of childhood and education.

1. Neurodevelopment and contemporary psychiatry

The articulation between psychiatry and development is not new – Foucault (2001), for instance, states that psychiatry is born linked to an ideal of modern development. Roughly speaking, this notion is anchored in outlined phases unfolded in a serial and cumulative time – the concept of evolution is central. However, in recent years, the radical "neuro" allocated to this word seems to promote important displacements in relation to a pre-established trajectory that characterizes the modern conception of development. We do not intend, however, to consider neurodevelopment as an evolution of the concept of modern development, but as a notion that includes lines of continuity and difference. In addition to a previously defined trajectory, its articulation with discussions of biology as of epigenetics and brain plasticity refers to an erratic and constantly changing process, differentiating

itself from an evolutionary trajectory with stages outlined beforehand. Also, this path of constant change begins in childhood, but extends to the adult: a cut between these two poles cannot be accurately seen.

In general, the rise of the chapter “Neurodevelopmental disorders” in DSM-5 (APA, 2013) involves a logic that has important consequences for contemporary psychiatry. In this chapter there is a large part of the affections previously belonging to the group destined for childhood or considered as often started in childhood. According to Lima (2020a), with this section, a kind of “disappearance of childhood” is configured in the DSM-5, completed with the dispersion of other childhood diagnoses allocated in the same category of “adult” disorders. Given this situation, there is a shift in psychiatry from pathologies linked to the transient developmental delay located in childhood to a neurodevelopmental perspective that crosses the life cycle.

It should be noted that the rise of this chapter involves a certain line of continuity with the paradigm shift consolidated in the publication of DSM-III in 1980, insofar as it was intended to be based on an atheistic and descriptive approach that had as its horizon the project of linking the mental pathologies to the biological substrate. This displacement is a driver of what Shorter (1997) called "second biological psychiatry", leveraging the intention of associating mental disorders with neuronal problems. Following the indications of Paris (2013), the issues that drove the changes in 1980 remain in the context of the publication of the DSM-5 (2013), since a biological psychiatry was not consolidated in the third and fourth editions of the manual.

In this context, the chapter “Neurodevelopmental Disorders”, among other aspects, tries to give a destination to these problems and, therefore, concentrates the psychiatry project as a whole – mainly in the way of conceiving the etiopathogeny of mental disorders. Bishop and Rutter (2008) argue that the discussion around neurodevelopment is a consequence of a movement started in the 60s and 70s with the diagnosis “Minimal brain dysfunction”, which intended to allocate different symptoms in a single cerebral etiopathogenesis, distancing itself

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from symptomatic descriptions. The argument used to abandon the chapter on diagnoses usually made in childhood, found on the APA website, seems to corroborate this intention.

The justification for the inclusion of the 'neuro' radical lies mainly in the idea that scientific evidence currently places several disorders, or even most of them, in a spectrum with closely related disorders with shared symptoms, environmental and genetic risk factors, and possibly, shared neuronal substrates (APA, 2013). In the same direction, the editors claim that ADHD was placed in the chapter on neurodevelopmental disorders to reflect its correlates in brain development as well as the decision in DSM-5 to eliminate the DSM-IV chapter that included all diagnoses usually made for the first time in early childhood, childhood or adolescence (APA, 2013). However, in the manual itself, in the description of ADHD, more precisely in the topic "Associated Features Supporting Diagnosis", we find the following:

> No biological marker is diagnostic for ADHD. As a group, compared with peers, children with ADHD display increased slow wave electroencephalograms, reduced total brain volume on magnetic resonance imaging, and possibly a delay in posterior to anterior cortical maturation, but these findings are not diagnostic. In the uncommon cases where there is a known genetic cause (e.g., Fragile X syndrome, 22qll deletion syndrome), the ADHD presentation should still be diagnosed (APA, 2013:61).

It is interesting to note that despite the explicit intention, the grouping around neurodevelopmental disorders, in practice, does not rely on biological markers, which are still absent from psychiatric clinic. Furthermore, the biological hypotheses based on the notion of epigenetics, which, roughly, affirm the interaction between gene and environment at the origin of mental disorders, as well as the notion of brain plasticity, which would point to an erratic path of constant change in brain circuits, are no longer spelled out in this diagnostic manual.

