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THE PROBLEM OF TRUTH IN THE SCIENCES
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EDITORIAL

It is a pleasure to present volume 31 of *Sophia: Collection of Philosophy of Education*, which groups a set of manuscripts linked to the problem of truth in sciences and in pedagogical practice.

The backbone of this edition is the approach to truth and its manifestations in different fields of human action. This publication aims to understand the constant concern of the human being to achieve truth characterized as an adaptation of thought to reality; as a concordance of thought with itself at the level of logical structure; as a regulation of facts, situations, contextual and textual realities; as a correspondence or relationship between theory and praxis; as a relationship of thought with objects (Plato and Aristotle presocratic thinking,); as a set of norms, rules and laws as said by Plato, St. Augustine, Kant, the school of Baden; as the clear and distinct mentioned by Descartes; as an immediate revelation to the human being in the empiric form; as a revelation of essences, principles and forms in the theological metaphysics; as a coherence between subjectivity and objectivity; as an useful element in the way of the philosophies of action, of pragmatism; as something instrumental as considered by Dewey, etc.

At the gnoseological level, truth is one of the major problems of knowledge. Historically and generally it has been understood from two points of view: inherent and transcendent, from where a series of perspectives, and critical-reflexive interpretations with hermeneutical relevance have been constructed that attempt to overcome even the field of action of positivism assumptions.

At the scientific level, truth is presented as an alternative to obtain universal validation of their theories, to achieve the justification of their claims.

The concept of truth has been used in various fields of science, religion, philosophy, education, politics and life itself. Thus throughout time, truth has been the perennial, complex and unresolved philosophical problem that has been, is, and will be present in human endeavor.

To the extent that the problem of truth arises from the existing relationships between subject-object; and/or subject-subject, it could be asserted that truth is a process and is the result of historicity, culture



and human trajectory. Truth would somehow represent a way of being in which praxis, knowledge, emotions, feelings, skills, attitudes, values, wills, communication and exchange are all based on human requirements, motivations, interests and purposes.

Regardless the diversity of criteria, theories and perspectives about truth, it must be considered that truth separated from essence and human existence could not be conceived, and there is not truth outside the historical-socio-cultural scenario.

In this sense, truth in pedagogical practice could be understood as the achievement of integral knowledge in the human being; as the fulfillment of learning results; as an integration of knowledge; as the relation of theory and praxis; as a process of innovation and transformation; as acceptance of the combination of subjectivities and diverse contexts; as correspondence between subject, educational institution and action. Thus, for example, constructivism considered that truth is constructed through individual and social processes.

Sophia 31 aims to respond some of the problems about truth, its multicausality, its multidimensionality and even its multifunctionality; it intends to reflect on the fundamental characteristics of truth in science, technology and education; it analyzes some fundamental theories of truth; sets out guidelines necessary to understand the post-truth and truth in the education sciences; reviews educational processes and subjective transformations that shape different types of truth, etc.

In this context, the ten articles in Sophia 31 are distributed in two clearly defined sections: the first one contains the manuscripts directly linked to the main topic, and the second covers a miscellaneous section with interesting proposals that invite to see education and the human reality from different scopes, as described below:

As for the first section, the starting point of the discussion is the paper Truth and universality: a necessary antinomy? proposed by José Ramón Fabelo Corzo. The manuscript reflects on what the author calls “epistemic violence” based on monopoly control of truth and the hijacking of universality. The writer recommends “dismantling false truths” which, in a way, have centralized the market and have validated capitalism as a natural way of human coexistence.

The second article: The correspondence theory of truth and scientific confirmation, structured by Damian Mondragón Islands. The author points out that historically, in the philosophical analysis of the concept of truth, the so-called correspondence theory was always implicit, an aspect that in his opinion is evident from Aristotle to Kant. At the beginning of



the 19th century, the detractors of this theory started arguing about the darkness and its limitations as opposed to those who from the scientific sphere set out criteria in defense of the aforementioned theory, arguing that “truth is the most important cognitive goal of scientific activity”.

Likewise the article titled *The aporia of post-truth: between post-modernism and realism* written by Jorge González Arocha. The researcher believes the problem of post-truth has arisen in recent decades, and values such as impartiality, objectivity and critical dialogue have become more difficult to achieve. Additionally, there are issues such as the emergence of new technologies and the new era in political relations called by the autor as “the rise of fundamentalism and populism”.

Ana María Alonso Rodríguez presents the manuscript *Objectivity and truth in Science of Education as a Design Science*, in which she argues that “objectivity and truth are pivotal in education, affecting the reliability of knowledge” and the recognition of its scientific role and the prestige of the teaching profession. The author intends to investigate whether objectivity is possible to achieve in the science of education; addresses the truth in its semantic, epistemological and ontological dimensions; and states that the debate on truth in education cannot be conducted away from the purposes.

Additionally, the article *Reflections about problem of truth, science and technology and its implications in the educational field*, structured by Luis Rodolfo López Morocho, intends to map the current state of philosophy around the debate on truth, knowledge and science in a context characterized by technology and its implications in educational processes. It analyzes the relationship of technology and human beings in the philosophical assumptions of Heidegger and Ortega y Gasset.

As for the second section, Wenceslao García Puchades presents the manuscript *Alain Badiou and education as a subjectivation process through truths*. The author presents some theses about the contributions made by Alain Badiou to current education. He uses the basis of the debate of structured theory by Gert Biesta for whom “education has undergone a learnification process, which prioritizes its socializing and qualifying functions and forgets its subjective function”. The intention of the writer is to recover the subjective function of education from the education model proposed by Badiou.

Likewise, *Subjective transformations in current power diagrams and their implications for education*, written by Graciela Nélica Flores and Ximena Magali Villarreal. The authors raise the issue of power in relation to subjective transformations in the framework of the current power dia-

gram; they establish relations with education and are based on the contributions of Han, Foucault and Deleuze. The researchers argue that “the subjects self-exploit themselves in a work on themselves in a paradoxical freedom through an excess of positivity of power”. They reflect on the implications of the subjection mechanisms in the educational field; they raise the need for an emancipatory and transformative praxis of subjectivities where the exercise of freedom, ethics and politics is essential.

The article Education in COVID-19 times. An interpretation from Thomas Popkewitz’s social epistemology, written by Marlon Alexis Oviedo Oviedo, intends to interpret the Ecuadorian educational activity during COVID-19 from social epistemology. The author presents social epistemology as an interpretative perspective of research and raises the need to reveal changes in schooling, the curriculum and pedagogical discourse that emerged as a result of the pandemic. In addition, the author reflects on the changes that have occurred in changing from face-to-face education to virtual education and in introducing new rules and pedagogical practices in the educational process.

Álvaro Alberto Molina D’ Jesús presents the Ontological foundation of the virtual world from the philosophy of Nicolai Hartmann. The researcher analyzes the ontological conformation of the virtual world, and he contributes to the contemporary debate inherent in the philosophy of computing from the perspective of Nicolai Hartmann; in this sense, the author intends to explain the stratification of the virtual world from Hartmann’s ontological theory of strata and categories. Among other ideas, he states that “the emergence of the reality of the virtual world is made up of the same strata that make up the sphere of knowledge of the real world: material, organic, psychic and social” and also argues that “virtual reality is a product of computing that occurs in the sphere of knowledge in which there is intervention of the ideal sphere and the sphere of the real world”.

To finish, Fabián Bernache Maldonado proposes The explanatory function of the notion of internal representation. The author raises an objection to one of the main principles of the representational theory of the mind: “The idea that the notion of internal representation has a primary role in the explanation of cognitive activity”; according to this theory, the cognitive life of an organism consists essentially of formation, processing and storing internal representations. The objection is intended to show the difficulties inherent in the application of internal representations. Among the conclusions, the researcher considers that “the



notion of internal representation is incapable of satisfying the explanatory function assigned to it by the own representational theory of mind”.

The ideas expressed in each line of this volume are intended to contribute to the generation of new questions, proposals and research that allow to modify the mind of the subject and contribute to the qualitative transformation of society.

Floralba del Rocío Aguilar Gordón
Editor-in-chief



Articles/ Artículos

TRUTH AND UNIVERSALITY: A NECESSARY ANTINOMY? Verdad y universalidad: ¿una antinomia necesaria?

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Abstract

Throughout history, oppressors have used multiple forms of violence to impose their own logic on the human universe they oppress. One such form is epistemic violence, which is based on the monopoly control of truth and the hijacking of universality. Those who apply this violence seek to convince everyone of the absolute character of their supposed truths, of the quasi-natural universality of their ways of thinking, of living, of organizing socially. Truth and universality are ineludible objects in dispute between conservative and emancipating forces. The scenario of this complaint today reaches global dimensions. Life itself is at stake. It is obvious that, without an undermining of oppressive truths and predatory particularisms dressed-up as universalities, social emancipation is not feasible. It is also not possible to conserve life. Unlimited growth, the permanent trend towards wealth accumulation, the pursuit at all costs of profit, make capital increasingly incompatible with life. False truths, such as the inevitable centrality of the market and the natural character of capitalism, must be dismantled. Following the logical-deductive method, this work aims to speak critically of the truth, but not denying its existence. This work speaks critically of truth, but does not negate its existence. Attempts are made to uncover the social conditions of the possibility of truth. It seeks to describe how truth can and should exist, if it aspires to be free and decolonized within a social paradigm such as Our America.

Keywords

Truth, universality, violence, knowledge, epistemology, coloniality

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Resumen

Entre las múltiples formas de violencia que los opresores históricamente han utilizado para imponer su lógica propia al universo humano que oprime, está la 'violencia epistémica'. Ella se basa en el control monopólico de la 'verdad' y en el secuestro de la universalidad. Quienes la aplican buscan convencer a todos del carácter absoluto de sus supuestas verdades, de la universalidad cuasi-natural de sus maneras de pensar, de vivir, de organizarse socialmente. 'Verdad' y 'universalidad' se convierten en insoslayables objetos disputables entre las fuerzas conservadoras y los empujes emancipadores de los pueblos. El escenario de esta disputa alcanza hoy dimensiones globales. Lo que está en juego es la vida misma. Es obvio que, sin echar abajo las 'verdades opresoras' y los 'particularismos depredadores' vestidos de 'universalidad', la emancipación social no sería factible. Tampoco sería posible la conservación de la vida. El crecimiento ilimitado, la propensión permanentemente acumulativa de riquezas, la vocación hacia la maximización a toda costa de ganancias, hacen tendencialmente incompatible al capital con la vida. Es preciso desmontar las falsas verdades que han convertido en sentido común la centralidad supuestamente inevitable del mercado, que han transformado al capitalismo en el modo natural de convivencia humana. Siguiendo el método lógico-deductivo, este trabajo tiene como objetivo hablar críticamente de la verdad, pero no negando su existencia, sino intentando develar las condiciones sociales de su posibilidad, de cómo puede y debe vivir la verdad si aspira a ser libre y descolonizada en un marco social como el de Nuestra América.

Palabras clave

Verdad, universalidad, violencia, conocimiento, epistemología, colonialidad.

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Introduction

*La verdad se revela mejor a los pobres
y a los que padecen.*
José Martí (1975, p. 139).

*¿Tu verdad? No, la Verdad. Y ven conmigo a buscarla.
La tuya, guárdatela.*
Antonio Machado (2017)

Throughout history, oppressors have used multiple forms of violence to impose their own logic on the human universe they oppress. One such form is epistemic violence, perhaps the most veiled yet indispensable for them. This violence is based on the monopoly control of 'truth' and the kidnapping of 'human universality' by those who, with their own and particular interests, thanks precisely to this control and kidnapping, mask as true their own vision of the world.

Naturally, epistemic violence relates to other forms of violence — economic, political, military —. The economic and political ‘victories’ now achieved by transnational capital, sometimes by turning to physical-military violence, and sometimes through all sorts of ‘memo-liberal’ tricks, seek to be legitimized and progress in time. This is the responsibility of epistemic violence. Their doers must convince all and themselves of the absolute character of their supposed truths, of the quasi-natural universality of their ways of thinking, of living, of organizing socially.

Thus, ‘Truth’ and ‘Universality’ are unavoidable objects that can be disputed between the conservative forces and the emancipating struggle of people. The scenario of this dispute now reaches global dimensions and goes even beyond the capital-labor contradiction. What is at stake is life itself. It is obvious that social emancipation would not be possible without putting down oppressive ‘truths’ and predatory ‘particularisms’ dressed as ‘universality’. Nor would it be possible to preserve human life. The logic of capital is increasingly misplaced with the self-reproductive logic of life. Unlimited growth, the permanently cumulative propensity of wealth and the vocation toward maximization at all costs of profit, make capital incompatible with life. The false ‘truths’ that have made the supposedly inevitable centrality of the market, which have transformed capitalism into ‘the natural’ mode of human coexistence, must be dismantled. Epistemology must also contribute to safeguarding the species.

As known, epistemology focuses its attention on knowledge and its basic problem is the true status of that knowledge. Following the logical-deductive method, this work speaks critically of the truth, but not denying its existence, but trying to reveal the social conditions of its possibility, how can truth live and must live if aspiring to be free and decolonized in a social framework like that of America. In short, it refers to how to combat the often-invisible epistemic violence.

To this end, the paper is structured in three parts. The first part dedicated to elucidating fundamental aspects of the relationship between knowledge and coloniality, deepening on the link between the content of knowledge and its place of enunciation, and at the same time, to warn about the dangers of denying universal truth to which recognition of that link is sometimes led incorrectly. A second part addresses the fundamental ways of the humanly universal existence as the basis for differentiated epistemological strategies in their apprehension, having the first two as premises; finally, the third part of the work seeks to respond to its main problem: Can knowledge about the universal be true? Under what conditions?



Knowledge and coloniality

The topic is relatively old. This is an old concern about the relationship between the content of knowledge and the sociocultural context in which it is placed. As known, the classic paradigm of knowledge prevailed in modernity, signed by an ideal of scientific objectivity that presupposed the full reproduction of reality, an uncontaminated reflection in relation to any interest or subjectivity element, an image that sought the revelation of the world as this supposedly is, regardless of the belonging to that world of the subject of knowledge itself.

That modern paradigm tends to be overcome more and more in our days, and the idea that any subjective interference in the knowledge process can be avoided has clearly been questioned. Seen more as a somewhat romantic pretense of the classical era, the aspiration to pure knowledge, it does not seem to have real possibilities to remain as an epistemological ideal.

To the same extent a substitute is being imposed, which recognizes the conditioning of knowledge from the place it is stated. This place of enunciation does not strictly refer to a spatial place (although it also includes it), but to a social place, a historical place. It is a set of temporal, spatial, social, classist, geo-cultural or geopolitical coordinates that shape the content of that knowledge.

What is that place in the case of Latin America? nations and people who lived at least three centuries of direct political colonialism and who have so far continued to experience other forms of more overlapping colonialism, such as indirect and undeclared. It is a fact that colonialism lasted beyond political independence, not only in the neo-colonial (politically and economically asymmetric) relationship between ancient (and new) metropolises and their former colonies, but also on the cultural, and epistemic spheres.

A concept arose to refer to such cultural colonialism: 'coloniality'. It was created in 1992 by Peruvian Aníbal Quijano and appeared in his works referring to the meaning of the 500 years of America's so-called 'discovery'. These works were titled coloniality and modernity-rationality (1992) and Americanness as a concept, or America in the modern world system (1992), the latter published together with Immanuel Wallerstein.

The concept of 'coloniality' has had multiple developments, not only on the part of Quijano until his death in 2018, but also on the part of many other authors. There is a whole theory around this concept: 'the theory of coloniality/decoloniality'. This latter concept—decoloniality—



was later incorporated and alludes to the thinking and alternative practices to coloniality.

How can coloniality' be defined succinctly and understandably? In response to this question, a fragment of a work published a few years ago by the same author of these lines indicates:

Coloniality [...] encompasses what could be considered as the cultural logic that is part, accompanies, complements and survives colonialism itself. It is disguised as supposedly absolute truth, supposedly universal values, as supposedly human and/or cultural superiority of the colonizer. It appeals to the authority of religions that exclude the right to exist in any other creed, scientific theories that present as irrefutable, ethical norms that moralize inequality, oppression and even extermination of artistic expressions that are presented as the only ones able to satisfy the most purified judgment and that mark their difference in relation to everything that, at most, begins to be codified as the folklore and crafts of exotic societies. Coloniality conquers common sense, that of the colonizers, but also that of the colonized (Fabelo, 2013, p. 92).

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Coloniality is lived everyday by turning on television and listening to international news, most often elaborated from the perspective of international broadcast; when going to the cinema to watch almost always an American film in which the world is perceived as they see it, worshipping the 'heroes' or 'superheroes', who are of course Americans, and who are created for themselves and also for the viewers. There is coloniality when the politicians of southern nations surrender to supposedly successful social models designed in North America or when they subordinate their own policies to imperial dictates. Additionally, when it is assumed that a work of art produced in the global south is good because it is recognized or exhibited in one of the European capitals; or when academic excellence is attributed to a product because it was published in another language and in another central country, even if none of its fellow citizens read it; or when a program is taken from humanities subjects taught at universities not located in the global north and, when reviewing the bibliography and seeing that all the content is European or American, although authors do not have any idea of the characteristics of humanity that do not belong to that group and assume the characteristics of their own as if they were universal.

All this is an expression of subtle epistemic violence. Coloniality is something like glasses through which the world is seen unnoticed. Even the self-image of the (ex)colonized subject depends in many cases on the discourse that Europe and the West has built upon it. From the Said's

Orientalism of (2008) to Mignolo's Latin America idea (2007), the idea is the same: the other, the non-European is a kind of discursive invention of Europe.

There are excesses here. More than a discursive invention, 'East' or 'Latin America' are the result of practical construction. More than invention is construction, and more than speech is colonial historical practice that constituted Latin American and the people of the 'South Global' as a new historical reality. These excesses have been mentioned at other times (Fabelo, 2014, 2016).

This work is directed to what is considered the source of another unnecessary excess: The one referring to the epistemological status, in which the truth remains after having done this critique of coloniality.

The evident historical kidnapping of the truth imposed by hegemonic colonialist epistemologies undoubtedly requires the search for alternatives. 'Epistemological resistance' must be added to the political resistance to the perpetuation of colonialism, as pointed out by Boaventura de Sousa Santos (2009, p. 49).

What does resistance mean? Lyotard (1987), have understood it in the postmodern sense as the 'end of metanarratives' or as renunciation of any truth that claims universality. No individual is supposed to be able to attribute centrality in the knowledge of universality. The story of epistemic eurocentrism is considered as more than eloquent argument.