However, even if it is not explicit in the manuals, the neurodevelopmental hypotheses are based mainly on the premise of the interaction between gene and environment, generating biological marks that, in turn, could be delimited as a detectable cause of mental disorders. The radical 'neuro' placed next to the word

'development' appears as a possibility (although not yet consolidated) to bring psychiatry closer to neurology and, thus, bring more biomedical legitimacy to the former. This group, therefore, has been gaining importance in current research, since it promises a horizon in which psychiatry, neurology and the notion of development are inseparably intertwined.

In this context, it is possible to draw a line of continuity between these objectives and the guideline, discussed in the strategic plan of the NIMH since 2008. Its first objective is to promote discoveries in the brain and in behavioral sciences to boost research on the causes of mental disorders (NIMH, 2008). It is also in this context that the project mentioned above, entitled RDoc (Research Domain Criteria), is inserted. It intends to classify mental disorders based on the analysis of genes, cells, neural circuits and, at the limit, promise more etiological validity and reliability than the existing classifications. According to Insel and Quirion (2005), the objective of the decade was the possibility of coincidence between mental illness and brain disorder, suggesting that "the psychiatrist of the future will have to be a brain scientist" (p. 5). The key to forging a path to the brain systems would be precisely to follow the issue of development – as pointed out by Casey, Oliveri and Insel (2014). Neurodevelopmental disorders, therefore, appear to be the point of transition between the DSM-5 and RDoC paradigms.

In addition to the articulation of pathology to neuronal development, neurodevelopmental disorders reveal another important movement in the fifth Manual: the change in the disease classification system, which has ceased to be multi-axial,[1] as it was since 1980, to become categorical-dimensional. Under the dimensional bias, pathology is seen as a continuum of intensity, reducing the imposition of single and definitive cutoff points for a pathological threshold – typical of categorical conception. The chapter "Disorders of neurodevelopment" helps to constitute a longitudinal look at the course of mental disorders, characteristic of the categorical-dimensional perspective, by highlighting an outline that emphasizes the

[1] The third and fourth manuals are divided into five axes. In the fifth manual, through its categorical-dimensional perspective, this division is eliminated.

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life cycle. The diagnoses presented in the chapter that refers to neurodevelopment are not exclusive to childhood – several pathologies included in it, previously privileged in the scope of childhood, are extended to adults, such as ADHD.

Another important aspect is the fact that, in general, the DSM-5 reflects the tendency to conceive mental disorders articulated to a quantitative and continuous difference between normal and pathological, and the discussion about neurodevelopment disorders is central in this context (PARIS, 2013).[2] The intention to circumscribe the pathology as a quantitative variation of normal neural development (understood as a physiological average) is clearly explained by Casey, Oliveri and Insel (2014) when pointing out that one of the most important tasks of the new research guideline at the NIMH is to outline the typical neurodevelopment. Referring to studies in the field of ADHD, the authors state that in relation to normal neurodevelopment:

> [...] the trajectory of neurodevelopment revealed a delay rather than a deficit in cortical maturation, and the most prominent delay - consistent with the characteristic problems of ADHD - was in the prefrontal cortical regions important for the construction of cognitive control (p. 352).

The editors of the manual, in turn, point out that the diagnoses of the neurodevelopment group can be made both in relation to excess and to deficits and delays in reaching the expected milestones, either globally or in relation to specific functions, such as can be seen in this excerpt at the beginning of the chapter:

> The disorders typically manifest early in development, often before the child enters grade school, and are characterized by developmental deficits that produce impairments of personal, social, academic, or occupational functioning. The range of developmental deficits varies from very specific limitations of learning or control of executive functions to global impairments of social skills or intelligence. (APA, 2013, p. 31).

[2] According to Paris (2013), the principle based on the idea that there is a qualitative difference between normality and pathology refers to Kraepelin and remains present in DSM editions prior to DSM-III.

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Although delineating the characteristics of delays and deficits, the DSM-5 does not include a more detailed discussion about which parameters of normality and pathology guide neurodevelopmental disorders: how to better outline the notions of normality and pathology based on a definition that supposes the quantitative difference between these poles? Since the manual does not provide such parameters, it is up to us to carry out this task, in dialogue with the ideas of the philosopher Georges Canguilhem.

2. Neurodevelopment, normality and pathology

The debate on the criteria of normality and pathology in the health field tends to oppose naturalists and normativists. The naturalist perspective, which has Cristopher Boorse as its representative, maintains that the concepts of health and disease are purely descriptive, strictly referring to a biological norm (GIROUX, 2011; ALMEIDA FILHO & JUCÁ, 2002). The goal of naturalists is to show that the distinction between normal and pathological is factual, and what deviates from this pattern is now considered pathological (GAUDENZI, 2014).

Under the normativist prism, the notions of normal and pathological are understood as events dependent on subjective experience, rules and moral values. Normativists are divided between those who claim that value depends on the social judgment through which health standards are developed and those who believe that the value of health is dictated by something inherent in life. Normativity, in the first perspective, has above all a social and cultural nature (GAUDENZI, 2014). As Fulford (2001) points out, what is identified as a disease is dependent on the subjective experience of malaise that occurs in a given social context. The group of symptoms takes on a name and is included in medical classifications, becoming a type of pathology. The second perspective, in turn, concerns the vital normativism defended by Canguilhem (2000), precursor of this paradigm.

It must be noted that in the first part of the book On the Normal and the Pathological, Canguilhem (2000) identifies one of the mistakes in the classic way of understanding the pathological when asking: “Is the pathological state just a

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quantitative variation of the normal state?" (CANGUILHEM, 2000:19). The discussion undertaken by the philosopher culminates in supporting the thesis that considering the abnormal as a simple reduction or addition made over a certain physiological norm is equivalent to converting the continuity between normality and pathology into homogeneity – posture that ends up making the notion of illness meaningless, reduced to a simple variation (for more or for less) of bodily functioning.

Canguilhem (2000) points out, therefore, the impossibility of defining the pathological as quantitative variation and reducing the normal to the statistical average, since for the author it is only in the record of values that the phenomenon of the disease can be understood. In the wake of these ideas, it could be stated that where doctors say there is a quantitative / objective variation, a qualitative / evaluative change is hidden. This veiled aspect is often present, according to Canguilhem (2000), in the appearance of qualitative terms (disorder, disproportion, disharmony) inserted in apparently quantitative discourses (hyper, hypo), without the doctors themselves realizing it.

This ambiguity can be seen in the descriptions of the categories allocated under the umbrella of neurodevelopmental disorders, as well as pointed out in relation to the manual as a whole: words such as deviations and disorders are linked to expressions such as deficits and excesses. Following the use of these expressions, it is interesting to note, from the editors' indications about neurodevelopmental disorders, the patterns against which deficits are considered, such as in this excerpt:

> The deficits result in impairments of adaptive functioning, such that the individual fails to meet standards of **personal independence** and **social responsibility** in one or more aspects of daily life, including communication, social participation, academic or occupational functioning, and personal independence at home or in community settings (APA, 2013, p.31 – emphasis added).

The values used as beacons for what is considered normal are based, therefore, on notions such as personal independence and social responsibility – which, in turn, make everything that limits or excludes them pathological. Still

following Canguilhem's (2000) indications, it is ignored that “the disease is not only the disappearance of a vital physiological order, but the appearance of a new vital order” (p. 156) – which can be understood as difference – but what space does the neurodevelopmental logic allow for difference?

3. Neurodevelopment and neurodiversity

The perspective brought by neurodevelopmental disorders, as discussed so far, implies a context in which mental pathologies are treated as the product of quantitative variations (be they excesses or deficits) of normal neurological development – with values such as independence and responsibility highlighted as a backdrop. background of the discussion. Moreover, as explained earlier, the neurodevelopmental logic, articulated with the chapter “Disorders of neurodevelopment”, seems to be in the wake of a broader context when situating mental pathology at the level of neural development. This paradigm refers to the so-called "strong program" of neurosciences, which aims at the approximation, or even coincidence, of psychiatry and neurology, and is part of a broader movement in which the brain occupies a privileged place in terms of describing subjectivity, which was designated as **neuroculture** (ORTEGA, 2009).