The theoretical basis of this idea would seem to be as follows: because all knowledge is valuable and conditioned by its place of enunciation, then its validity would be referred exclusively to the existential frameworks of its enunciating subject; there would not be and could not be universal truths. It would be the epistemological basis of the postmodern statement on the 'end of metanarratives'.

But is that the alternative? Considering that individuals have different ideas and therefore different ways of seeing what is universal, can the universal itself be, at least, incognizable and, at most, non-existent? Will this not be an even more veiled form of epistemic violence?

It is immediately apparent that there are two issues to be solved: One, 'the issue of real and objective existence' of human universality and the way in which it exists; the other, assuming that its existence is recognized, 'the problem of whether or not this universality is apprehensible' by knowledge and, moreover, under what social conditions it is best understood.



On the ways of existence of the humanly universal

It is appropriate to begin by recognizing the existence of the universal that unites us as 'species' and 'gender', something that is not necessarily bypassed with the infinite diversity of the human. Based on this, it could be affirmed that we are, at the same time, unrepeatable singularities and representatives of the same human universe. The reliability of this statement seems obvious. However, the absence of a minimally dialectical thought has rarely led to a false disjunction. If our universal common identity is accepted as human, collective or individual differences tend to be unknown. On the contrary, if diversity is recognized, then the common, the general and the universal are denied.

Despite their unilateralism, the two positions described have their real epistemological basis. On the one hand, that foundation lies in the fact that the human being is a species like others, with common attributes that allow to identify himself as such and to differentiate himself from any representative of other non-human species. In this real characteristic of the human, the emphasis is placed on the first position. On the other hand, the human being is also an individual and socially differentiated bio-socio-cultural product, with immense range of variants that make virtually impossible the exact repetition from individual to individual and from culture to culture. In this characteristic of the human, the attention is in the second way of understanding him.

As a trend, modern, classical, Eurocentric and colonial Western thinking, explicitly or tacitly, assumed the first alternative. The studies on the human, especially on the own and European, were presented as the knowledge of the universal human. Its experiences were elevated to the range of universal knowledge, even though in its construction it would no longer take into account multiple concrete expressions of the human.

The second variant, denying universality itself, is quite typical of postmodern thinking and is also present in representatives of postcolonial and decolonial theories. By focusing attention on the diverse and the immense variety of human expressions, it tends to deny, both the general, that nourishes collective identities, and the universal, that qualifies the human himself. As seen below, this way of (not) understanding the universal leads (consciously in a way or not on the part of the authors who promote it) to a 'new variant of epistemic violence' that mistakenly appears as 'emancipator' in relation to it.

Because of the latter, it is very important to show, once again and in spite of its apparent obviousness, the very existence of the human-universal as a constituted reality and the ways in which it is conceived. It



is worth distinguishing between what could be termed ‘species universality’ and ‘gender universality’.

The distinction between *species and gender* can offer the methodological key to solving the problem of the *absence of dialectics* that often characterizes the way in which the relationship between the different and the common of human beings is addressed, and at the same time, the different types of universality in which they can live.

The concept ‘species’ points to a type of universality associated with the ‘specific difference’ that allows the human to be distinguished from what is not. Its existence is an evolutionary result and its admission must already be, at this point, unquestionable. It is based on those branches of knowledge that need to distinguish the human species from other species: biological sciences, evolutionists, anthropological, etc.

More problematic is the concept of ‘gender’, which is polysemous¹. In this paper is used the concept with the semantic meaning that refers to the possession of common general characteristics, as the case of ‘human gender’, and not precisely when talking about ‘gender approach’, alluding to the set of characteristics used in society to distinguish between masculinity and femininity. The concept of ‘gender’ (‘human’), however, as used here, refers primarily to a certain historical-evolutionary result, to a product that also includes the cultural, the constructed practically and spiritually by the human being itself.

Species laws are closer to human biosocial nature. Generic laws are also sociocultural and, therefore, differentiated for disconnected human groups. They are a result of their own and particular historical evolution, often dependent, in turn, on short-term factors, on environmental specificities, climatic, characteristics of flora, fauna, height, proximity to the sea, sources of drinking water, soil fertility, etc.

As a species, the human being is already born, regardless of the cultural or temporal framework, as a real or potential bearer of a series of universal attributes. It refers to ‘real’ or ‘potential’, because some of these attributes are not presented at birth and require ontogenetic development in a socio-cultural environment for their development². They are both biological (genetic information, anatomical and physiological structure), psychological (awareness, reflexive capacity, especially human sensitivity mediated by conscious processes) and social (community life, exchange of activities and their products in the form of social work, linguistic communication, etc.).

However, these universal attributes of the human being as ‘species’ do not cover the full spectrum of human universality. They identify the



human being as a 'biosocial being', distinguishing him from other species and thus delimiting his 'specific difference'. But these are not enough to explain, for example, the functioning of the value law in the world market, a law that today, in fact, reaches a universal dimension. This second is a different universality. The world market is a 'historical product' that arises from the development and universalization of a market that was not always global but local.

But how has this new universality become a historical product? We will have to go to the beginning. The history of today's human being begins as one, which began in Africa, from the same position related with the offspring of a common parent, the so-called symbolically as 'Mitochondrial Eve'²³. The universality of species, initially guaranteed by common origin, was derived in gender universality to the extent that it incorporated socio-practical elements with a historical nature. But that story, to the extent that the descendants of that symbolic 'Eve' remained, concentrated and interacted in the same social space, was fundamentally the same for the species' representatives. Therefore, species and genus have basically the same human universe.

The successive waves of migration from their place of origin, now known as Tanzania region, originated particular stories. Although the species remains, the genus is dispersed and disaggregated. Each story shapes its own version of the generically human. There is one species, but there is no longer a single genus. The initial generic dimension of the universal human is becoming extinct to the same extent that its praxis and history lose the universality with which they were born.

Every wave of migration from the original human nucleus, dissimilar settlements in new regions to almost the entire planet, promoted a process of cultural diversification. As the Brazilian anthropologist Darcy Ribeiro (1992) points out, this "process, with a diversified nature, responds to the need for differentiated ecological adaptation that makes the culture of each society more specific, specializing in a certain environment or diverting its development by particular historical events" (p. 9). Thus, originating multiple local stories increasingly disconnected from each other and from their common trunk. Each promotes its own cultural characteristic.

Different trajectories, such as those of historically *pre-universal* towns (prior to the process of (re)universalization of history that began in 1492), could not result in the same historical product. Diverse cultural products have an indefinite quantity of mediations that, due to their complexity, make their exact reproduction in different contexts to

be practically impossible, especially if they do not have contact with each other. Diversification reaches such a degree that when, over the centuries, some cultures meet others, it is often even questioned whether the others belong to the same species.

But diversity never completely breaks with universality of departure. Belonging to the same human family sets the need for common responses to similar external stimuli. Moreover, even at this stage of cultural evolution, marked by diversification, there are factors that tend to make human acting general and common. For Darcy Ribeiro (1992), this is due to “the performance of a series of uniformed causal forces, among which we must include a general imperative [...]” (p. 9). According to this author, the ‘general imperative’ lies in:

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The uniformity of nature upon which man acts and which forces him to adjust to physical-chemical and biological regularities external to culture. The homogenizing role of this imperative is expressed mainly in the productive technology which, because of its direct relationship with nature, must necessarily comply with its requirements. In response to this imperative, we find a minimum of objective knowledge and of generalized ways of doing something in all cultures, i.e., the logic of things is imposed on cultures, challenging them to develop through perception and adjust to their principles (1992, p. 10).

Thanks to this imperative and to the fact that it is the same species with common basic needs and capabilities, differentiation never becomes absolute, even if various human groups have no contact with each other for long periods of time. It is striking that they share common ways of acting, of thinking, and of saying, even with the use of similar logical rules in thought and similar syntax in languages that seem to have very little in common. As Ribeiro (1992) points out:

The whole anthropological bibliography shows [...] the reiterative nature of the responses recorded in history for the different causal challenges that societies have faced, expressed in the presence of so many common forms of social stratification, institutionalization of political life, religious behavior, etc. [...] (p. 11).

Most of the traits of different non-connected human groups occur in the field of the production and reproduction of material living conditions, associated with their basic needs and capabilities, as well as their consequent ‘common logic’ of practical action and thinking. Obviously, as the analysis moves away, differentiation, and particular features of different cultures appear, and its ‘own historical logic’ is more prominent.

Therefore, differences are more substantial at the level of spiritual culture and the values of collective consciousness, especially in these 'pre-universal stages of history'.

These 'own historical logics', which follow the various historical resources of historically 'pre-universal' societies, are the main responsible for all the immense diversity of the human. Beyond the unity of departure as a species and the unity of the natural world with which the human interacts, history and its logic respond to social laws which are a historical product, which presupposes alternatives and 'free' choice by the human actor. The well-taken 'historical necessity' that Marx rightly speaks of is itself a concrete historical product. Social laws are not made without subject, without subjectivity, and there is no way in which there can be uniformity in human subjectivities as a whole in populations that have followed different historical courses. A subjective difference, insignificant as it may seem, can lead to totally divergent historical lines.

None of these stories is in itself more universal than the others, none is more human than the others. The socio-historical and cultural evolution of the human does not pass through a fatally *pre-determined* lane. History is born with its own practical realization and will only create universal products when it is itself universalized. Understanding it and avoiding the extremes represented by both cultural relativism and radical teleological evolutionism is the only way to assume the existence of the generic universal as a historical product. At the same time, avoiding ethnocentrism that tends to take a particular cultural history like 'classical' and 'universal', while considering towns that have not followed their course as 'out of history', 'barbarians' or 'uncivilized'.

However, just as standardized forms of cultural behavior are much less likely among unrelated societies, they occur frequently among societies organically linked by history. The processes of historical integration, through imperial wars of conquest and colonization, tend to foster cultural standardization, a product not only of the cultural imposition of the victors to the defeated, but also as a result of the assimilation, by the former, of cultural products of their victims that they consider exploitable.

Only from 1492, with the beginning of the contradictory modern process of universalization of history and the appearance of what Wallerstein calls the 'first modern world-system' (1974-1989), does the practical and historical possibility of a universal generic return of human beings reappear. The new generic universality could only be the product of a universalized history. If the different stories used to foster a predominantly differentiation process, the new process of historical universaliza-

tion now entailed a tendency toward interlinking, the result of a cultural exchange that also included much imposition. The differences dragged by the dissimilar human ensembles who were victims of conquest and colonization did not disappear, but they had to be subordinate to the imposed culture. Coloniality is born and, with it, the kidnapping of universality by the colonizing culture.

But recognizing that kidnapping, real and deplorable, does not mean denying the real practical basis of a new kind of universality. One thing is what the contact and practical interaction of great human groups, which has taken place since the conquest and colonization of America by Europe, means in terms of real universality, and another is the way in which this new universality is interpreted and instituted from the imperial power. Here, a multidimensional approach to this fact is needed⁴.

The reflection carried indicates that if sticking to 'the real dimension' and 'objective of human universality', it would result on what Maturana (1995) described as 'phylogenetic drift' (pp. 120-122). There is a very important component of this universality that is a historical result, the product of praxis, of the practical construction of a human world of dimensions increasingly identifiable with those of the planet itself, with the whole biosphere.

This universality is not guaranteed by the mere fact of being human, it is a universality built historically and, therefore, after the emergence of the human being itself; it is a dynamic, changing, concrete universality in each of its moments. The ingredients that make it up are not eternal, because they are precisely historical; they arose at a certain moment and can disappear at another time and be replaced by new attributes that are also universal. The world market, as a fundamental way of socially relating humanity, does not have to be eternal, at least, not with that role, which is an abstract-unfamiliar role of the concrete life of every human being.

Being 'human' does not mean the same thing in all ages or culture, precisely because its attributes are not only the result of a phylogenetic evolution, but also of a historical evolution of humanity that has passed through diverse moments, in the framework of ethnicities, cultures and civilizations without full mutual contact.

Only by bringing together phylogenetic universality (as a species) with historical universality will the generic universality of the human being, the concept of human gender, be obtained. The human being, generically understood, is, as in the case of other species, a result of phylogenetic evolution, but, unlike other species, it is also a historical product



constituted by the human being through the accumulated praxis. This historical universality, as a component of the human gender, is transmitted from generation to generation and from culture to culture through the proper human means of transmitting experiences: the sociocultural heritage, which finds its synthesis in human objects, results of praxis, and in language, which allow the symbolic substitution of those in the process of transmitting experiences.

It means that the objective existence of the universal human must be recognized in both versions, as 'species' and as 'gender'. In characterizing it as objective, it is being alluded to the fact that its existence does not depend on someone assuming it, but as an evolutionary and historical product.

Can knowledge about the universal be true? Under what conditions?



Once recognized the existence of this universality, it is worth asking: is it apprehensible by knowledge? It must be clarified that this question does not only refer to the way in which this universality (subjective dimension) is subjectively interpreted, nor to the way in which certain interpretation is institutionally imposed on the human universe through power (institutionalized dimension). Both dimensions are obviously searchable by sociological surveys, in the first case, or by studying the institutions in charge, in the second. The question of interest here is whether a relationship of truth or appropriateness is possible between the subjective dimension, on the one hand, and the objective dimension, on the other; in other words, if it is possible a true knowledge of the real universality, as an evolutionary product that leads to the appearance of our species and that it is, later, objectified by the very historical praxis that constitutes us as a genre.

With this question, the main concern moves from the ontological aspect (the problem of the being of universality) to the epistemological aspect (the possibility of its true knowledge). The idea is to accept or not accept the possibility of that true knowledge and, secondly, to see what epistemological and/or social conditions would be necessary for a particular subject to be able to capture it in his truth.

This topic is definitely complex. First, because of the complexity of the object to be reproduced as truth. Humanity is found only in the uprooted of a true universal history, full of enormous contradictions, yet

without full recognition of the ‘other’ as belonging to the same human universe. In the history of humanity much progress has been made in that recognition, from the equality of all men before God in Christianity, going through the acceptance of humanity of the ‘American Indian’ in the papal bull of 1537 and continuing with the announced equality before the law of all human beings in the liberal ideal of the French Revolution. The fact is, however, that humanity still has to move to the real (and not just formal) equality of all humans in terms of their opportunities, the possibility of unlimited development of their capabilities, and the full deployment of their personality.

But this is no longer entirely possible within an oppressive society such as capitalism, which increasingly shows its incompatibility with the sustainability of human life. Capitalism is also a historical product, certainly universal today, but transitory, ephemeral, finite, maybe because it ends with humanity and its history, or because humanity ends with it historically and replaces it with a new form of universal coexistence, for a new world-system.

However, because of these contradictory relationships that, within an oppressive society such as that of capital, are present within the human universe, the relationship to universality is different and even contrary among the various groups that make up that universe. Exploitation, inequalities, private ownership over the means of production are the main causes of the clash of interests between these various groups and between them and the gender that includes them. Driven by hegemonic, class or imperial interests, society can lead against the generic interest of the species, diverting from the course it would need most, associated today, as never before, with the safeguarding of life.

Under these conditions, marked by deep social asymmetries, it is not possible to identify human universality in a practical-generic sense, as occurs in all individuals who make up the gender. Universal interests are not the same in all human beings. They are born from the social and historical system of social relations. They are not abstract, but historical and concrete. For that reason, when Marx (1980b) reflected on human essence in a world plagued by social contradictions, he pointed out that essence (and the same could be said of the universal identity of the human) “is not something abstract inherent to every individual. It is in reality the whole of social relations” (p. 3) in which all other individuals are inserted.

Is it possible, under these conditions, a true discourse on the universal? If the answer is no, then it should be assumed as a derived practical recommendation, renunciation of any claim to capture something that is



not in itself observable, and acceptance as valid of any practical conduct derived from the self-perception of universality, although it differs diametrically between different subjects. But is that actually practicable? Will there be anyone who really gives up any worldview or denies any truthfulness so as to please those philosophers who ask to forget the universal?

It can be seen what this would lead to. If internationally there are, indeed, frankly conflicting views on a global issue involving all human beings, such as climate change, and one of the parties (the one that expresses the interests of capital transnationals) denies or minimizes it (or says it is a ‘Chinese invention’, as Donald Trump once pointed out), while the other seeks at all costs to protect nature and stop climate change, who is right? If no one can grasp the universal, no one is right, we would say both positions are equally valid, even if one leads to the self-extinction of humanity. That cannot be the way out. The truth is relative, it is concrete, it is contextual, but it is real and, above all, it is necessary to life.

Human beings will never renounce, in practical terms, to the attainment of a truth in the knowledge of the universal. Possessing a conception of the world is a requirement of one’s own consciousness as a human psychic attribute. Nor will it be able to get rid of its particular social environment at the time it is established as the subject of knowledge. The solution to this theoretical-practical conflict cannot be an even greater division between theoretical and practical components. Neither abstract theory nor pragmatic practicality will shed light on the problem alone. The theoretical-practical symbiosis that this issue calls for leads to the point that the way out to the evident centrism that has always accompanied knowledge is not in the acceptance of an alleged theoretical runout, which relativizes and ends up annihilating the truth, while leaving things as they are—threatening the life of the species and the future of humanity—to the practical level, but in recognizing a protagonist, both epistemic and practical, those social subjects who, precisely because of the place of enunciation of their thought, are in a preferential position to achieve a truth that is not only for themselves, but also for the generically human. As Antonio Machado (2017) mentioned: “Your truth? No, the truth. Come with me to look for it. Keep your truth for you.”

De Sousa Santos (2018) does not by chance resort to the concept of ‘Our America’ of José Martí when he mentions the need for ‘new emancipating paradigms’ and ‘new epistemologies of the South’, certainly pluralistic, democratic, but ‘of the South’, which points to a subject (complex, but definable and preferential) in the knowledge of the universal. To such an extent it can be universal that the Portuguese thinker speaks of this

moment that we are living like that of a possible ‘century of Our America’ (pp. 84-106), alluding to the universal potentialities of our region as a place of enunciation and praxis, a place whose idea would allow not only a better capture of the universal, but also a more likely practical emancipatory projection, something humans need urgently at the crossroads between life and death, in which the logic of capital has placed them.