Some factors, such as the progress of neurosciences, the use of neuroimages by the media, among others, help to circumscribe this scenario that places the brain as the owner of the properties and the author of the actions that define the subject. The term "cerebral subject" (EHRENBERG, 2009; VIDAL, 2005; VIDAL & ORTEGA, 2017) points to the belief that the brain is the part of the body that encompasses all personal identity. This discussion is, in turn, referred to what has been designated as bioidentities, that is, a way of building identities based on parameters based on biological corporeality, a context in which the approximation between self and body becomes almost absolute (COSTA, 2004). By privileging the articulation of mental disorders to biological substrates, as in neurodevelopmental disorders, psychiatry and its diagnostic categories have been an important field of formation of bioidentities. As Lima (2005) points out, more specifically in the context

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of ADHD, there is a subtle shift in the experience of **having** the disorder to **being** an ADHD.

In this context we can understand the notion of neurodiversity – in which, paradoxically, identity, uniqueness and difference are based on parameters linked to brain functioning. The term **neurodiversity** was coined by the Australian sociologist and bearer of Asperger's syndrome Judy Singer in 1999 and aims to emphasize that a divergent neural functioning is a difference and not a disease. As well as other differences (such as those of gender, race, creed), from this perspective, bioidentities also contain singularities that must be respected and not essentially pathologized. The neurodiversity movement embraces the paradigm of "disability studies",[3] according to which disability and disease are not biological facts, but sociocultural constructions that aim to regulate bodies and brains (DAVIS, 1995; DINIZ, 2007; ORTEGA, 2009).

An important field in these discussions is made up of people diagnosed on the autistic spectrum, and more specifically the so-called "high functioning" autists – often diagnosed with Asperger's syndrome. The term **disorder** itself has been replaced by **conditions** (of the autistic spectrum), not only in the texts of neurodiversity activists and their associations, but also in the literature itself in the field of cognitivism. For Happé (1999), for example, the characteristics of autistic people would be more equivalent to a style than to a cognitive deficit. Baron-Cohen (2000), on the other hand, maintained that the term **difference** was more appropriate to Asperger's syndrome, as it was more "neutral", "fair" and "devoid of value" than impairment and disability, which would apply only to low functioning autists (LIMA, 2020).

In this context, if the values that support normality, implicit in the supposedly quantitative conception of pathology, are anchored under the precepts of responsibility and independence, the guidelines for neurodevelopmental disorders

[3] This field proposes the division between “impairment” and “disability”. While the first refers to a physical condition, disability refers to a label imposed socially on the individual with an impairment – an impairment a disability based on a socially shared value (ORTEGA, 2009).

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appear to consider pathological everything that escapes this logic – going against the grain of the discussion on neurodiversity. The supposedly quantitative variation ends up being linked to the qualitative difference understood as pathology and not diversity, configuring the disorder from aspects with negative value, such as dependence and irresponsibility.

It is also worth mentioning that this project is not strictly theoretical – after all, we are in the field of medicine and, more specifically, psychiatry. As Bezerra (2014) points out, psychiatry, more than any other medical specialty, is inevitably crossed by two variables that are in constant tension: the poles “knowledge” and “care”. In the context of neurodevelopmental disorders, a new field of study is articulated, of medical practices and interventions in the sense of knowledge about vulnerability to certain diseases. With the etiology of the disease based on the idea of an early onset related to gene-environment interaction, efforts are noted to anticipate and predict pathological outcomes, such as genetic screening, based on the expectation that it is possible to identify in advance individuals prone to falling ill in adulthood. What would be the consequences of this theoretical-clinical perspective for childhood and more specifically at the intersection with the field of education?

4. The government of childhood and contemporary education: entrepreneurship, risk and neurodevelopment

Childhood, taken as a period of onset, but not exclusive, of neurodevelopmental disorders, becomes a particularly illustrative case in this context. This is because, linked to the notion of modern development, childhood was linked mainly to the idea of dependence and care. Modern childhood, according to Wells (2011), was produced by new rationalities and techniques of governmentality[4], which established rules to manage the child's life, rules mainly of

[4] In Foucault's theoretical path, the notion of governability refers mainly to the use of power and the set of norms supported by each type of power, composing specific coercive practices. Thus, different modes of governance stand out, linked mainly to sovereign, disciplinary power and biopower, engendering the development of coercive techniques and distinct knowledge.

a disciplinary nature. In disciplinary societies, power has the function of training through the creation of institutions, such as the school, and the use of instruments, such as the exam. The child who must be cultivated to become an adult is correlated with the birth of school as a means of education. Wells (2011) points out that the emergence of a certain way of conceiving childhood, a mark of modernity, coincides with a way of exercising disciplinary power and moves towards a biopower or a life policy – biopolitics (FOUCAULT, 2001). When life itself becomes the target of technologies of power, children, their gestation, their birth, as well as the outline of their development, which gradually gains a normative character, stand out as objects of governmentality.

As Ferreira and Araújo (2009) point out, in relation to the theme of schooling, this form of governance is implanted in the school domain under the pretext of equality and citizenship. Thus, education is now considered a condition for social progress and a kind of obligation of the State, since it would allow the development of the population towards civilized and educated adults. The public, compulsory and for all school, in addition to a nation project (PATTO, 2000), is engendered by the effort of these new naturalizing management techniques, causing the birth of interest in psychological investigations that will culminate in a series of knowledge about childhood, such as developmental psychology.

Concomitantly with the establishment of institutions to regulate child behavior, there is the configuration of a series of specialists who deal with the way of educating children, as well as the formalization of discipline regimes that should characterize normal development (NADESAN, 2010). The government of childhood life, in this context, aims to circumscribe what can slow or interrupt natural development, in the field of medical or legal knowledge, for example. This process reaches its peak in the first half of the 20th century, when the specificity of childhood is studied by psychiatry, psychoanalysis, psychology, and pedagogy, among others (FERREIRA, 2013).

From the establishment of professionals with knowledge about children, there is a growing splurge about the vulnerability of this period of life. In this context, the

scenario that Nadesan (2010) calls “childhood at risk” is configured. Children, especially those from the upper classes of society, came to be seen, especially from the middle of the 20th century, as at risk in the educational, cultural, and environmental fields, requiring parental care and appropriate institutions from early childhood.

As Nadesan (2010) and Wells (2011) point out, this scenario was significantly reconfigured throughout the second half of the 20th century and especially in the 21st century, which coincides with the shift in the social role of childhood. Nadesan (2010), when dealing with childhood from the perspective of risk and the forms of governmentality directed towards it, points out a reformulation of these practices in the 21st century, mainly in the transition from the social welfare policy to the neoliberal logic. In the health field, the emphasis is shifted from risks in relation to external pathogens to genetic risks, a central issue for the notion of neurodevelopment. According to the author, the market economy is extremely important for the way of elaborating public policies in relation to childhood. In line with what is conventionally called a risk society (BECK, 1992), in which the feeling of insecurity and the need for self-government drive the exercise of incessant self-reflexivity in the search for adequate performance, Nadesan (2010) predicts that conceptions of childhood around characteristics such as dependency and vulnerability will be increasingly challenged by the new economic environment, which, in turn, demands problem solutions towards risk management in an individualized way.

According to Castro (2013), late capitalism installs an important difference in the social position that childhood had been occupying in modern society, triggering a process through which the role of youth and children in culture is constantly redefined. As a consumer, the child was raised to the same status as the adult. Thus, the view that children should wait for a further time to integrate themselves in the social dynamics is dismantled (CASTRO, 2013). Childhood thus began to respond to market needs as a media character in the new capitalist imagination.