The idea is not to mention that only emancipatory praxis is universal. In fact, universality is a historical result of other practices that are not necessarily emancipating, in the case of people of Our America, from the practices that submitted them as colonized people. Instead, it was the practical colonizing action of Europe that united its victims as colonized and that articulated their respective demands for emancipation. It is the same methodological idea that Marx followed. It is capitalism that unites all workers as proletarians. Today we would go further: it is the system of multiple domination of capitalism, including its colonial ingredient, that unites its dominated, as subordinates, as oppressed, as ‘global South’.

The most common and universal needs that all human beings have is the lack of satisfying objects, which originate concrete and shared material interests, those that are, in fact, universal interests. What unites them as subjects who need to know and change universality itself is not some kind of metaphysical reason, but, in any case, historical reason, i.e., the real fact that under certain historical conditions some subjects, acting toward the attainment of their own interests, express interests that transcend them, interests of a human universe greater than that of themselves.

Overcoming the West’s self-attributed epistemic centrality necessarily goes through its denial by assuming the epistemic privilege of its opposite, as a necessary step ahead for a decentralized epistemology that can only come after the subaltern world imposed the power of ‘its truth’, not only and not so much in epistemological terms, but above all in practical terms, through the revolutionary transformation of the material existence conditions of all humanity. This place is not reached by denying all truth, but by making universal use of its own, for which it is essential to give it the appropriate institutional frameworks, including academics.

This means that it is also essential, from the epistemological and practical point of view, to recognize and reinforce – and not dissolve, which is sometimes sought from postmodern positions— the collective identities that unite those subjects in recognition and in action with common or even different emancipatory interests, but mutually articulating. Fighting for self-identity does not mean fighting for non-change—as it is sometimes implied— it is not to seek that the oppressed, the subaltern,



the colonized, remains being one, but quite the opposite, is to seek the changes necessary for that identity and its essence, to be aware, in the subjects involved, of the objectives necessary to their struggle.

When the need for recognition and strengthening of the identity of a particular collective subject is sustained, it is not done by invoking an (im)possible return to some civilized environment lost in the past, but in the sense of its reaffirmation as oppressed, as exploited, as subaltern, as a condition of possibility to stop being. Assuming that identities change, as is true, this does not imply complacency with the victim status of those subjects. Notions such as ‘pedagogy of the oppressed’⁵, ‘preferential option for the poor’⁶, even Ignacio Ellacuría’s⁷ so-called ‘civilization of poverty’, seek to reaffirm identities and at the same time change them. There is nothing strange about it if viewed from a dialectical perspective.

When Marx assumes the relevance of enacting the ‘revolutionary dictatorship of the proletariat’ as a necessary transitional phase on the road to a new society⁸, that concept in itself implies a ‘proletariat’ that has already begun to cease to be in its pre-revolutionary expression. He is no longer a subject without ownership over the means of production, nor a class that is the victim of the systemic oppression of the bourgeoisie. But Marx continues to identify him as such because that new identity (as the collective owner of the means of production and emancipated from bourgeois oppression) must already appear as a horizon of his struggle in a political program such as that of Gotha. The ultimate reason for the use of the word is not to express an immovable identity, but to show the identity of the same subject. The sense is much more practical than epistemological or it is the one that corresponds to a practical epistemology in the sense of Marx’s thesis XI on Feuerbach⁹.

In other words, it is necessary to recognize the characteristics of its own in order to leave it. It is that simple. The transition to the necessary universality, desired and hoped, will only be made through the practical struggle of all subjects who have to get what they lack as oppressed subjects. If there is no full awareness of that oppression, those subjects will never become fighters against oppression.

Therefore, the first thing they have to do is recognize themselves as oppressed. It is the preliminary step to stop being one. They must see themselves as oppressed so that they can see themselves in some future as unoppressed and thus have the awareness to fight for that purpose.

When Marx and Engels appeal to the union of all the proletarians at the end of the Communist Manifesto¹⁰, it was not for them to remain

eternally, it is obvious, but for them to be aware of who they are. Hence, they would need a 'revolutionary dictatorship of the proletariat'.

The term 'dictatorship', now of course controversial in a context such as Latin America, in Marx meant the right and the need for the new class in power to assert its truth, in practical and epistemological terms, to the entire social universe. No more and no less than the same thing that all the classes that have owned power have done throughout history.

However, there is a big difference: the purpose is not to maintain oppression, but to eliminate it; it is not to impose a false interpretation of universality on the full human universe, but to allow everyone to access the universal truths that they will build among all; it is not to perpetuate itself as a group elected in power, but to seek its own disappearance as a social class, together with all the others, increasingly approaching a self-managing society. Self-manager, both in its praxis and in its knowledge of the truth about human historical universality.

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Conclusions

It is necessary to confront critically those theoretical positions that by 'announcing an epistemic decoloniality' reject all kinds of universality by identifying it with what have been until now European, Western or American particularities imposed as universal. Perhaps without full awareness on the part of its supporters, this position points to a new type of epistemic violence, one that denies alternative, historically oppressed subjects who have never gone beyond being the 'alter ego of European centrality', to become now the central subject, knower and doer of the new universality that all humanity needs.

More than theoretically, this position needs to be rejected from the praxis itself. The denial of all universality is in conflict with the practical need to integrate the emancipatory efforts of the different alternative particularities, and without articulation and unity, as subjects of knowledge and action, the necessary change would be impossible. The authors agree with Castro-Gómez (2018), when mentioning:

It is argued that any claim of universality must be completely abandoned in order to seek the release of the particularities submitted [...]. The result of this [...] is the inability to articulate a common will that goes beyond particularisms. Universality does not preexist the articulatory practices that make it possible [...], but is an effect of them (p. 38).

This presupposes ‘other humanities’, which have a critical subsumption relationship with the entire Western humanistic tradition, which does not deny it, but which does not assume it either objectively; that may question it and take from it everything that truly expresses – beyond a particular place of enunciation – a generic human truth. At the same time, they will be ready to build their own truths, without prejudice, without any complexity. Genetics has long demonstrated the non-existence of races. Much less there is greater natural capacity of knowledge in any human being.

If referring to temporal epistemic privileges, it is not by any natural superiority, but by being the truth, ultimately, a bio-logical necessity or, what is the same, a necessity of the logic of life, necessary for those who are most in danger of their own. Hence the phrase of Martí (1975) “Truth is better revealed to the poor and those who suffer” (p.139).



Notes

1. For more information see the multiplicity of meanings in Wikipedia, which has required a page of disambiguation. (“Gender”, 2020).
2. These are universal attributes of the human being as a species that require a specific socio-cultural context, whatever it may be, for its development during ontogeny.
3. According to research carried out in recent decades and which included comparative studies of mitochondrial DNA from different ethnicities belonging to different regions of the planet, all current human beings have descended from the same woman—a common mother species baptized as mitochondrial Eve, who might have lived 190 000 or 200 000 years ago in East Africa. (Pakendorf & Stoneking, 2005).
4. In another context, in that of axiological theory, we have developed a proposal to interpret values in a multidimensional way, recognizing at least three dimensions in which they exist: objective, subjective and instituted. (Fabelo Corzo, 2007).
5. Nomenclature used by Brazilian Paulo Freire to define his new pedagogy (1999).
6. The preference for the poor is a basic principle of the liberation theology. As Gustavo Gutiérrez argues, it is “a central theme of this theology and is now widely accepted in the universal Church: the preferential option for the poor. It is a deeply rooted biblical perspective” (1990, p. 308).
7. In arguing his proposal, Ignatius Ellacuría points out: “If the world as a whole has been shaping, above all, as a civilization of capital and wealth, in which the one more objectively and the other more subjectively have been the main driving elements, conformers and directors of today’s civilization, and if this has already provided all the positive aspects and is currently causing ever greater and more serious problems, it must be propitiated, not its correction, but its superative impersonation of the opponent, i.e., by a civilization of poverty.” “The civilization of poverty [...] rejects the accumulation of capital as the engine of history and the possession-enjoyment of wealth as a principle of humanization; universal satisfaction of basic needs is the principle of development and the foundation of humanization is the enhancement of shared solidarity” (1989, pp. 169, 170).

8. “The period of the revolutionary transformation is between capitalist and communist society. This period also corresponds to a political transition period, whose state can be nothing other than the revolutionary dictatorship of the proletariat” (Marx, 1980a, p. 9).
9. “Philosophers have done nothing but interpret the world in various ways, but it is a matter of transforming it” (Marx, 1980b, p. 3).
10. “PROLETARIANS OF ALL COUNTRIES, UNITE!” (Marx & Engels, 1980c, p. 69).

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THE CORRESPONDENCE THEORY OF TRUTH AND SCIENTIFIC CONFIRMATION

La teoría correspondentista de la verdad y la confirmación científica

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Abstract

Historically, implicit in the main philosophical analyzes of the concept of 'truth' it was implicit what is now known as the correspondence theory of truth, which can be traced from Aristotle to Immanuel Kant. In the early nineteenth century, detractors of the correspondence theory of truth began to argue, among other things, that this position is obscure, too narrow and self-indulgent or argumentatively circular. However, in the scientific field some contenders of certain realistic positions of science have considered that truth is the most important cognitive aim of scientific activity. This study was conducted to establish the plausibility of this realistic argument. By analyzing the validity of some ontological, semantic and epistemic arguments proposed by some defenders of different versions of the so-called 'Scientific Realism', with which an attempt is made to relate the empirical and predictive success of the best scientific theories with the truth, it is shown that, from a logical point of view, seems difficult to confirm that such theories provide with a reliable knowledge of the natural world. It is suggested that scientists are not confirmatory agents; but rather probabilistic agents, that is, agents that seek to calculate the probability with which a truthmaker makes a truth-bearer true, with which science communicates its results.

Keywords

Science, truth, confirmation, correspondence, realism, logic.

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Resumen

Históricamente, en los principales análisis filosóficos sobre el concepto de ‘verdad’ estuvo implícita lo que hoy se conoce como la teoría correspondentista de la verdad, la cual puede ser trazada desde Aristóteles hasta Immanuel Kant. A principios del siglo XIX, los detractores de la teoría correspondentista de la verdad comenzaron a argumentar, entre otras cosas, que esta postura era oscura, demasiado estrecha y autocomplaciente o argumentativamente circular. No obstante, en el ámbito científico algunos defensores de ciertas posturas realistas de la ciencia han considerado que la verdad es la meta cognoscitiva más importante de la actividad científica. Este estudio se realizó para establecer la plausibilidad de este argumento realista. Mediante el análisis de la validez de algunos argumentos de tipo ontológico, semántico y epistémico propuestos por algunos defensores de distintas versiones del llamado “realismo científico”, con los que se intenta relacionar el éxito empírico y predictivo de las mejores teorías científicas con la verdad, se muestra que, desde un punto de vista lógico, parece difícil confirmar que tales teorías puedan proporcionar conocimiento confiable del mundo natural. Se sugiere que los científicos no son agentes confirmadores; sino agentes probabilísticos, esto es, agentes que buscan calcular la probabilidad con la que un hacedor de verdad convierte en verdadero a un portador de verdad con el que la ciencia comunica sus resultados.

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Palabras clave

Ciencia, verdad, confirmación, correspondencia, realismo, lógica.

Introduction

The topic of truth has been the subject of various analyzes throughout the history of philosophy and the philosophy of science. Historically, a correspondence position of truth was implicit in the main philosophical analyzes on this concept, which can be traced from Aristotle to Immanuel Kant. However, at the beginning of the 19th century, some philosophers interested in the subject began to systematically problematize what is now known as the correspondence theory of truth. It was questioned, among other things, what exactly corresponds to the natural world.

Opponents of this theory have argued that this position is, among other things, dark, too narrow, and self-complacent. However, in the scientific field, some advocates of certain realistic positions of science have considered truth to be the most important cognitive goal of scientific activity. To sustain the above, ontological, semantic, and epistemic arguments have been proposed to relate, for example, the empirical and predictive success shown by the best scientific theories of the truth, arguing that such theories can provide reliable knowledge of the natural world. However, it has not been established precisely how this relationship can be confirmed, so it remains unclear exactly what a scientific truth is. Likewise, insufficient attention has been paid to the role of the concept of ‘correspondence’ in

the construction of the concept of ‘scientific truth’. Bearing in mind *epistemological scientific realism*, this text presents some logical arguments that represent a challenge to a finished notion of confirmation that seems essential to a correspondence theory of truth that seeks to explain the supposed correspondence between those who are called ‘doers of truth’ and ‘bearers of truth’. Finally, this study suggests that scientists are not, after all, confirmatory agents, but probabilistic agents; i.e., agents seeking to calculate a real doer making true from scientific discourse.

A review is made on how some philosophers have understood the concept of truth. Later on, some of the correspondence theory of truth is presented in the field of scientific research. Then there are some confirmation problems in the framework of the ontological, semantic and epistemic commitments defended in the so-called *scientific realism*. Finally, some conclusions that can be inferred from this study are discussed.



The correspondence theory of truth: A Historical Approach

According to the Royal Spanish Academy (2020), the concept of ‘truth’ is defined as “conformity of things with the concept that forms the mind”. Note that this definition uses the verb ‘conformity’. It is not by chance that the dictionary uses this verb since it reflects one of the first philosophical positions on this concept, i.e., the correspondence theory of truth. According to this position, truth—or true—corresponds to or is in conformity with a fact. So, it is possible to tentatively explore a first philosophical definition of the concept of ‘truth’, namely:

Definition 1a:

x is true if and only if it corresponds to a fact.

x is false if and only if it does not correspond to any fact.

Here is an example. According to the correspondence theory of truth, snow is white if and only is a fact that snow is white. Of course, facts can be current or potential, so the following definition includes this possibility.

Definition 1b:

x is true if and only it corresponds to a state of things that are the case or that are obtainable.

x is false if and only it corresponds to a state of things that are not the case or that are not obtainable.

In this case, the above example can be reformulated as follows: snow is white if and only if snow whiteness is possible. Note that definition 1a is Aristotelian in the sense that this definition does not mention abstract properties, as definition 1b does, which is platonic in nature, since such properties are accepted, i.e., the property of whiteness.

It can be said that the truth consists of a relationship with a fact or a state of things. Such a relationship can be of correspondence or conformity, but historically there has also been congruence, agreement, representation, reference, satisfaction, etc., not only with facts or things, also with portions of reality such as conditions, situations, events, objects, sequence of objects, sets, properties, and so on.

Before continuing, a brief historical review will show how the correspondence theory of truth is implicit in the way several major philosophers conceived the concept of 'truth'. In his *Metaphysics*, Aristotle (384-322 B. C.), defined 'truth' as:

To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true (*Metaphysics*, 1011b25).

In other words, what Aristotle claimed is what makes true or false what we 'say', is the being – or not being – of things. In Aristotle's words:

We say that things are false when they do not exist or because their appearance does not exist either. A false *explanation*, as a false one, refers to non-existing objects. For the above, any explanation is false when applied to something other than what makes it true; for example, the explanation of a circle is false when applied to a triangle (*Metaphysics*, 1024b25).

For Aristotle (1999 [1690]), the statements issued on reality may be true or false:

The truth or falsity of a statement depends on the facts and not on the power of the statements themselves to admit contrary qualities (*Categories*, 4b5).

In Aristotle's concept of 'truth' the correspondence that has been characterized by definition 1a is intrinsic because what we 'say' is true when somehow, yet to be defined, it corresponds to the being of a thing. Almost a millennium and a half after the existence of Aristotle, during the Middle Ages, the philosopher and theologian Saint Thomas Aquinas (1225-1274), who was an apologist of the 'Philosopher' (as Aquinas refers



to Aristotle), wrote his classic book *Summa Theological* (also known as *Summa of Theology*) dated between 1258 and 1265. In this book, Aquino took up the question about the concept of ‘truth’ in question 16 precisely entitled ‘on truth’. In Article 1, question 16, he wrote:

Instead, there is what the Philosopher says in VI *Metaphys: True and false are not in things, but in understanding them* (2001, Aquinas, Article 1, Objections 3).

And he added:

It must be said: As was already mentioned (a.1), the real thing, in terms of its first reason, is in the understanding. As all things are true as they have the proper form of their nature, it is necessary that understanding, as known, be true as soon as it has the image of the known, that is the form of understanding as is known. And so, truth is defined as the adequacy between understanding and object. Therefore, knowing such an adequacy is knowing the truth (2001, Aquino, Article 2, Objections 2).



Note that Aquino’s concept of ‘truth’ also has an intrinsic correspondence of truth in defining it as the ‘adequacy’ between understanding and object. However, his notion of truth differs from that of Aristotle in terms of what corresponds to or adapts to reality or objects in the world. According to Aristotle, ‘say’ is a verbal act, which corresponds to reality; while Aquino emphasized ‘understanding’ as a mental process. During modernity, Baruch Spinoza’s notion of truth (1632-1677) no longer refers to ‘understanding’ as Aquino did; it refers to ideas:

The true idea must be in agreement with what is conceived by it (Ethics, of God, axiom vi. My emphasis)

Indeed, Spinoza did not clarify whether the idea of ‘true ideas’ is something external to the ideas themselves, i.e., whether it is referring to an external world or some kind of link between ideas. John Locke (1632-1704), in his *Essay on Human Understanding*, tried to be more precise by distinguishing two types of propositions and two types of signs:

Then the truth itself belongs only to propositions: there are two types, mental and verbal; just as there are two kinds of signs that we commonly use, namely, ideas and words [...] when ideas are placed together or separated into the mind, in the way things they represent agree or disagree, it is what I call mental truth [...] But, then, propositions will contain a real truth, when those signs have been united according to our ideas, and when those ideas are such that we know they are capable of

having an existence in nature (Locke, 1999 [1690], 4.5.2, 4.5.6 and 4.5.8. My emphasis).

As can be seen, Locke also defends a type of correspondence truth by asserting that propositions, understood as the signs of ideas, are sensitive to an 'existence' in nature. The same was said by Gottfried Wilhelm Leibniz (1646-1716), who argued that truth consists of a kind of *connection* between the parts of a proposition:

[...] in truth there is also a connection between the terms, i.e., there is truth, even if such truth cannot be reduced to the principle of contradiction or necessity through an analysis of their identities [...] It is true that there is a connection between the subject and the predicate in every truth (Leibniz, 1989 [1690], p. 29).