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In the field of pharmaceutical industries, it is also possible to observe this logic. According to Angell (2007), the efforts of this segment are mainly directed towards attracting new consumer markets, with childhood being an important target in this process. In addition, it can be said that childhood has an important, if not decisive, role in the logic of extending the patent on medicines. In the USA, for example, if a drug has its use approved by the FDA for children, its patent can be extended up to six months (ANGELL, 2007). This fact drives research on medicines for children and shifts the eyes to this age group, especially in the growing market for psychotropic drugs, which are among the most consumed drugs by American children and adolescents – with emphasis on ADHD drugs (HALES et al., 2018).

This perspective is associated with a broader change in the regime of power: the transition from disciplinary to control society, developed by authors such as Deleuze (1992). As explained earlier, while disciplinary society is characterized by confinement to the interiority of spaces, in control societies, surveillance expands to open spaces. The end of well-defined contours, as well as the walls of institutions, also indicates the blurring of the boundaries between inside and outside, public and private. In the control society, power starts to operate through informational devices, allowing intermittent modulations of bodies. Formation, for example, becomes continuous and permanent: it is no longer a question of following frames, but of continually modulating. According to Chevitarese and Pedro (2005), while the modern norm established a dual logic (in school, for example, “pass / fail”), the contemporaneity presents itself as an infinite and immeasurable horizon of maximizing performances and competences. Today's slogans revolve around flexibility and constant change.

In this context, there is a shift in the developmentalist perspective in discussions around early childhood education. This is because the child is no longer interviewed under the evolutionary bias of a predictable natural development to give way to the perspective that includes a certain performativity and an irregular trajectory. In this same direction, there are mainly discussions around what is conventionally called “skills pedagogy” (RAMOS, 2001) as opposed to the

pedagogical project divided into phases corresponding to the age groups. According to Le Boterf (2003), competence means the possibility of adjusted action in the face of complex, unpredictable, changeable and always singular situations.

A competency-based pedagogy considers the child to be an autonomous and competent subject in relation to the use of knowledge, failing to circumscribe him/her as a being who must go through preformed stages of development. Following the indications of Ramos (2001), this trend consolidates the trend towards liberalized professionalization, based on the principle of individual adaptability to socioeconomic changes. That is, the child can become an autonomous subject of his/her learning and, concomitantly, a subject who from the beginning must use his/her skills to adapt to the adversities of the context. In this scenario, the pedagogical objectives start to focus on the skills that can be acquired by students throughout their academic career. The teacher, or the adult, in this process, is no longer a model to be reached to become a kind of guarantor of knowledge, organizer of learning and, more specifically, manager and regulator of training courses that are singularized according to each problem situation.

In this context, childhood is no longer understood as preparation for adulthood, consolidating a conception based on the ideas of competence and agency. The idea of competence, according to Castro (2013), is inserted in a notion of individualized subject, understood as independent from others, guided by reason and capable of deciding and choosing alone – the project of what is conceived as a citizen becomes less and less marked by the sign of rights, opening space for the concept of entrepreneur, that is, one who undertakes his own agency. In the contemporary world, the values that govern the social imaginary demand that the individual be an entrepreneur of his own life: the feat of becoming something must begin early. The stages of development towards adulthood are, if not extinct, at least camouflaged and the neurodevelopment is emblematic of this displacement. The contemporary child, as emphasized by Nadesan (2010), is surrounded with the responsibility of assuming the skills and knowledge necessary to achieve economic

and social success – which notably characterizes the logic of competences in education; brain development, in turn, appears as the main actor in this process.

In this context, it is interesting to highlight, based on the study carried out by Lisboa (2016), the consolidation of the discourse that has its origins in the 19th century, based on the relationship between brain and education, called **neuroeducation**. Neuroeducation, well characterized by the "movement" called *Mind, Brain and Education*, aims to articulate theory and practice integrating three major disciplines: neuroscience, psychology and pedagogy. The objective, roughly speaking, is to study how human beings learn, in order to develop more effective teaching methods that enhance the skills of each student (LISBOA, 2016). With the intention of representing a paradigm shift in teaching practices, since it implies an evidence-based foundation, the proposal consists mainly of educating from the brain or, more specifically, educating the brain. Therefore, according to Lisboa (2016), the brain occupies the place of protagonist of the educational process: it is for this organ (which has many meanings) that teaching and learning are considered – in this context, the brain is the subject that learns and shapes itself according to the skills acquired.