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Subsequently, David Hume (1711-1776) in his *Research on Human* made a fundamental distinction between two kinds of objects of human reason, namely, the relationships of ideas and facts, in order to understand the truth:

Sciences of Geometry, Algebra and Arithmetic are part of the first type of objects [...] These propositions [first] are discovered by the mere operation of thought regardless of whether [such objects] exist in the universe. Even if there is never a circle or triangle in nature, these truths, demonstrated by Euclid, will retain their certainty and evidence. The facts [on the other hand] which are the objects of human reason of the second type, are not determined in the same way [as those of the first type] nor is our evidence of their *truth*, however great it may be, of a nature similar to the previous one. The opposite of each fact is possible because it cannot imply a contradiction and is conceived by the mind with the same ease and clarity as if it were *conformed* with reality (Hume, 2007 [1748], Section IV, Part I, 25. My emphasis).

According to Hume (2007 [1748]), facts — and their potential and opposite imaginaries — also imply a relationship of correspondence or 'conformity' with reality, however, the evidence of 'truth' is contingent and unnecessary as is the case with the objects of mathematics. Finally, there is the position of another important philosopher, Immanuel Kant (1724-1804), who in his *critique of pure reason* also spoke about correspondence truth as:

What is the truth? The nominal definition of truth is the concordance of knowledge with its object, it is granted here and assumed. But it is clear that, since in such a criterion, all content of knowledge (reference

to its object) is abstracted and the truth concerns precisely that content; it is impossible and absurd to ask for a sign of truth of that content of knowledge, and is therefore not possible to give a sufficient, and at the same time universal, characteristic of truth (Kant, 2000 [1787], A58, B83 and A59).

This historical review shows that for a long period of time, most philosophers defended, in one way or another, what is now known as the ‘correspondence theory of truth’. It was not until the late nineteenth and early twentieth centuries that some philosophers who were interested in the subject began to problematize this theory in a ‘systematic’ way. Indeed, in the notions of ‘truth’ created by philosophers that have been revised so far, there is no consensus, for example, on what exactly corresponds to reality, whether it refers to assertions, understanding, or propositions. Certainly, these can also be ideas, beliefs, thoughts, judgments, statements, sentences, etc.

Because of the latter, it has been proposed to use a neutral term, namely ‘truthbearer’ to refer to each of these possible entities. On the other hand, any fact, event, phenomenon, situation, process, thing, object, sequence, set, property, etc., that makes a truth bearer be true, has also been called, in a neutral way, ‘truthmaker’. Schematically, the following table represents the three constituent elements of the correspondence theory of truth:

Table 1. Correspondence theory of truth

Truthbearer	Relationship	Truthmaker
Belief	Correspondence	Fact
Thinking	Conformity	Event
Idea	Congruity	Phenomenon
Judgment	Agreement	Thing
Enunciated	Representation	Set
Assertion	Meaning	Object
Statement	Reference	Property
Proposition	Satisfaction	Process

Source: Own elaboration



Some problems of correspondence theory of truth and its relationship to science

The correspondence theory of truth not only shows a problem of consensus of what corresponds to reality. It also shows a problem with regard to how a real doer ‘makes’ a real bearer¹. Of course, there are several debates surrounding problems of a more general nature exhibited by the correspondence theory of truth².

This text will develop a specific set of problems that exhibit the correspondence theory of truth in relation to the scientific field. In particular, three criticisms of this position will be analyzed, (i) that it is dark and mysterious; (ii) that it is too limited to explain certain aspects in some areas of scientific research; and (iii) that it appears to be a self-complacent stance.

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Argument (i): The correspondence theory of truth is dark and mysterious

According to this argument³, the correspondence theory of truth is dark because, if the correspondence referred to implies some kind of similarity between the bearers and the real doers, it turns out that the former – the real bearers – do not resemble anything that exists in reality like things, facts or phenomena. Given the mental (beliefs, thoughts, ideas, judgments) or linguistic (statements, assertions, statements, propositions) nature of the truth bearers, they cannot resemble anything ‘real’ in the world, whose ontological – or metaphysical – nature has certainly another nature. In other words, if there is any similarity between a belief or an idea and something else, it could only be another belief or idea. If this argument is correct, there is no connection between the truth bearers and the truth-doers as suggested by the correspondence theory of truth.

On the other hand, the correspondence relationship is not only dark; it is mysterious, since it seems to involve the most distant regions of space and time. Certainly, one might wonder in this regard how to explain the correspondence from the point of view of a temporal relationship between a real bearer and a far-truth doer in time, as is the case of historical or archaeological events.

Argument (ii): The correspondence theory of truth is too limited

Two possible definitions of the correspondence theory of truth (definitions 1a and 1b) were provided in the previous section. Although both definitions apply to certain domains of scientific knowledge, they do not apply to other domains such as Ethics. For example, because there are no ‘moral facts’, there is no real doer for this type of discipline. On the other hand, the correspondence between a judgment and a specific ethical virtue such as ‘righteousness’ might be, in principle, relative to specific ethical systems, leading to a type of epistemic relativism; but, moreover, it would remain in the scope of abstract ideas such as whiteness, i.e., it would possibly satisfy definition 1b, but not 1a.

Likewise, correspondence theory of truth seems to be too limited by not making any distinction between falsehood and the absence of truth, a crucial distinction to explain certain claims that are neither true nor false. This is the case with statements that presuppose the existence of things that do not actually exist. Likewise, this theory also does not explain certain paradoxical truth bearers, who for their understanding, require the notion of ‘clusters of truth’, whose statements would be both true and false⁴. This last point will set aside the first distinction between falsehood, and the absence of truth will be deepened. For this, here is an example drawn from the history of Chemistry.

In the chemical revolution of the 18th century, Joseph Priestley (1773-1804) used language containing terms such as ‘phlogiston’ or ‘principle’, which is now considered to be of no reference in the natural world. Although later, Antoine Lavoisier (1743-1794) used a theoretical framework containing expressions such as ‘oxygen’ and ‘element’ whose references correspond, as Philip Kitcher says to “natural classes that Priestley could not identify” (Kitcher, 1993, p. 97); the fact is that the concept of ‘phlogiston’ does not refer to any element or substance existing in the world. Hence, sentences containing terms that do not designate anything (called empty sentences) express propositions that are neither true nor false, i.e., these enter into what can be called a ‘gap of truth values’. Here is an example to clarify the point of this type of semantic gap:

(P) “Kant’s wife was protestant.”

According to the correspondence definition 1a ‘x is true if and only if it corresponds to a fact’ while ‘x is false if and only if it does not correspond to any fact’. In this case, x would be equivalent to ‘being Kant’s wife’ and the fact x should correspond to ‘being protestant’. Hence, the

proposition ‘Kant’s wife was protestant’ would express a falsehood only in the case that the proposition ‘Kant’s wife was not protestant’ is true. However, since Kant was a single man, it is not true that (P) nor is the denial of P (not P) true. When a proposition is neither true nor false, it is then an empty sentence⁵.

For the above, it can be stated that any proposition that affirms or denies anything about the phlogiston will be an empty proposition whose semantic content cannot express any reference in the natural world.

Argument (iii): The correspondence theory of truth is self-complacent

It has been mentioned that the correspondence theory of truth asserts that a truth bearer x corresponds to a truth doer z located in some space-time region of the natural world. This relationship can be expressed as follows:

“ x corresponds to z ”.

One of the questions that can be asked to this relationship is: How can be confirmed that there is indeed an optimal correspondence, i.e., complete, total and not empty between x and z ?

The answer to this question must, in principle, avoid a kind of confirmatory complacency or, in other words, avoid circular argument that makes it possible to confirm the correspondence relationship between x and z in an ‘objective’ way. For the above, a confirmatory instrument is required ‘beyond’ the relationship. In philosophical literature, this confirmatory instrument is often referred to as the ‘eye of God’. In the following lines, some of the problems presented by the ‘eye of God’ argument for the correspondence theory of truth will be analyzed.

Certainly, a correspondence theory of truth requires, for the sake of objectivity, a confirmation mechanism that allows corroborating the supposed correspondence between the two domains x and z . This objectivity can only be achieved if the confirmation mechanism is independent of both domains. However, in the case of scientific activity, scientists themselves are the ones who establish, from a theory, the type of entities acceptable to the theory—or group of theories—called a paradigm, tradition, research program, or theoretical holon. But it is also the scientists themselves who specify how such entities can be confirmed, so such a mechanism seems to be a circular argument.

However, it could be argued that scientists act with full honesty and epistemic objectivity. Nevertheless, epistemic biases are not always



conscious or voluntary. There are also biological and cognitive reasons that risk the objectivity of the confirmation process by scientists such as visual incompetence or lack of scientific training, among others. The fact is that, if scientists take this kind of ‘involuntary’ epistemic biases seriously, there seems to be no entirely sure observation, free from the danger of misinterpretations.

Hence, the notion of the ‘eye of God’, as a confirmatory ideal, is relevant in pointing to the need for a neutral and independent criterion to confirm (or, if desired, verify) the extent to which both domains x and z actually correspond.

At this point, it could be argued that the correspondence between two domains may certainly not be total and free of uncertainty; in reality correspondence can occur in degrees, which allows to construct a notion of non-absolute correspondence, as in the case of some astronomical scientific propositions. For example, today it is known that the *approximate* distance between our planet and the Sun is 149 600 000 km. Of course, a notion of absolute correspondence between the Earth and the Sun assumes that there is indeed an objective distance—or real—at a specific time t_1 between Earth and the Sun, and that the increasingly accurate calculation of this distance depends on factors such as the development of more advanced measurement technology. Hence, from this position, correspondence is becoming more precise. Unfortunately, although this stance eliminates the requirement for absolute empirical corroboration, it does not evade the problem that, even by accepting that correspondence can occur in degrees, the degree of correspondence – or approximation – between the two domains x and z must be established.

What is interesting to note from both postures, which can be called absolutist and gradualist of correspondence, is that scientists, in both, are considered as ‘confirmatory agents’ of the truth bearers accepted in the framework of scientific research. According to Carl Hempel (1966), this confirmation process begins when scientists raise hypotheses that are used to make predictions about scientific phenomena. If the experiments show that the predictions are ‘true’, or from a less strict epistemic point of view, that they are ‘empirically adequate’, then the hypothesis is said to have been ‘confirmed’. This latter problem is interesting given that it seems essential to a correspondence theory of truth to explain how, from a logical and empirical point of view, the supposed correspondence between the doers and the bearers is confirmed; this topic will be discussed in depth in the next section in the context of current *scientific realism*.



Confirmation problems in the framework of scientific realism

Scientific 'confirmation' faces two types of problems, some empirical and some logical. Here, some of the logical problems and their implications for the correspondence theory of truth⁶ will be discussed. One of the philosophical positions that defends the thesis of scientific confirmation emerges from the so-called *scientific realism*, so the idea is to start this section by making some conceptual clarifications about the realistic stance. *Scientific realism* is made up of several heterogeneous theses that share a common characteristic, namely the acceptance of the entities, organisms and processes that are not observed (many of them unobservable) and that are postulated by science. In this sense, it is reasonable to believe that scientific claims about these entities, organisms, and unobserved processes are true or at least approximately true.

Three types of closely related commitments have been identified, which can be defended from different realistic positions. Such commitments are ontological, semantic and epistemological. *Ontological commitments* postulate the existence of a natural world independent of human mind⁷. In this sense, *ontological scientific realism* defends the idea that the natural classes that describe the best scientific theories exist independently of the scientist ability to know the natural world. On the other hand, *semantic commitments* hold that most of the statements that science makes about the natural world contain values of truth, so the best scientific theories must be kept as true, or at least approximately true, in the literal sense of these terms⁸. Defending this type of *semantic scientific realism* implies arguing about the observational terms and theoretical terms that postulate the best scientific theories. Finally, epistemological commitments defend the idea that the scientific assertions that make this type of theory, being true, provide reliable knowledge of the natural world, so that, for advocates of epistemological scientific realism, theories that show empirical and predictive success are, by this fact, confirmed⁹.

Each of these realistic versions argue with different anti-realistic postures. For example, the ontological thesis tries to oppose postures such as defended verificationism, among others, by Michael Dummett (1993) and Hilary Putnam (1990, 1981); those who deny that it is possible to draw a clear dividing line between what exists in the world (the truth doers) and what our best epistemological practices establish as real (the truth bearers). The semantic thesis, for its part, opposes skeptical positions such as defended *instrumentalism*, among others, by Chang (2004) and Laudan (1977). The latter argues that it is irrational to adopt

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truth as a coherent cognitive goal for scientific research because, among other reasons, it is not possible to know whether or not that goal has been accomplished. Chang, in turn, considers that science is a system of knowledge that is self-correcting and enriching in relation to different cognitive goals that science has historically pursued such as simplicity, productivity, congruence, accuracy, consistency, problem solving, explanatory power, or predictive accuracy; hence, postulating a single cognitive criterion as truth to defend a realistic stance on science seems to face historical problems¹⁰. Finally, the epistemological thesis is opposed to skeptical empirical versions such as *defended empirical constructivism*, among other authors, by Bas Van Fraassen (2002, 1980). In this regard, Van Fraassen (2002) considers of little cognitive importance whether or not the theoretical terms of a scientific theory are true because, among other reasons, it is not possible to confirm with full certainty whether such hypotheses are in fact true beyond empirical evidence. What really matters, the author argues, is whether or not such scientific theories are empirically appropriate (Van Fraassen, 1980).

As can be seen, the three types of commitments that can be made from different realistic positions – ontological, semantic, and epistemic – are intimately related to each other. Some logical arguments will be presented with *epistemological scientific realism* in mind, representing a challenge to a finished notion of confirmation that, as has already been pointed out, seems essential to a correspondence theory of truth that seeks to explain how the supposed correspondence between the doers and the bearers of truth is confirmed. It will be presented from the simplest to the most complex.

(a) The fallacy of the affirmation of the consequent

If the empirical predictions made by science have the logical form: if $(P \rightarrow Q)$. Where P represents general laws, central hypotheses, auxiliary hypotheses, auxiliary assumptions, initial conditions, the *ceteris paribus* clauses, etc., used by a theory to establish an empirical prediction; and it turns out that this is the case of Q, this prediction commits, strictly speaking, the fallacy of affirmation of the consequent. So, no Q can confirm P without falling into this fallacy. But the other way of this conditional is also problematic:

(b) The regression to infinity or the problem of the epistemic foundation of knowledge

If the empirical predictions made by science have the logical form: If $(P \rightarrow Q)$, it is always possible to ask for the justification of P . Such justification cannot be part of any element of Q , since it is Q which is intended to be justified. Therefore, R must be added, and: if $(R \rightarrow P \rightarrow Q)$. And now, the justification of R would be: if $(? \rightarrow R \rightarrow P \rightarrow Q)$ *ad infinitum*.

(c) The raven paradox

This problem is known as the ‘Raven Paradox’ and was proposed by Hempel (1945). The following proposition: (1) ‘All ravens are black’, is logically equivalent to the proposition: (2) ‘All non-black things are non-ravens’. So, a “red chair,” which is certainly something that is not black and is not a raven, is positive evidence for (1). From a logical point of view, this is correct. However, intuitively it can be thought that something is not right with this argument. Finding a red chair cannot be evidence in favor of proposition (1)¹¹.



(d) The argument of pessimist induction¹².

According to this argument, whatever the supposed epistemic virtues of scientific theories are, as is the virtue of being true, there is no inductive guarantee that such virtue will be preserved during the theoretical change of science, for example, during scientific revolutions. Historically, several scientific theories of the past that proved to be untrue can be traced despite exhibiting remarkable empirical success, as is the case with the phlogiston theory mentioned above, which showed some success with regard to some chemical reactions, such as oxidation and reduction, according to Priestley (1783). Therefore, many of the core terms of today’s best scientific theories could have the same result and not display a genuine reference in the natural world. If this argument is correct, several of today’s best scientific theories may not have a real doer to make their core terms true.

(e) The epistemic context argument

The confirmatory test to which a scientific proposition can be scrutinized, more specifically, a hypothesis (H), has a conditional nature of the type:

$BK, (IC \rightarrow E)$

Where BK refers to previously accepted knowledge, IC denotes the set of initial conditions that have been previously established by the theory and E shows evidence in favor of H. It is important to note that H under evaluation is usually based on certain auxiliary hypotheses (HA) that link it to the evidence. However, even when a specific H can be considered to be ‘well confirmed’, it is not possible to assume it as ‘true’, because the empirical support of H is relative not only to BK and IC; it is also related to HA which, in turn, can be tested from other contexts. If this is the case, what is considered as H or as HA will depend on the epistemic context in which these variables arise, because both H and HA may be the hypotheses that are under analysis in different contexts. If this is so, that is, if the type of truth bearer (or hypothesis) for which reliable evidence is available is not clear, it can hardly be established what exactly that evidence is *properly* justifying, and thus confirming.

(f) The argument of circular argument

As mentioned, some advocates of realistic science postures have argued that the empirical success of the best scientific theories is a feature in favor of scientific realism. It is argued that entities postulated by such theories exist or have a reference in the natural world. Hence, it is argued that the empirical success of science—in the sense of giving detailed explanations and making precise predictions—is a feature of the supposed empirical confirmation of such theories. It is also argued that the theoretical terms — i.e., the terms with which unobserved entities are postulated and that have most of the finished scientific theories, should be thought of as genuine referential expressions, since the scientific theories are highly confirmable and, in fact, they are often inductively confirmed as true approximations by interpreting scientific evidence in accordance with ordinary methodological norms. Let us look in detail at one of the arguments in favor of this idea.

According to Bird (2007), the main cognitive goal pursued by science is “knowledge production” (p. 64). In fact, according to this author, science progresses by accumulating known scientific propositions. The concept of ‘knowledge’ advocated by Bird follows the traditional scheme of ‘true justified belief’, so there is genuine scientific knowledge when, in some way, yet to be defined, the truth content of scientific propositions, i.e., of the truth-bearers, has been justified through an epistemically reliable methodology.

However, ensuring that a scientific proposition is 'known' implies that it is possible to have, in principle, a non-problematic idea of what knowledge in general and scientific knowledge are; but, the concept of 'knowledge' cannot be defined simply as 'true justified belief', because there may be beliefs that are 'accidentally true'. Bird (2007) accepts that these 'accidental' cases would not contribute to scientific knowledge. For the above, the only scientific propositions that can be 'known' are those that are sufficiently well-founded by the evidence, i.e., propositions that have somehow been properly confirmed.

Thus, this chain of scientific knowledge can be expressed as: (i) scientific progress exists when knowledge accumulates; (ii) knowledge accumulates when scientific propositions are true; (iii) scientific propositions are true when they are sufficiently justified; (iv) this type of justification is obtained by a scientific methodology that provides reliable evidence; (v) reliable epistemic evidence is obtained when scientific propositions are properly confirmed. But when can one claim that a scientific proposition is properly confirmed? In order to answer this question, it seems that we must go back to subparagraph (iv), i.e., we must reaffirm once again that confirmation is linked to the possession of reliable evidence, which seems to be a circular argumentative strategy. If this argument is correct, this stance suggests – tacitly – that the sufficiently well-founded evidence that can be possessed in favor of a scientific truth bearer is actually equivalent to asserting that such a bearer has been properly confirmed. Thus, the argumentative movement that this position makes from subparagraph (iv) to subparagraph (v) can be questioned.

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Conclusions

All of these logical problems presented by the notion of 'scientific confirmation' suggest that scientists are not, after all, confirmatory agents; they are probabilistic agents, i.e., agents seeking to calculate the probability with which a truth doer makes a true bearer of truth emanating from scientific discourse.

A probabilistic agent could operate as follows: hypotheses are put forward when considering its probability given the available evidence. This relationship is expressed as the conditional $P(H/E)$ probability. One way to calculate this probability is using Bayes's theorem (conditional probability of a random event).

An interpretation of this theorem is $P(H/E) = P(H) \times P(E/H) / P(E)$. This indicates that the subsequent probability of a hypothesis (H), given the evidence (E), is calculated by multiplying the previous probability of (H) by the probability of the evidence (E), given the hypothesis (H), and all is divided by the probability of the evidence (E).

One of the attractions of this theorem is that (H) is more and more likely to the extent that it makes the evidence more likely. So, a probabilistic agent takes into account all relevant evidence, then calculates the values for $P(E)$ and $P(E/H)$ considering a previous $P(H)$ value, and culminates by calculating the $P(H/E)$ values. Thus, from two incompatible hypotheses, probabilistic agents will prefer (H) with the highest probability.

However, this probabilistic strategy of scientific confirmation is also questionable. It also appears to be too limiting. For example, ones might wonder what is the interpretation of the probability of $P(H/E)$ for a causal hypothesis of unobservable entities that science postulates? It is known that probability has its clearest expression as frequencies in a population of observable events, so that the frequency of a die falling by 3 is $1/6$. But what likelihood can be given, for example, to the idea that the extinction of dinosaurs has been caused by the collision of an asteroid in the Chicxulub area, Yucatan, Mexico and not by another event? Certainly, the causal hypotheses of unobservable and distant events in time, such as the extinction of dinosaurs, are also problematic for the probabilistic strategy; however, it suggests future lines of research for the construction of a finished notion of scientific confirmation, which is essential for the better understanding of the correspondence theory of truth.

Notes

1. For an analysis of the various philosophical implications of bearers and doers, see Jago, 2018 chapters 3, 4, 7 and 8; King, 2018; Dragulinescu, 2018; Frápolli, 2013 Chapter 5; Baron, 2013; Dragulinescu, 2012; Schulte, 2011 and Niiniluoto, 2004, among others.
2. For a review of various arguments for and against the correspondence theory of truth, see Wolensky, 2019 chapter 9; Sher, 2015; Rasmussen, 2014; Asay, 2013 chapter 4; Licata, 2011; Niiniluoto, 2011; Newman, 2004; Underwood, 2003; Fernández, 2001 and Field, 2001 chapter 7, among others.
3. For a more detailed analysis of this argument, see David, 2016, pp. 22 and 23.
4. For a deeper analysis of the notion of 'truth clusters', see Weber et al., 2014.
5. For a detailed review of this type of semantic gap, see Künne 2003, Chapter II.
6. Elsewhere, I analyze some of the empirical problems faced by the notion of scientific 'confirmation' (see Islas, 2014).

7. To deepen the issue of the independence of the human mind from the natural world, see Fry, 2020; Frolov, 2018; Nicolai, 2015; Colyvan, 2008; and Cocchiarella, 2007, among others.
8. For an analysis of the distinction between what is true and approximately true, see Khalifa, 2020; Cevolani & Tambolo, 2019 and 2012; Andreas, 2016; Da Costa & French, 2003 and Niiniluoto, 1999, among others.
9. For an analysis between empirical success and confirmation, see Saatsi, 2018 and Psillos, 2009, among others.
10. Elsewhere, I analyze the different cognitive goals and values pursued by science and its implications for an integral notion of scientific progress (see Islas, 2015).
11. This argument has been extensively developed by several authors interested in the subject, see Goodman, 1979; Schiller, 2012; Maher, 2005, among others.
12. Elsewhere, I analyze the debate on the argument of pessimistic induction from the point of view of the philosophy of today's science (see Islas, 2019).

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POSTMODERNISM AND REALISM IN THE APORIA OF POST-TRUTH

El posmodernismo y el realismo en la aporía de la posverdad

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Abstract

In recent decades, the problem of post-truth has emerged. Values such as fairness, objectivity, and critical dialogue have become more difficult to achieve. Various characteristics are associated with this, such as the emergence of new technologies and a new era in political relations with the rise of fundamentalism and populism. Besides, the reference to postmodernism is always commonplace in the bibliography on the subject. Considering this, the article's main objective is to philosophically analyze the theoretical foundation of post-truth, the postmodernism. From the methodological point of view, this theoretical study will take the interpretive approach as a reference. Interpretive hermeneutical criticism has been combined with a documentary analysis of the main works that address this problem. The article explains the main characteristics of the concept, considering the current and notorious interpretation, and then interprets the position that criticizes postmodernism as the theoretical basis of the post-truth era. It concludes by defining that the relationship between post-truth and its theoretical foundation has a dogmatic and contradictory character since it confronts subjectivist relativism with the dogma of a realist metaphysics.

Keywords

Truth, post-truth, postmodernism, realism, political philosophy, epistemology.

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Resumen

En las últimas décadas ha emergido el problema de la posverdad. Valores como la imparcialidad, la objetividad y el diálogo crítico, se han vuelto más difíciles de alcanzar. A lo anterior se asocian diversas características como la emergencia de nuevas tecnologías y una nueva era en las relaciones políticas con el aumento del fundamentalismo y el populismo. Además, la referencia al posmodernismo es siempre un lugar común en la bibliografía sobre el tema. Tomando eso en cuenta, el objetivo principal del artículo es analizar filosóficamente el fundamento teórico del concepto de posverdad, el posmodernismo. Desde el punto de vista metodológico, este estudio teórico tomará como referencia el enfoque interpretativo. Se ha conjugado la crítica hermenéutica interpretativa con el análisis documental de las principales obras que abordan este problema. En el artículo se explican las características principales del concepto, teniendo en cuenta la interpretación corriente y notoria, para luego interpretar la postura que critica al posmodernismo como base teórica de la era de la posverdad. Se concluye definiendo que la relación entre la posverdad y su fundamento teórico tiene un carácter dogmático y contradictorio, puesto que enfrenta al relativismo subjetivista con el dogma de una metafísica realista.

Palabras clave

Verdad, posverdad, posmodernismo, realismo, filosofía política, epistemología.

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Introduction

If beginning from the fact that educational practice goes beyond the professor's role, a promising beginning is made to the study of the relationship between truth as a philosophical concept and education as a human activity based on it. Likewise, science, the basis of the educational process, is an activity that presupposes philosophical knowledge and paradigms. Although both ideas are taken for granted among intellectuals and the scientific community, that does not seem to be the case in some sectors and processes in contemporary societies.

According to Englebretsen (2006) over the past few decades, creative knowledge and practice are at risk by the problem of post-truth. Values such as accuracy, impartiality, and mental openness have become more difficult to achieve, and although none of these phenomena are historically new, as Kavanagh and Rich (2018) suggest, their current scope and scale may be more extreme than before.

Barzilai and Chinn (2020), when talking about the importance of criticizing the post-truth, show four problems. Post-truth implies, first, not knowing how it is known; second, a considerable lack of importance for the truth itself; third, not agreeing on how to know and, finally, the emergence of fallible forms of knowing. All of these lines have implications in education and other areas of society. Indeed, since the emergence of post-truth as a term in 2016 (BBC News), countless papers have

appeared addressing the role of education, including Britt et al. (2019), Buckingham (2019), Darner (2019), Kendeou (2019) and Pupo (2014).

From this point of view, there is an interest in knowing whether students and teachers are prepared to deal with truth-related phenomena and how to improve their preparation. However, this does not suggest that education is the only way to address these problems. On the contrary, an effective response is likely to require social, technological, educational and purely philosophical measures, as suggested by Lewandowsky, Ecker & Cook (2017), Wardle & Derakhshan (2017) and Feinstein & Waddington (2020). Given this last need, this article uses philosophy and its response to the problem of post-truth.

According to Braun (2019), a tentative definition of the term indicates that it:

(...) is primarily a sorting device, a concept that serves as a means to create order in a complicated world and make sense of what is happening. Like any sorting device, it is contingent and full of values, and it sheds light on some aspects of reality while obscuring others (p. 1).

Similarly, Lee McIntyre begins his influential post-truth research (2018) by saying that it is an umbrella term. Moreover, he adds that the first step to understand post-truth is by knowing its genesis. However, genesis cannot be understood only from the temporal point of view as he thinks, but also from the logical-philosophical point of view.

It is also associated with several features such as the emergence of new technologies, massive data consumption and processing, the increase in the use of social networks, and a new era in political relations. All these ideas will be analyzed in this article; however, special attention will be paid to the only idea that is steady in the group of characteristics, its theoretical foundation: postmodernism.

According to Englebretsen (2006), this trend of forgetting the truth is composed of:

(...) new thinkers who have spread this virus (often innocently, but with the same intentionally and cynically frequency) and have found a more receptive (but not only) entourage in the liberal faculties of the academy. As with many of its biological counterparts, this disease has mutated in a variety of ways (p. 7).

Contrary to this idea, it is thought that there is more than a simple manipulation or emotional interference behind the concept of post-truth motivated by post-modernism with vague definitions. Therefore, analyz-



es of other sciences always refer to the post-truth regime, the post-truth era, the post-truth paradigm, narratives, among other formulas that indicate that its incidence is much greater and complex.

If philosophy is a knowledge that deals in the first instance with the concepts and problems, post-truth should be its priority. But when comparing the advances in this area with other areas of knowledge, it is easy to see that most of the articles and publications are from the communication sciences, journalism or political sciences. Almost always immediately assuming the identity of a term that is still changing.

Taking into account these ideas about the concept and the extensive reality that post-truth encompasses, various problems might emerge. However, observing the absence of analysis that focuses on its theoretical foundation, an attempt will be made to answer the following question: What kind of philosophical relationship exists between the concept of post-truth and postmodernism as its theoretical foundation, according to the current interpretation of that term?

As observed, reference is made to a “current interpretation,” which is only the most widespread and notorious interpretation of the post-truth, with authors such as Keyes (2004), Englebretsen (2006), Calcutt (2016), McIntyre (2018) or Brahms (2020). From the above, the main objective is to analyze philosophically the postmodern theoretical foundation of the concept of post-truth, according to the current interpretation of the term. The article first explains the main characteristics of the concept, taking into account the current and notorious interpretation, and then it interprets the position that criticizes postmodernism as the theoretical basis of the post-truth era.

From a methodological point of view, this theoretical study uses as a reference the interpretative approach, justified by the need to use the analysis about the concept studied. Interpretative hermeneutical criticism has been combined with the documentary analysis of primary and secondary papers that address this problem. As a hermeneutical theoretical study, the important thing is not to question or describe interrogation essences enclosed in themselves, but, in addition, to contextualize in order to arrive at new stages on the question raised. Classical and contemporary works have been used as references; scientific articles and major books have been consulted in several languages present in databases, repositories and academic search engines.

The importance of the topic is based on the need to understand this process; first, from a conceptual point of view. Philosophy must be the main responsible for this task, since it points to possible and future



ethical developments. In addition, beyond theoretical development, it is believed that ideas relevant to other areas of knowledge that use the term to explain subjects' new relationships with the digital and technological environment can be used.

Finally, there is a social importance that must not be circumvented. The years 2020 and 2021 have been defined as the most difficult years for humanity in recent decades. As Ortega (2021) and Guerra (2021) mention, the pandemic has imposed a social challenge, but also an existential and ontological challenge. This has to do with different events that we will not review; however, one of them has been present at all times, the post-truth. For instance, the dissemination of false news about COVID-19, to vaccination campaigns. All this should lead the researcher to ask the philosophical question about the truth in these new processes. This will have a significant impact on global education in the twenty-first century.



Definition and explanation of the concept

The word 'post-truth' emerged in 2016 when the Oxford Dictionary named it Word of the Year. According to the publication in its digital version, it is "an adjective defined as related or denoting circumstances in which the objective facts are less influential in the formation of public opinion than appeals to emotions and personal beliefs" (p. 1).

There are also more definitions in other languages:

- According to the Dictionary of the Spanish Royal Academy (2020), the post-truth is a "deliberate distortion of a reality, which manipulates beliefs and emotions in order to influence public opinion and social attitudes. Demagogues are masters of the post-truth" (definition 1).
- According to Larousse (2020), it is a "concept according to which we have entered a period (called the post-truth era or post-factual era) in which personal opinion, ideology, emotion and belief triumph over the reality of facts" (definition 1).
- According to Cambridge Dictionary (2020), it is an adjective "in relation to a situation in which people are more likely to accept an argument based on their emotions and beliefs, rather than one based on facts" (definition 1).

While in the Anglo-Saxon versions the loss of the fact is more unfortunate, in the French and Spanish definitions facts are less important

and are assumed as a more subjective phenomenon that falls to the misuse of opinion, ideologies or emotions.

Despite this subtle difference, there is an absolute concern in all cases for the interference of emotions and personal beliefs in the interpretation of facts. The latter being the element that is indirectly or directly always referring to: the disconnection or the wide gap between the subjective and the objective, the internal and the external, the truth as correspondence to the facts and what is true 'for me'.

Before its use in dictionaries, the first time the term 'post-truth' was used was in the text *A Government of Lies* (1992), written by the Serbian-American playwright Steve Tesich. In his article, the author criticized the American public for submissively accepting the lies of Bush administration and deciding to live in a world where truth is no longer relevant: "In a fundamental way, we, as free people, have freely decided that we want to live in a post-truth world" (p. 12). After that, the term reappeared in 2004 with Ralph Keyes' book *The Post-Truth Era: Dishonesty and Deception in Contemporary Life* (2004).

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Theories of Truth, Philosophy, and Science

Any philosophical reflection on the post-truth presupposes a specific concept of truth. If the first involves a crisis, it is because it contains a variation of the second. Hence, in some contexts also refer to truth and alternative facts. Post-truth is immediately a deviation from a discourse considered straight, legitimate and sometimes even dogmatic.

According to McIntyre's work (2018), that minimum definition of truth is that of Aristotle (1994), who expressed: To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true". (p. 198). This is already relevant information in a twofold sense. First because it provides clues about the age of the problem. Second, because there is a base on which to begin thinking the post-truth. It is, in an abstract way, a deviation from the original meaning of what we mean 'it is'.

According to García-Bacca (2002), together with Aristotle, in the strict sense one should mention the poem of Parmenides, where a correct way of enunciating the self is already announced, in which the self and the thinking are the same, and an incorrect way that is described in his phenomenological poem. Socrates and the Sophists are in the same space of time. While Socrates defends an absolute, unique and immutable

conception of truth, the sophist philosophy defends its relativity, its possibility of transformation according to the functioning of λόγος.

For Borges Junior (2019), Protagoras would be a sort of precursor, because he speaks of man being the measure of all things, of which they are as they are, and of which they are not as long as they are. Plato, on the other hand, although he does not mention anything similar to the concept of post-truth, as expected in all classical thought, stands as a tentative point of comparison due to the problem of noble and ignoble lie in his work, as stated by Meza (2018).

In the West, there are several conceptions and projects of truth but it is not the intention of this paper to deal with all of them. However, there are at least three approaches that have been one of the most famous: The theory of truth as correspondence (CR), as coherence (CH), and pragmatics (PG). Following D'Agostini (2019) it is possible to define briefly that:

- CR: A proposition or belief p is true if and only if it corresponds to the facts.
- CH: A proposition or belief p is true if p is consistent with other propositions or beliefs that have been accepted (or are consistent with 'the totality' of our knowledge).
- PG: A proposition or belief p is true if it is useful to believe p (or if believing in p is successful).

Despite the different concepts and debates about truth, authors such as BonJour (2009) and Bourget (2014) claim that the theory purposely put into crisis from the post-truth era is CR. According to the above, post-truth would pose a problem for science, the media, and current politics, because the criterion of truth would be no more on the side of facts, but of the various interpretations that exist about facts. These stories would be based mainly on emotions that frame reality according to the intentions of each one.

A distinction must be made that has not always been found in studies on the subject, and it has to do with the space in which post-truth acts. Truth has been questioned throughout human thought, especially from science and philosophy. Plato, Aristotle and Parmenides have been mentioned, but the list is not over, it could be extended to R. Descartes, E. Husserl, M. Heidegger, L. Wittgenstein, B. Russell, K. Popper, T. Kuhn, among others. All these and others who are not mentioned, have had their own ideas about the concept of truth and have advanced novel questions. However, in no case should these questions of the truth be

confused with the post-truth. There is a notable difference between the functioning of science and philosophy, and the behavior of contemporary public opinion.

To illustrate, K. Popper is one of those thinkers who face the notion of scientific truth as correspondence. Part of his work is devoted to two problems, induction and scientific limit (1976; 2002). His approach was to replace induction with what is false. On the latter, the most relevant is the idea that universal theories cannot be induced from particular propositions. This refers to the problem of induction, as Popper (2002) has defined, and carries an implicit critique of positivism that draws any true value from the positive fact.

This is just one example of the collective and critical character of truth in the most general realm of philosophy and science and how it should not influence its value. Thus, questioning truth, although it can also be found in the most general knowledge about nature and society, it does not intend to deceive its audience.

However, something must be established; there is always a speech, in both cases, that appeals to some criterion of truth. Conspiracy theories, flat-earth organizations, or any other example, always contain a claim of truth as opposed to objective truth.

The claim is not the same as objectivity, and that is verifiable. The post-truth, although it appeals to the rigor of 'certain' laws and theories, to the objectivity of 'true' discourse, to the seriousness of 'certain' sources, or to coherence with pre-established narratives, it remains as an empty and purely formal discourse. Its content is almost always unverifiable and the alluded narratives are based on strictly personal beliefs.