However, as pointed out by Lisboa (2016), what is meant by brain is far from being univocal. For the author, it is not a brain analyzed under different biases, but, in fact, multiple brains, that is, multiple versions of the brain performed by different actors. Lisboa (2016) states that the mutability characteristic – or "neuroplasticity" – of this brain comprises at least three senses. The first one concerns the statement that the brain develops, changing over time. A second aspect is the idea that the brain changes its configurations and connections in response to environmental and social influences. The third sense implies considering the brain an organ that can alter its functions and even its structure in the face of an injury.

Neuroplasticity, beyond a technical-scientific concept, serves as a metaphor for the supposed limitless capacity of human beings to change, learn, reconfigure and maximize themselves – a capacity that manifests itself notably in the contemporary notion of childhood. The convergence between the new paradigm of

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psychiatric neuroscience and contemporary childhood has an impact on the identity of children and adolescents and penetrates the school environment in a marked way and unlike anything we have seen before. As the school, already affected by the ideology of entrepreneurship, starts to incorporate the neuroscience vocabulary, either through neuroeducation – to maximize the brain performance of normal ones – or through categories such as those included under neurodevelopmental disorders – to search for deviants – the impact on the child's or adolescent's identity is inevitable. Through a looping mechanism (HACKING, 1995), human types classified as ADHD, ASD or Asperger, ODD etc., start to interact with the classification and see, describe and experience themselves through the lens of diagnosis. Along with this, the location of the problem in the brain has additional impacts on its self-perception. In the case of children and adolescents, this self-perception is mediated by institutions such as the school (and the family), so it is essential that the field of education critically dialogues with the knowledge that comes from psychiatry, psychology and neuroscience, fields in which neurodevelopment has been prominent.

Final Considerations

Childhood, following the indications of Rose (1999), is the sector of existence most intensely governed – in different ways over time and by different actors, discourses and knowledge. However, what is meant by childhood, as it is known, is no data, but its borders and characteristics vary over time, as well as the different fields of knowledge that deal with it. In this sense, our hypothesis is that the perspective of neurodevelopment is a product and producer of a certain way of conceiving childhood, as well as of some control practices (or perhaps governance) linked to this period. From a conception of development linked to pre-established phases to the perspective that includes a kind of performative continuum with adulthood, childhood and (neuro) development go hand in hand.

Although it is impossible to deny advances in knowledge about brain structure and functioning in recent years, the neurodevelopmental promise has not been

consummated. Several obstacles are described in order to more accurately circumscribe a biological etiology for mental disorders. In view of the difficulties exposed in the consolidation of this paradigm, the notions of risk and vulnerability are highlighted. The risk is taken individually, and each individual will have the destiny he deserves: depending on his genetic heritage, brain and choices. Childhood risk is only the beginning of a trajectory that will extend throughout the life of each individual, or better, throughout his neurodevelopment. Consequently, treating, or rather predicting, is a personal task of self-care: each one taking care of his neurodevelopment.

The notions of competence, agency and resilience, in tune with the concept of neurodevelopment, produce an understanding of the normal and the pathological that is dangerously close to moral prescriptions. How to identify factors that can lead the child to develop a mental disorder? How can the school act in the search for 'suspects', aiming to contribute to prevention or early intervention? These are questions that psychiatry linked to neurodevelopment tries to answer under apparently scientific arguments, prescribing a school space that monitors risks and encourages entrepreneurship, flexibility and adaptability – who knows, normal neurodevelopment can be ensured, and pathological deviations, avoided.

The school needs to be attentive to these movements that mix neoliberal science, ideology and morals in proportions that are difficult to distinguish a priori. This might, at first sight, seem strange to the pedagogical field, but, as we have tried to demonstrate, it has direct effects on it. The notion of neurodevelopment can be relevant in the search for a multifaceted understanding of the peculiarities, challenges and obstacles of childhood life and school reality, as long as the school inserts itself as an agent of this process, instead of being a passive recipient of neuropsychiatric knowledge.

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