Science establishes its own parameters of design, experimentation, publication, reproducibility and control of new knowledge; processes that are not found in the consumption and reproduction of content outside it, where there are not such verification and balance processes. For this reason, in addition to the distinction between pretense of truth and objective truth, there is an even clearer distinction between individual truth and collective truth, because the latter is based on criticism and the effort to build new theories for a common benefit.

Public sphere, media and new technologies

Other scholars define the problem from the new communicational parameters. Such is the case of Braun (2019), who says:

Social networks and related fragmentation of the public sphere, the formation of echo chambers, fake websites, bots and other instruments of systematic manipulation, anonymity, simplification, polarization and brutalization of language are generally considered a key component, or the main cause of post-truth policy (pp. 2-3).

This is reminiscent of Borges Junior (2019), who says that there is also a transformation in the heart of the public sphere beyond the use of new tools. The new media defines the public character from the private interests of those who dominate the tools, which means that the public is no longer the encounter for a dialogue, but a privatized space where the public occurs. It is “not only about thinking the notion of truth, but about building a certain idea of ‘common’ and how this construction has become more complex since the 20th century with the increasing and efficient participation of communication technologies” (Borges Junior, 2019, p. 508).

In fact, according to Hyvönen research (2018), American confidence in the mainstream media has fallen from 72% in 1976 (after Watergate/Vietnam) to 32% today. At the same time, the audiovisual media have almost completely replaced the written media. Daily circulation of newspapers in the US according to the same study, declined from 123.6% in 1950 to 36.7% of households in 2010.

There are other processes associated with it. The study by Schmidt et al. (2017) in the re-emergence context of post-truth as a term, analyzed the interactions of 376 million Facebook users with more than nine hundred media, and found that people tend to seek information that aligns with their views. Not only does this increase the reproduction of false news, but it reinforces the views that facts are becoming less and less important.

The research carried out by Barthel et al. (2016) for the Pew Research Center held just after the 2016 election, found that 64% of adults believed that false news caused much confusion, and 23% said they had shared invented political stories, sometimes by mistake and others intentionally.

As expected, the above examples have increased in recent years (2020-2021) with the expansion of coronavirus and the emergence of associated phenomena, such as the closure of entire cities, education institutions, confinement and its psychosocial effects, the economic crisis, the elections in the United States and the increase of conspiracy theories. In that post-pandemic universe, Facebook had 2603 million active users per month by September 2020, followed by WhatsApp, YouTube and Messenger. The total Internet population that year was 4.5 billion users, i.e., more than 300 000 stories per minute on Instagram, 64 444 people ap-



plying for a LinkedIn job, 150 000 messages posted on Facebook and \$1 000 000 spent by customers from anywhere in the world, according to Ali (2020). Undoubtedly, all these figures show a growing social interaction in networks and a process of virtualizing society. Both are ideal conditions for the increase in the phenomenon studied here.

With the virtual world, there is also the ease of using these tools, and the infinite possibilities of creating content with claims of truth, subjective and alien to collective rational criticism. It is easy to imagine that mistrust of facts is also the logical consequence that anyone can create, validate and disseminate content.

In addition, faith in public institutions is steadily declining, mainly for two main reasons. The first is the belief in a global elite that responds to its own interests without any control and balance. The second is the emergence of a perennial passivity based on the isolation of the subject in isolated topics.

This topic also undergoes a huge imbalance. Anyone who knows how these new technologies work is not able to generate a coherent critical discourse against the dangers they represent, and those who are able to articulate critical discourse do not know how they work. This is a gap that must be overcome if there is a real desire to understand how new technologies influence the production of real discourses.

Internet searches show results that are not casual, videos on YouTube are organized and shown according to these same algorithms, there is a constant appearance of promotions, and most of the leisure time is invested in a kind of unremunerated proletarian work: react and click. The subject pays double with his time, working physically and devouring himself to these new virtual rites. According to the South Korean philosopher Byung-Chul Han (2020), parties and celebrations are only valued from production, and the same is true of language, emotions, politics, truth, culture and society in general. Evidently, circumscribing the post-truth process to networks, Internet and new technologies have the risk of reducing the whole argument to a kind of technological determinism. On the one hand, this is not the situation for everyone; and on the other, it is not the case that technology involves only a loss process of identity and thus a disinterest in truth.

Falsehood, deliberate ignorance, lie, and post-truth

Beyond the doubts of post-truth against science, the rise of new technologies, and the changes that this has caused in the public sphere,



one might wonder whether that concept is also related to other discursive forms. This is what leads McIntyre (2018) to define a theoretical framework from which it can analyze the post-truth in relation to a group of similar processes.

First, the speaker often says things that are not true without wanting to say so. In this case, according to McIntire (2018), *falsehood* is present. Above it, there would be the “deliberate ignorance” when “we really do not know if something is true, but we say it anyway, without taking the time to find out if the information is correct” (p. 7). Then comes the *lie*, in which there is a clearly established intention. It is given great value because it is moved to a speech in which there is a clear will to deceive the interlocutor; and therefore, a level where responsibility has a different role.

There must be an audience when lying, a public to which one lies, even if the interlocutor is himself. Despite the contradiction, the liar is a social being, perhaps one of the most social because of the ontological need for an audience that certifies the disruption of reality. However, the audience certifies the lie by not knowing what is hidden. Thus, in a purely dialectical gesture, the liar and the deceived coexist in a relationship of identity and opposition that they cannot break. If this happens, the truth is uncovered and the game finishes. Is the post-truth a form of lie? Of course. But it is also clear that for some reason it has a different name.

The post-truth is not completely a lie because the difference is that: “in its purest form, the post-truth is when one thinks that the reaction of the audience actually changes the facts about a lie” (McIntyre, 2018, p. 9). Evidently, the greatest concern is that with the post-truth era, protected by the different elements mentioned above, the subject is able to alter the whole reality in their quest to convince the audience. It is not just about abandoning the facts, technological development, the increase of data consumption, the relevance of social media, or another specific feature, but a process that also includes subjectivity and the right to want to adapt reality to the story.

While in the lie the true discourse occupies a central place because it is hidden — and even the liar knows is lying, hence its paradoxical character —there is a cynical component in the post-truth:

Therefore, the post-truth is equivalent to a form of ideological supremacy, through which its practitioners are trying to force someone to believe in something, whether there is good evidence of it or not. And this is a formula for political domination (McIntyre, 2018, p. 13).

The problem must be extended to other debates that go through politics, but also by the theoretical basis of the post-truth: Postmodernism. McIntyre (2018) deepens on it when he says:

Even if right-wing politicians and other science deniers were not reading Derrida and Foucault, the idea opened its way to them: Science does not have a monopoly on truth. It is therefore not unreasonable to think that the right-wing is using some of the same arguments and techniques of postmodernism to attack the truth of other scientific claims that collide with their conservative ideology (pp. 139-141).

Likewise, Daniel Dennet in an interview with Cadwalladr (2017) for *The Guardian* has said that “What postmodernists did was really evil. They are responsible for the intellectual trend that enhanced the cynical being about truth and facts” (p. 3). On the other hand, from the point of view of Calcutt (2016), a little over thirty years ago some scholars had the task of discrediting the truth as a kind of great narrative: “Instead of ‘truth’, which should be rejected as naive and/or repressive, a new intellectual orthodoxy only allowed ‘truths’, always pluralistic, often personalized, inevitably relativized” (p. 2).

As observed, according to the current interpretation of the studied term, the definition finds its way and theoretical foundation only in postmodernism, giving the term an alleged origin in the pretended cultural analyzes that promote difference and anti-intellectualism.

The aporia of the post-truth: between postmodernism and realism

It has been mentioned that several authors who investigate and criticize the post-truth end this operation by alluding to postmodernism. This is immediately catalogued as its theoretical foundation.

The so-called postmodernism—from the point of view of authors such as Dennet (cited in Cadwalladr, 2017), McIntyre (2018), or Aylesworth (2015)—refers to a variable, heterogeneous, complex set of thinkers and themes belonging to the postwar generation. The vast majority, although not all French, are the most frequently cited representatives of the contemporary French movement. Contemporary French movement is understood as a generation of thinkers who are primarily known after the Second World War in France, or thinkers who take the latter as a reference, and who, receiving the influence of Husserl’s phenomenology, address topics as varied as subject status, culture, politics, and art. This brief



characterization is not superficial and is necessary to understand the real origin of the discourse being criticized.

According to Aylesworth (2015), authors such as K. Marx, F. Nietzsche, S. Freud, M. Heidegger, J. Lacan or J. Baudrillard present the theoretical bases of postmodernism. In one way or another, these thinkers are known as critics of modern notions, such as subject and object in a world that is completely mechanical. Postmodernists would take advantage of this criticism of the modernity of the self-centered and productive subject to clarify that reality is built and man is a prisoner of it.

The beginning of philosophical postmodernism is marked by the publication of Jean-François Lyotard's influential book *The Postmodern Condition* in 1979. The referral to Lyotard is invariant and important in this context, as it mentions topics that will always be remembered.

On the other hand, in addition to its founder, among the recurring ideas is Derrida's theory (2001) on literary deconstruction. The simplistic criticism made is based on a deconstruction notion as a simple synonym of destruction and agnosticism. According to McIntyre (2018), who has been an authority on the subject, it is thought that this idea of deconstruction was taken by sociologists and other specialists to the detriment of the value of truth:

In fact, the notion of truth was now under debate... this meant that there could be many answers, rather than just one, for any deconstruction. The postmodern approach is one in which everything is questioned and little is taken accurately. There is no correct answer, only narrative (p. 125).

Besides deconstruction, there is the notion of narrative, which is understood as a coherent and decoded totality. The danger with the idea of narrative is that the Anglo-Saxon academy immediately associated it with the notion of ideology and all the negative and anti-scientific base it has.

According to Aylesworth (2015) and McIntyre (2018), Michel Foucault is another thinker who has much to do with this operation of transforming science into ideology. This thinker was the one who pointed out that social life is defined by language, but language itself is linked by the relations of power and dominance. This should mean that all statements, regarding knowledge and self-knowledge, are nothing but the expression of a certain power, "they are intimidation tactics used by the elite to force the weakest to accept their ideology" (McIntyre, 2018, p. 126). Since there is no truth, anyone who claims to be educating us or transmitting knowl-

edge is only “trying to oppress us” (p. 126). Likewise, Aylesworth (2015) defines in the Stanford Encyclopedia of Philosophy that:

(...) Foucault’s writings are a hybrid of philosophy and historical research, just as Lyotard, he combines the language of the expert and the philosopher in *The Postmodern Condition*. This mixture of philosophy with concepts and methods of other disciplines is characteristic of postmodernism in its broadest sense (p. 7).

Thus, to summarize, the notion of postmodernism would first imply a glorification of subjective and individual truths to the detriment of objective truth. Second, the absence of science, knowledge and any other type of metanarratives in opposition to diverse local theories, expressions and perspectives. Third, ideology, hailed by the absence of rational thinking, becomes the content of the whole and would always be lurking on the basis of implicit power relations.

However, there are elements that are neither congruent nor logical in this interpretation of facts. The first problem is to believe that post-truth is something entirely new and that occurred after the emergence of postmodernism. There are reasons to assume that post-truth and almost all the processes associated with it have existed since before, except for the rapid increase of new technologies. At the very least, the absolute certainty that it is a completely new phenomenon that is directly related to theories and thinkers as disparate as postmodernism should be questioned.

On the other hand, while post-truth points to relevant and important phenomena, aggravated by the most recent political events, there is no evidence that the value of truth is ineffective. As stated above, since post-truth there is even an implicit trust in facts, truth, or some theories. The problem lies in the type of theories that are referred to, and especially in the absence of rational criticism mechanisms, checks and balances.

At a time when the lack of influence of philosophy is observed, is it possible to think that people in their daily lives read postmodernism, and that this in turn is as influential as Dennet and collaborators think? Moreover, as Chen (2017) suggests, if there is a right to blame postmodernism for the post-truth and the alternative facts, there is the right to blame romantic novelists for unsatisfactory marital relations. Beyond the clear irony, here is a deeper idea that has to do with the relationship between culture and society, theory and practice and their different relations of significance.

Another element to bear in mind is that it is not yet clear what kind of truth is being spoken of when it appeals to the post-truth, a fact that occurs by the conflicting history of the term, even within the analyti-



cal tradition itself, on which there is still little consensus with multiple theories in this regard. If the analysis is consistent with its principles, we should distrust both postmodernism and analytical philosophy and even scientific thought.

As for postmodernism, it is easy to see the reduction made. First, there is a source problem. *The postmodern condition* was a report originally commissioned by the University council of the Quebec government. If the text is analyzed isolated, which was presented without any claim to be a manifest, the significance of that movement is not much understood. The author is essentially limited to the epistemological fate of the natural sciences, a subject on which Lyotard did not know too much:

I invented stories, I referred to a lot of books I had never read, and apparently impressed people; all of that has some parody... it is just my worst book, almost all are bad, but this is the worst (quoted in Anderson, 2016, p. 32).

Regarding the epistemological location of the report, Anderson (2016) has done a thorough work to cast serious doubts about Lyotard's liability: "... the influence that the book exercised was inversely proportional to its intellectual interest; it became the inspiration of a trashy relativism that often passes between friends and enemies, as the hallmark of postmodernity" (p. 33). Not to mention that the book (*the postmodern condition*) focuses on the less important areas of the philosopher's work, forgetting two of his passions: Ethics and politics. The idea is not to completely deny what was expressed by the author, but to shed light on a supposed founding act. Evidently, Lyotard's book must be read from the codes of its own context, both logical and historical.

Referring to Foucault and Derrida, there are reasons to think that serious mistakes are also made by confusing the methods of their philosophical reflections with an alleged destruction of the concept of scientific truth. Foucault would have distinguished between a history of objective truth that falls within the competence of science, and another story more focused on the production of discourses and the subjection of subjects, but in no case did he dismiss the value of scientific truth. Regarding Derrida, there is also no clear evidence that he was more critical than L. Wittgenstein or B. Russell in his investigations.

All these conceptual and theoretical crosslinking cannot end up here, however, these have been explained to justify that the legitimacy of post-truth is unfounded, and deserves further reflection in the near future. Only in this way can we truly understand what it is.

It should be emphasized that the reasons for this operation are not only based on historical and epistemological arguments. There is an ontological argument that underlies the activity of a term as elusive as post-truth: the return to objective facts.

The concern of the post-truth is not just a question about the truth – as old as humanity itself – or not just how new technologies have positioned the way in which data and news are consumed. The question also includes its own starting point, the subject who interrogates. In that sense, the question of the post-truth exclaims a desire not always hidden to return to the stable and solid world of facts, but to the longing of a world with a very specific sense of truth anchored to positive facts. This does not negate certain moral and political effects experienced in the day to day. There have already been signs that there is a real problem, but the claim of post-truth implies a cardinal aporia, as Carrera (2018) says:

Thus, a space of discursive transparency is suggested to seek beyond rhetoric and mediation to reflect reality as it is. This naturalization of certain forms of speech described as true in the face of false forms of speech is profoundly demagogic and recovers old realistic dogmas around the representation topic as a duplicate of the world, without questioning that what is supposedly “duplicated” is the result of a specific historical and power juncture, not an “objective” or natural fact beyond the historical (pp. 1470-1471).

The name of aporia is not at random, since it points exactly to the kind of relationship established between the truth and its theoretical foundation. In fact, the relationship, as has been seen, is not simply between a notion and its foundation, but it also represents another paradigm: realistic metaphysics. This points to an insoluble paradox that lies at the bottom of the post-truth. On the one hand, the dogma of a principle that is unaffordable due to its imprecision, on the other, a truth anchored in the positivity of facts.

Post-truth refers to aporia as a fundamental contradiction in an older philosophical problem. It is once again the cleavage between the subject and the object, between consciousness and reality, the inner and outer world. Hence, the ontological foundation of post-truth in a speech that puts two dogmatic moments in the contender. On the one hand, the idea that all truth is subjective, internal and proper to the subject. On the other, the ancient notion that the true object is beyond perception. And this, though contradictory and dogmatic, is the relationship that has been sought.



Conclusions

By reaching this point, it can be said that post-truth refers to concrete problems in contemporary societies. Immediately, that concept describes an era where new mechanisms of information and data production have caused classic notions of truth to be relative to each other's opinion, emotions, or ideology. Contrary to some thinkers, the idea has also shown that these elements are not enough; post-truth discourse also lacks mechanisms of criticism and collective dialogue.

Journalism, cultural studies, communicational analysis, political science, and other areas of knowledge, associate this definition with a setback in decision-making instruments and an increase in political fundamentalism and populism. This is also related to this lack of critical dialogue that is so necessary today.

In a second moment, it has been shown that, despite making a constant and easy reference to postmodernism, this is still a superficial operation. The biggest flaw in the current post-truth reading is that it is an operation that is too simple and only refers to a vague era with weak justified arguments. The latter, of course, is not the characteristics of the concept, but the very interpretation of it.

This interpretation forgets that critics to postmodernism can be equally directed against realistic metaphysics, since positive fact is an assumption that has always been present in the truth debate throughout the history of philosophy. In fact, this debate, and the questions to the truth, have served to make science and knowledge more and better.

On the other hand, in criticizing postmodernism, it is forgotten that every positive fact is also an interpreted fact. Denying the experiential aspect of truth can be as harmful as denying the importance of truth itself.

For this reason, one of the main conclusions that should guide future analysis of the concept is the presence of a contradiction within it. It is not a question of understanding the post-truth as an identity, but as the sign of a contradiction. In this topic, many people forget how important the interpretative aspect is in the apprehension of truth, and in the understanding of the surrounding world.

This task has already been undertaken by phenomenology since the last century. In the work of the great classics of phenomenology, life experience is not a negligible or minor element of nature, reality, science or truth. The movement that describes phenomenology and its followers does not reject objective truth, nor does it reject the reality of the outside world. For phenomenology, it is essential to understand the idea when talking about a concrete or vital experience.



The relevance of mentioning this movement goes beyond simple biographical or historical connections. It has to do with the suitability that it has to understand more fully the problem of post-truth from the subject's view. Instead of implying a separation between consciousness and reality, phenomenology means just the opposite, an approximation to the given world, to the lived one, to what is immediately presented to man in his daily experience, i.e., experience is given (at least tacitly) as 'my' experience, as one that is being lived. This is the profound meaning of intentionality, a new starting point in knowing that it does not try to discredit objective truth in function of the intimacy of the subject or vice versa; but those truths are simply placed in parentheses — without denying them— to understand what is felt, seen, perceived or lived.

Philosophy must be thought as an inexhaustible relationship against realism that drives the world away from consciousness, or relativism that causes the instability of speech and the sophisms of truth. The importance of understanding truth from phenomenology is essential. From a methodological point of view, it would also be an enormous step forward to understand the subjects' experience of the different ways in which the post-truth is expressed. Thus, the emergence and significance of so-called alternative speeches could be understood. In short, to know and understand the truth, one must not only investigate objectively the expression of a realistic metaphysics, but also include the subject's vital experience. Any other unambiguously-defined path would appear on the most direct path to dogmatism.

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OBJECTIVITY AND TRUTH IN SCIENCE OF EDUCATION AS A DESIGN SCIENCE

Objetividad y verdad en la Ciencia de la Educación como Ciencia de Diseño

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Abstract

Objectivity and truth are key issues in Education which affect the reliability of knowledge and consequently, the recognition of its scientific character and the prestige of the teaching profession. This justifies the thematic debate, to which the Philosophy of Science contributes. The objective is to investigate if objectivity, a condition to achieve the truth in Science, is possible in the Education Science. Its artificial dimension is stressed, as Applied Design Science that (i) seeks to solve specific problems; (ii) uses designs; (iii) is a science of synthesis that combines prediction and prescription; and (iv) is then applied in specific contexts.

The methodology is typical of the philosophical-methodological analysis, which attends to the internal and external perspective and the different levels of Science: semantic, logical, epistemological, methodological, ontological, axiological and ethical. It is applied, firstly, to the analysis of objectivity in Science in general and in Education in particular. Next, truth is considered in its semantic, epistemological, and ontological dimensions. It is then examined how the progressive approach to truth occurs in Applied Design Sciences and specifically in Education Science. It is concluded that the debate about the truth in Education cannot be carried out without considering the ends.

Keywords

Objectivity, Truth, Education, Science, Design, Progress.

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Resumen

La objetividad y la verdad son cuestiones clave en educación que afectan a la fiabilidad del conocimiento y, en consecuencia, al reconocimiento de su carácter científico y al prestigio de la profesión docente. Esto justifica el debate temático, al que se contribuye desde la Filosofía de la ciencia. El objetivo es indagar si la objetividad, condición para alcanzar la verdad en ciencia, es posible en la Ciencia de la Educación. Se incide en su dimensión artificial, en cuanto ciencia aplicada de diseño que: (i) busca resolver problemas concretos; (ii) usa diseños; (iii) es una ciencia de síntesis que combina predicción y prescripción; y (iv) se aplica después en contextos concretos.

La metodología es propia del análisis filosófico-metodológico, que atiende a la perspectiva interna y externa y los distintos planos de la ciencia: semántico, lógico, epistemológico, metodológico, ontológico, axiológico y ético. Se aplica, en primer lugar, al análisis de la objetividad en la ciencia en general y en educación en particular. A continuación, se considera la verdad en sus dimensiones semántica, epistemológica y ontológica. Se examina después cómo se produce el acercamiento progresivo a la verdad en ciencias aplicadas de diseño y concretamente en la Ciencia de la Educación. Se concluye que el debate acerca de la verdad en educación no puede realizarse al margen de la consideración de los fines.

Palabras clave

Objetividad, verdad, educación, ciencia, diseño, progreso.

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Introduction

Truth and objectivity are traits that define scientific knowledge. In education, they have a theoretical and practical relevance. They affect the reliability of the knowledge generated about education and, consequently, the scientific status of the discipline. Secondly, they have a direct impact on the credibility of professionals in their practical activity, since this knowledge guides their patterns of action. Epistemologically, it is possible to reach and determine the object of education—the educational activity, the action of educating—but, as González (1996) pointed out regarding other Social Sciences, the problem is not so much about knowledge but instead the reliability of what is known (p. 55). This refers to ‘objectivity and truth’. Although some truths can be obtained in education, it is not easy to identify new situations in which they are recognized as such. This difficulty arises from the limitations to articulate: educational actions are unique and, although they are similar to other actions, they always incorporate some new ones. Therefore, although it is possible to establish certain regularities, there is no room for a type of regularity expressed in laws, as in physics. This is a problem that concerns the Social Sciences in general.

The educational reality is complex and always changing. In the face of ontological complexity, epistemological objectivity is particularly difficult. It is even more so as the search for universal explanations can distort what is real by skewing the identification and description of the

problem under investigation. For this reason, it is necessary to define what is the object of the Science of Education and those aspects of educational phenomena that belong to other disciplinary domains¹.

Science of Education is understood as an empirical science, more or less consolidated, based on experimental pedagogy as a result of the ‘scientific’ of professional practice, as referred by Niiniluoto (1993). It is conceived as an autonomous discipline, whose object of specific study is the action of education, in the field of reality ‘education’.

As pointed out (Alonso, 2020a), its diversification is assumed in different disciplines, which are identified with it a) from the epistemological point of view, by using the knowledge of science from which they come; and b) ontological, by the field of knowledge that is their own: Didactics, School Organization, Theory of Education, etc. Other social sciences that deal with educational phenomena are not considered as education sciences when they do not study them as a specific object (the case of the Psychology of Education, the Sociology of Education, etc.) and their generating disciplines are different from the Science of Education, Like Psychology, Sociology, etc².

On the ontological level, Education appears as a social activity, with intentional perspective that deliberately seeks to achieve certain purposes—to provide the student something he needs (*educare*) or to extract and guide something that he already possesses (*educere*)—related to human improvement (cognitive, volitive, affective, social, cultural, etc.). To accomplish this purpose, there is the educational act — the object of the Science of Education — which constitutes an integrative element of theory and practice. It is an artificial reality that adds something to socialization. It has a structural and dynamic complexity, which is subject to historicity as well as the context in which it is performed.

While recognizing its dimension as Social Science, this artificial characteristic also allows it to be placed in a different thematic field: The one that groups areas of knowledge that deal with phenomena that are “adapted to human purposes” (Simon, 1996, p. 3). It is necessary, therefore, to admit its dual character and to deepen its dimension of Science of the Artificial, for being human made. Through the mastery of the artificial, the Science of Education is shown as Applied Science which uses designs to solve specific problems.

This proposal opens up many possibilities to address the main problems of the Science of Education from a new theoretical framework: Science of Design as the Science of the Artificial. Among them, the objectivity of knowledge as a condition for a progressive approach to truth

(‘likelihood’), which determines progress in this discipline. Guiding its solution can help consolidate scientific status. These issues concern the Philosophy and Methodology of Science, which has usually not included the attention to the problems of the Science of Education. The analysis available is the input of this article. Its objective is to enable a framework to articulate the cognitive ideals of objectivity and truth — which are a legitimate aspiration of educational research — as a guarantee of rigorous foundation of prescriptions for the improvement of practice.

The methodology used is specific to the philosophical-methodological analysis, according to Wenceslao J. González’s approach to pragmatic realism (1990a, 2012 and 2020). The attention is focused in successive moments, on: a) That which is typical of science in general, taking into account its internal and external perspective. Reflection takes care of different areas (semantic, logical, epistemological, methodological, ontological, axiological and ethical), that correspond to the constituent elements of science³; (b) that which characterizes a group of sciences (of the environment, social or artificial); and (c) that which is characteristic of each science. According to this procedure, the philosophical-methodological analysis of objectivity and truth in the Science of Education is carried out in a sequence of steps, which determine the structure of the article:

The first is to examine objectivity in Education by considering its nature of science, based on how it is observed in each of the elements that make it up. The second seeks to place its thematic field among those in which scientific activity is diversified, since the characterization of objectivity in a discipline is related to its own scope (of the environment, social or artificial). The third considers its character of applied science with a bidirectional relationship with the application of this science. The possibility of objectivity in the use of scientific content by agents, especially teachers, is investigated in different contexts (i.e., objectivity in the application of science)⁴. Since objectivity is a requirement for truth, from the conclusions obtained, the possibility of truth is finally analyzed — taking into account its semantic, epistemological and ontological dimension — in the science of Education as Applied Science of Design.

Objectivity as a precondition for truth

Philosophy of Science focuses on objectivity over truth, because it conceives it as a precondition — *conditio sine qua non* — to achieve or, at



least, to approach the true on its various areas. This occurs in both Basic and Applied Science and also in the application of science in its different contexts. Although it is a complex notion, according to González (2015), it can be defined on the basis of its main attributes: (i) it implies ‘accessibility to any person’ (objective is something that could potentially be understood by any scientist); and (ii) it implies the ‘independent existence’ of a singular mind (objective is that which cannot be reduced to the possession of the mind of a single scientist). Thus, these traits delimit the conditions of objectivity in scientific research: the object of the research must be real and it is the object that determines the results, which must be inter-subjectively recognizable and verifiable. Such conditions are defined in: a) the process, where the principle of publicity guarantees objectivity; b) the contents, which are obtained from the object under investigation and constitute the basis for an impartial judgment on natural phenomena, social events or human constructs; and c) the results of the investigation, which require rigorous testing to be accepted.

From a realistic perspective such as Niiniluoto (1984), objectivity in research refers to the possibility of a progressive approach to truth. At least in semantic terms, when there is a real referent with a property that really belongs to that entity, the truth is accepted and scientific language is fixed. It also seems legitimate to aspire to true knowledge (epistemological dimension): being reality the one that judges, there are explanations that are better than others and everyone understands that the best is the one that seems closest to the truth. This leads to the idea of ‘likelihood’ (Niiniluoto, 1987a and 1987b). According to González (1993), the determination is based on favorable empirical support and the critical elimination of error. Accepting the possibility of error and the fallibility of knowledge means admitting ‘objective truth’, if not as an accessible goal at least as a ‘regulatory idea’, as mentioned by Popper (1979).

In addition, truth can be understood as a trait of the real. Associating the truth with reality confers it an ontological perspective, which is added to its semantic and epistemological dimensions.

Characterizations of objectivity

Science is a highly complex rational activity, which aspires to rigorous knowledge; it is expressed in precise language, is articulated in a well-formed structure (generally in theories), subjected to filters that guarantee its rigor, proceeds according to a method, and it responds to a certain approach to reality. Moreover, as a human activity, Science is oriented to



goals and involves values. All these elements (language, structure, knowledge, method, activity, ends and values) define science in general, according to González (1990a). Therefore, these elements must be present in the Science of Education.

Greater reliability is attributed to it than to ordinary knowledge and to knowledge provided by other forms of access to reality by its self-correcting capacity, which preserves its objectivity. The characteristics that define it—potential accessibility and independence of a singular mind—must be present in each of the components of science, so different analysis can reveal different views of objectivity.

(i) As regards the **semantic** level, González (1986) considers that objectivity finds in reference its essential element, since it allows to associate a defined domain of objects to the expressions. Words are given an objective sense by their reference relationship with a reality that can be objective. Thus, if admitted that there is an educational reality, which has certain characteristics that really correspond to it, then the terms of the statements capable of describing them will be equally objective. In this regard, the expressions that make up the statements used in Education must reflect a clearly identifiable reality.

Initially, the ambiguity of educational language suggests that this is not always the case. But this confusion can be tempered if considering that the complexity of educational phenomena requires interdisciplinary intervention. The references to the discourse of the different disciplines (Psychology of Education, Sociology of Education, etc.) are not the same, but only certain attributes of the same reality, in each case: those that correspond to the specific objects of the science from which they originate (Psychology, Sociology, etc.). Therefore, the terms of the statements that give account to it are specific to each science and are part of its specific language and not that of the Science of Education. Thus, even though the expressions are verbally identical, they do not have the same meaning.

Therefore, objectivity is possible in Education whenever its object of study is clearly outlined, specifying those aspects of 'Education' that constitute the references of the discourse of that science: the action of education and the educational act. Recognizing the importance of the use of language, the meaning of the terms of educational discourse must contribute to the explanation of the reality investigated and, it will also be open to future realities emerging from educational dynamics. This is particularly relevant in the face of changes due to the massive incorporation of the technology. As observed in communicative phenomena (Arroyo 2020), as an educational innovation is more sophisticated (such as those



related to the use of the Internet), the terms should be more precise and their content more delimited.

(ii) The **logical** level addresses the structure of educational theories. It refers again to interdisciplinarity, since the contributions of the different non-pedagogical sciences (Sociology of Education, Economics of Education, etc.) maintain an internal relation with their generating disciplines (Sociology, Economics, etc.). Therefore, it is not possible to confuse the internal articulation of theories that are typical of the Science of Education with those that contribute to Education and respond to the variability of the object studied from other disciplinary fields. In the case of the Science of Education, it can also be expected the articulation that makes it possible to solve specific problems in the Sciences of Design, which, as González points out (2007), is established between prediction and prescription.

(iii) On the **epistemological** area, objectivity implies impartiality and access to any mind, according to Rescher (1997). Popper (1979) also noted that objective knowledge “is totally independent of a subject’s claims of knowledge; it is also independent on his belief or willingness to settle or act. Knowledge, from the objective point of view, is knowledge without someone knowing it: it is knowledge without a cognitive subject” (p. 109). In Education, as in other disciplines, researchers and professionals must be able to approach a reality that exists independently of their mind: the objectivity of knowledge can be increased by eliminating linguistically formulated assumptions through critical discussion.

Although theories are true or false and not mere instruments, for Applied Science and for practice, they are also ‘instruments’. Thus, in professional practice, objective knowledge should be used for formulating personal ambitions. This is possible to the extent that, although the relationship with the educational act is mediated by the language and knowledge already possessed, when false conclusions are obtained, they can be rectified, getting closer to the truth ‘plausibility’. Therefore, educational action as a professional practice and the scientific discipline that considers it as the object of study can achieve a content of knowledge that can be objective.

(iv) **Methodologically**, the Science of Education requires a novel process to increase the objectivity level in problem solving; a methodological orientation capable of bridging the gap between theory and practice. It must allow the setting of a goal that can be achieved and targeted, the selection of guidelines for achieving the objective and the achievement of a result. If successful, it can serve as a model for subsequent interventions;



otherwise, it must be modified. This ‘progressive refinement’ is one of the characteristics of the design, where the results are only justified if they meet the epistemological criteria that guarantee their objectivity, validity and reliability. Thus, the above criteria, at the same time, preside over the rules that guide professional practice.

Difficulties may arise at any point in the process (in the selection of goals, in the reliability of predictions, in prescribing strategies to achieve them or in implementing them), due to the interaction of external factors (social, economic, administrative, etc.) in genuinely educational processes. They must be taken into account so that they do not compromise the objectivity of the knowledge acquired for the resolution of specific problems (either in face-to-face education or e-learning).

(v) **Ontological** objectivity means recognizing the existence of some reality independent of the mind that knows it. It is this reality that determines the statements as true or false, regardless of the knowledge possessed. In Education, ontological objectivity is achieved when the properties of the educational action that really correspond to it are captured, without attributing to it others that belong to objects other than the educational field (psychological, sociological, economic, etc.) or biases that come from own expectations or from external factors (social, cultural, economic, political, etc.).

Educational objectivity is related to properties that belong to the educational activity, regardless of who knows it, which is ‘discovered’ and not constructed⁵, although, in order to be able to capture those properties of the real being – changing and subject to historicity–, appropriate categories need to be developed. As mentioned by González (2015), subjective factors intervene—such as reasons, tastes, desires, etc.—but the scientific results are based on what is obtained from the object under investigation. Ontological objectivity, along with epistemological objectivity, is necessary for the recognition of Education as Genuine Science. Ontological objectivity is possible in Education and therefore there may be a Science of Education.

(vi) The activity — initially professional and, later, scientific — is intended for **purposes**. To achieve these, the appropriate means must be used. Values are involved in the selection of purposes and means. A distinction must be made between: (a) the purposes of educational activity, which refers to a fundamentally anthropological and social issue, which is widely debated; and (b) educational research, which is oriented toward a scientific inquiry into an observable phenomenon and, in principle, also experimental. In the first case, they involve human and social values,



which are the priorities when making an educational choice. According to Nicholas Rescher's conception (1999), objectivity requires that professionals and researchers limit the scope in which they satisfy their preferences, looking at what is the best within certain circumstances, rather than what they would like more or want⁶. In the second case, values have a different character. These include cognitive values such as truth, likelihood, and the link to the validity of knowledge.

(vii) Among the **values** that can influence the selection of ends and means, special attention should be made on ethical values, which are involved in the practical dimension of educational knowledge. In general, human objectives are implicit in the cognitive process, which cannot be subtracted from the pressure of needs and *desiderata* (social welfare, social integration, stability, employability, success, excellence...) modulated according to values. Although needs include fulfilling desires, for Rescher (1999), the real determinant for people's interests is need and not desires: "a person's *true* interests are not those he *has* but those he *should have*, if he properly (sensibly, appropriately) carried out his investigative task and his evaluator task" (p. 91).

The different aspects of objectivity in science, revealed in the previous analysis, lead to the following conclusions: 1) Accepting objectivity implies accepting the possibility of impartiality in the researcher and the professional (which may or may not be the same) and that the contents of Education be accessible to any person. 2) The reality in which Education is concretely — the educational act—exists regardless of the teacher who practices it. Achieving the goal of objectivity requires the objective knowledge generated by the Science of Education. In the meantime, the task of teachers has a high degree of difficulty: (i) they must ensure the objectivity of the language used; (ii) they must justify the possibility of finding the truth through inquiry into the reality of the educational action; (iii) they must legitimize true access to reality; and (iv) they need to consider what their values are and what ethical assessments affect in distinguishing between actions that are appropriate and actions that are not.

The problem of objectivity in education

To address the problem of objectivity (as a condition for truth) in education, an unusual perspective is adopted in this article, which consists in highlighting its artificial aspect as Applied Science of Design. This requires some clarification about the new theoretical framework.

The differences in the objects of study, the problems raised and the methods used justify the distinction between the different types of science. By influencing the former, the difference is established between formal and empirical sciences and, among these, natural sciences, social and human sciences and the artificial sciences. In deepening on the second, scientific activity is diversified into: a) Basic science — which seeks to expand knowledge of what is real through explanation and prediction to increase its degree of likelihood —; b) Applied science, which directs its activity to the resolution of specific problems and anticipates the possible future to establish guidelines for solutions; and (c) Application of Science in different contexts of use.

Historically, the Science of Education was shaped as Social Science, based on experimental pedagogy. There are reasons of epistemological and ontological character that justify it: it responds to a social need, its object of study is produced in a social environment and refers to intentional, purpose-oriented human actions. But as a human activity, Education is shaped as science from the ‘scientific view’ of certain skills of the profession, initially based on experience⁷. It is modulated through practice, from which it is fed back. There is application of science when the solutions proposed by Applied Science are oriented to objectives—solving problems—and aspire to results.

This relation between Applied Science and the Application of Science highlights the role of educational designs. Therefore, the characterization of the Science of Education as Social Science is insufficient, since it does not allow to account for what the educational phenomenon currently implies—moreover, mediated by technology—and does not allow to understand its future projection. It is necessary to recognize its dual character: it is Social Science by the reasons already mentioned, and Science of the Artificial, as stated by Simon (1996), for being human made, both in the goals it poses, it uses and the results it obtains⁸.

Once the Science of Education has been placed in its dual thematic field—social and artificial—as Applied Science of Design, the philosophical-methodological analysis of objectivity in the Science of Education is carried out from this new perspective. Given difficulties as Social Science, it can provide a different criterion for determining the objectivity — and reliability — of knowledge about Education, which results in recognition of its scientific character.

As Applied Design Science, Education Science: (i) is oriented to solve specific problems at the practical level and (ii) it does so through designs, thus expanding the possibilities of Education (clearly by incor-



porating technology). These designs need reliable knowledge of the future to predict the evolution of educational situations and to make prescriptions for solving problems.

Predicting and prescribing require objectivity: Education Science helps solve problems if it has objective for anticipating the possible future⁹, and can establish solid guidelines for the action only if it has objective patterns. The process for achieving the goal is initially outlined and is gradually articulated, selecting guidelines as the feasibility of the goal. To do this, the appropriate solutions among those used by professionals have been studied (as is appropriate in a discipline that results from the 'scientific' of the rules that guide the practice). This leads to a scenario close to the 'natural selection' proposed by Popper (1979) for theories: those who have proved their suitability survive in a 'struggle' that eliminates the inadequate ones. Because it is Applied Science, the evaluation is carried out based not only on epistemic, but also on practical uses, as mentioned by Niiniluoto (1993).

Therefore, when analyzing objectivity in the field of Education, in its thematic dimension, it must be observed, first and foremost, its presence in professional practice. This affects the objectivity of the Science of Education as Applied Science of Design and the application of that science by agents in different contexts.

When examining objectivity in the professional practice of education, an ethical aspect and an epistemic component must be considered. The first implies the conduction of this practice, because objectivity is possible if it is understood, as referred by MacIntire (2007) as fulfilling the purposes inherent in it (p. 233). With regard to the objectivity of the knowledge involved, if teaching practice is taken as a reference, it is appropriate to consider different types of knowledge that are part of this activity, mentioned by Tardif (2004) as: professionals (those who come from the Science of Education and related disciplines), disciplinary, curricular and experiential.

The objectivity of professional knowledge has been analyzed in the past. Regarding disciplinary and curricular knowledge, it is decided according to the criteria of each discipline. Experiential knowledge (derived from and validated by practice) is configured as rules of action, which are transmitted and used in conjunction with those provided by expert knowledge. Their objectivity can be determined from the uniformity in the observation of success, by different knowledgeable agents, without any involved trait that comes from the subject or from the characteristics of the context.

When design guides action—outlining objectives, processes, and results, rather than practical rules resulting from accumulated experience—educational research is considered scientific research from a design perspective. Objectivity traits should be sought by the kind of knowledge produced by the applied sciences which, as Niiniluoto explains (1993), is useful knowledge that functions as a tool for the specific objective of increasing the effectiveness of some human activity. Thus, objectivity in the evaluation of results (in epistemic and practical terms) will indicate the measure of the objectivity of knowledge. Although this assessment is always carried out by various subjects, the effectiveness of knowledge in solving problems is independent. Therefore, objectivity should not be confused with agreement: the criterion remains being the ‘independence of the subject’.

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The difficulty in articulating the singular and the universal—referred to at the beginning of this article—that somehow compromised the pretense of objectivity in educational knowledge could at least be nuanced from this new perspective. While every educational intervention is unique and localized in a spatial-temporal context, the universal character of knowledge that guides the prescription of intervention rules to achieve educational objectives can be accepted. It must fulfill the condition of being ‘independent of the subject’ and therefore valid for any cognitive subject.

The Science of Education provides objective knowledge to solve specific problems. This is applied knowledge linked to the designs, which allows to characterize the appropriate intervention to improve educational practice and prescribe it. It is then up to professionals to apply science. In order to carry out specific interventions in a given context, they must decide which means are appropriate for the intended purposes. In order to ensure practical success, the application of science must be made in objectivity conditions. As Touriñán and Rodríguez (1993) claim, this implies that intuition or experience cannot be used, but the specialized knowledge that is produced as a result of educational research that has an objective scientific basis.

The semantic, epistemological, and ontological dimensions of truth in science

From the perspective of philosophical realism, science is admitted to progress toward achieving increasingly true theories about the world. The

mission of the researcher—also in Education—is to achieve knowledge that is more and more in line with reality, i.e., closer to the truth. This means knowing when something is true and how it is achieved. González (1990b) observes that the Philosophy of Science of the 20th century has followed two main paths to understand the epistemological concept of ‘truth’ and the process to achieve it: 1) the positive path: truth can be accessed and true knowledge can be accumulated and 2) the negative path: false can be rejected by eliminating critical error and this leads to truth as the ultimate goal. Assuming that knowledge is fallible implies the review of knowledge.

The ‘positive path’, in its attempt to accumulate truths with a total absence of criticism, can lead to a dogmatic attitude, such as that maintained by neopositivism. Moreover, the solution it offers is clearly reductionist: by not distinguishing between meaning and truth, truth is reduced to verification, which is sought through empirical evidence. On the other hand, the ‘negative road’, in the constant search for error to eliminate it within a progressive approximation to the truth, can emphasize the critical attitude inherent in Popper’s position (1983), where experience acquires a negative character it refutes claims, but never confirms them¹⁰.

There is a third route, explored by Rescher (1978) and Ilkay Niiniluoto (1980 and 1984) and followed by González (1993), which is the one taken as reference in this article¹¹. By influencing the self-correcting nature of scientific activity, they consider possible that science will reach an objective knowledge of the real world, independent of the mind, through successive corrections. Thus, truth can be reached by accepting cognitive fallibilism.

Niiniluoto has responded (1980, 1984, 1987a and 1987b) to various objections from authors who, from different positions, tried to explain scientific progress without resorting to the truth concept¹². It offers a rigorous analysis of the concept of truthlikeness as a progressive approximation of the truth, thus restoring it to its central place among the objectives of science.

According to his approach, the fact that something is true does not depend on the researcher, but on the reality that exists before being known and, therefore, is independent of the cognitive subject (of his conceptual schemes and representation). This means rejecting the idea of ‘building’ reality, which does not mean that the researcher is passive in knowing; the identification of a specific reality (the object investigated) is motivated by cognitive interest and is only possible in a categorical



structure defined by particular languages. The world can only be accessed through some conceptual framework, and there may not be a single true description because the world (the reality that is out there) does not have its own categorical structure.

Nevertheless, for Niiniluoto (1987a), the fact that the truth is relative to language does not mean that it is relative to each other's beliefs. The world also exists independently of all concepts and has the capacity to determine what the true facts are and what they are not within each of them. Although each conceptual system chooses, in a way, its own facts from its conceptualization of 'the world', that does not mean that it is completely plastic. The world possesses 'facts' in the sense that it is capable of resisting our will.

Hence, from a realistic point of view, it can be argued in favor of accepting the truth in semantic terms: Scientific language has a real reference from which some property is preached, which has been captured. Truth can also be accepted in its epistemological dimension, as it is possible to preach truth (or at least a greater approximation to truth) from those explanations that have empirical support or are maintained after the critical elimination of error and, therefore, are closer to an authentic reality that must be discovered. The existence of this reality makes it possible to approach truth in its ontological dimension. Thus, Science is presented as an attempt to explain reality and truth as its effective goal, to which it is progressively approaching.

The approach of truth in the Science of Education as Applied Science of Design

The Science of Education is oriented, like all science, toward the objective of knowing some truths. As Niiniluoto (1987) says, they are more likely to be achieved if the search is carried out using the best research methods. The best method would be, for González (1996), the one that is coherent with the object investigated. But when considering the development of research carried out in Education, there are different opinions about what its specific object of study is and a diversity of objectives and aims in the research. Hence, the main problem, when analyzing the possibility of truth in the Science of Education is delimiting the reality investigated, which has been identified with the educating process.

Under this object of study, the Science of Education has been placed in the disciplinary field of the Artificial Sciences, as Applied Science of Design. This work refers to the truth of the knowledge that sci-



entific design shows¹³: In design studies, hypotheses are constructed to solve some practical problems (and it is sought to be especially sensitive to minimal changes in a certain number of observable variables). Throughout the process, due to the progressive refinement of the design, the hypotheses can be modified. The results obtained from the knowledge generated usually lead to the construction of a model, but in any case, they have practical application and must be useful to other teaching professionals. In a discipline that is science-based, the path to truth cannot be dissociated from aspiration to objectivity in decisions and actions in practice.

But if Science does not provide some truth, the professional cannot attribute any superiority to it with respect to other forms of knowledge, such as the one obtained from experience. Reflection on the possibility of truth requires consideration of: 1) language, as the basis of a semantic truth that concerns truthfulness in educational discourse, 2) knowledge, so there must be an epistemological truth that implies concordance between the enunciations transmitted and the phenomena to which they refer. It must also examine its pragmatic dimension as an effectiveness in solving practical problems in education and 3) the reality itself: an ontological truth that implies authenticity in the various actors: individual and institutional.

On the semantic aspect, truth is always true in a language. It concerns questions of meaning, among which the reference is essential. In analyzing the relationships between educational language and reality (current or possible), in order to determine its truth, it is interesting: a) the type of relationship established between terms and statements with respect to the objects and processes to which they relate; b) what the reality (the referent) provides, i.e., what specific attributes of educational action are captured by the specific scientific language of discipline; and c) how to transmit that reference through language, so that it is set in the specific terminology of Education Science used by the scientific community. González (2021) considers that philosophical-methodological debates on the language of science have generally focused on Basic Science and have, as on many other issues, paid less attention to Applied Science. They have dealt with two types of statements: (A) those who provide reasons for why something happens and (b) those who anticipate a possible future, whose correction is sought to contrast. In both cases two relevant aspects are considered: (i) a relationship between meaning and truth where an idea of correspondence is assumed for the statement



considered true and (ii) the actual or potential existence of the referent designed by the scientific statement (explanatory or predictive).

Although predictive statements are also made as a guide to action, the prescriptive statements are essential to Applied Science, as these sciences are oriented to problem solving. These kinds of statements, which are the basis for performance guidelines, are especially relevant in the Design Sciences. The context is also important for their formulation. Thus, in these sciences, the concept of truth relates to the right path to achieving a desired goal. This is a notion of truth closer to that proposed by pragmatism, which is decided in relation to the effective outcome, which is the one who guarantees whether the path followed has been the right one in certain circumstances.

The concept of truth is linked to practice, in relation to the context of use and the environment (social, economic, etc.) in which it is acted. In professional practice, language is the mediating factor and also the teacher's main intellectual tool. The pragmatic path of scientific language¹⁴ — the language used is conceived as part of a practice and takes place in a context — emphasizes 'meaning as use'. Thus, as González (2021) argues, being able to master the meaning does not, in principle, require being able to know when a statement is true, but to properly use the statements in a given context so that they can facilitate the effective resolution of the problem. Attention to the pragmatic properties of educational discourse can contribute to its truthfulness in the face of mere persuasion promoted by other types of rhetoric.

The problem of truth in educational knowledge also has an epistemological dimension. As applied science, Education Science has a practical (and even pragmatic) task, which is to solve specific problems, but to do so, it must increase knowledge. It does so by providing the 'cognitive basis' for the exact prediction of all events that are predictable. It articulates the 'pragmatic' function of providing the right means to do everything feasible. Thus, two types of truth come into play: (i) truth as a correspondence between the statements described and the educational phenomena; and (ii) pragmatic truth as an effectiveness in solving practical problems in education.

In the first case, it is worth remembering that educational action is a fragment of reality and that it is only accessed through the conceptual framework that provides a certain language. The problem arises as to how the correspondence between the statements and a reality without structure can be established (not conceptualized, not divided into parts). Niiniluoto (1987a) says that although each language establishes its own



facts from the world, “as soon as a L language is given, with predicates that designate some properties, it is the world and not people who decide which L statements are factually true” (p. 141). Thus, for example, once the meanings of the terms ‘multitasking’, ‘interfering’ and ‘learning’ are set, the phrase ‘multitasking can interfere with learning’ will be true or false regardless of the perception people have on it. In short, what makes it possible to decide on truth or falsehood is the view that the world has of a certain language.

Another important aspect is the procedure by which those properties of reality are captured. The design provides a guide for systematic and rigorous problem-solving planning in educational action (e.g., designing a learning environment to promote attention to a wider range of multisensory information through multi-tasking). A design is a model, a conceptual ‘construct’, whose behavior is compared with the behavior of variables in the real situation. The knowledge obtained—and to be used to prescribe guidelines for educational interventions—must be contrasted to judge its validity and truth. The criterion is, in this case, the pragmatic truth which, as explained by Faerna (1991), is on a relationship (contingent, but well founded) between true knowledge and effective action. Thus, this knowledge is considered true to the extent that it provides a reliable guide for practical action, i.e., that the prescribed intervention is successful.

A well-conceived construct is one that enables the problems that are currently (or are expected to arise in the future) to be effectively resolved, so the solutions it offers must be potentially universal. The truth in its pragmatic dimension relates to the satisfaction of practical purposes. But, although the truth is measured by success, it does not derive from success, but from the very properties of the construct to realize the reality. Hence, ultimately, it presupposes a criterion of truth as correspondence.

This refers to the truth in its ontological dimension, which implies the authenticity of the real, from a reality that is not ‘built’ but must be discovered and has the capacity to determine the facts that are true and those that are not by the theories created by science to approach it. But the action of educating is an artificial reality, a direct expression of human creativity that belongs to the field of what is deliberately sought. How is the authenticity of an artificial reality (which is also subject to historicity) determined? This reflection goes beyond the limits of this article, but since it determines everything that has been argued so far, some considerations are presented:



First, it refers to the reference of a semantic content, which has features that — even if it is a reality—do not depend on the individual mind of the researcher or a group of researchers, but are used by the scientific community in general, the institutions that support that research, and even the society it affects.

Secondly, Artificial Sciences, as has been pointed out, deal with ‘constructs’ that are human-made designs. Simon (1996) places his object of study in the space between the internal environment that makes up those designs and the external environment in which they act. Specifically in the cross-link between what affects constructs ‘from within’ (when making designs), and natural or social laws that correspond to the environment in which these designs are to be applied (with their administrative, regulatory, technological, economic, social limitations, etc.). Thus, the fulfillment of the purpose for which they are built—the adaptation to an objective—implies a relationship between three terms: the end or objective, the character of the artifact, and the means in which the artifact acts. What distinguishes sciences from the artificial is the consideration of the end that guides the performance. So, authenticity in artificial reality is measured by the fulfillment of the ends.

This still requires two observations: (i) the debate about truth in the Science of Education refers to the issue of the ends, like any debate in this discipline; and (ii) it requires authenticity in the actions of the various actors involved on it (individuals and institutions)¹⁵ which should be oriented toward the fulfillment of these purposes.

Conclusions

The progress of Education Science in its approach to truth can be justified when considered as applied science: a) to the extent that it advances in accuracy and precision in the prediction and b) it offers action patterns that expand the success of agents in their professional life. As Science of Design, its progress is measured by the ability to obtain new designs that allow to achieve more ambitious objectives to better select the processes and to obtain satisfactory results in the resolution of concrete problems¹⁶. But this must be done on an objective basis in internal processes (Education considered in itself) and maintaining objectivity in the knowledge of the external constraints of the environment, which make new developments possible or difficult.



The finding of the relationship between the progress in Education Science and its consolidation as Applied Design Science suggests deepening on the artificial aspect of the discipline (which does not imply neglecting its social dimension). It is the responsibility of educational research, which cannot ignore the intellectual orientation offered by practice, but also of the Philosophy of Science, which has not usually considered the specific problems of Education.

Artificial Sciences do not intent to understand and explain phenomena (in this case, educational), but seek to improve things by adding new possibilities. Since the artificial dimension of Education Science has been enhanced by the incorporation of technology, its use has to be explored. This requires thinking about what Education wants from it. Thus, the question of ends (led by the debate about truth) has been revealed as the priority inquiry in Education.

Notes

1. Mainly Social Sciences, but also some Natural Sciences such as Biology of Education or Neurosciences. With the incorporation of ICTs, technology and certain Artificial Science, such as Internet Science, come into play.
2. Although the use of the plural 'Education Sciences' to refer to pedagogical disciplines is justified, the singular 'Education Science' is used to highlight the specific scientific status of this disciplinary field.
3. González's pragmatist realism (2013) adds logical, methodological, axiological and ethical factors to the triple dimension of science that regularly contemplates scientific realism (semantic, epistemological and ontological) (pp. 16-17).
4. For the objectivity analysis in the Science of Education, reference is made to the study carried out for the Science of Communication conducted by Arroyo (2020).
5. As educational action is an artificial reality, this statement must be nuanced. It refers, in this case, to the need to grasp the traits that actually define the education process, because they belong to it.
6. "What counts is not preference but preferability: it is not what people want, but what they should want; not what people really want, but what sensitive or right-thinking people want under the circumstances" (Rescher, 1999, p. 90).
7. Niiniluoto explains (1993) how these skills were concretized into rules of action and were systematized, giving rise to an organized body of knowledge that allows to solve specific problems. When the operation of these rules begins to be validated by scientific evidence, a Science of Design emerges.) This is also the case with medicine or pharmacology.
8. It has previously been mentioned (Alonso, 2020b) that the social and artificial duality is a trait of those sciences rooted in human needs and in which what was built overlaps what was given (Economy, Communication Sciences...). These are disciplines that investigate how to expand human potentialities by means of designs, thus entering a purely artificial field. They influence information and Communication Technologies and Artificial Intelligence to modulate the operability of new objecti-

ves. It clearly happens in Education but has hardly been addressed. There are also a number of disciplines (Communication Sciences, Administration Sciences, Internet Sciences, etc.) that belong to the artificial field, whose development has a direct impact on the current progress of Education.

9. It is the responsibility of Education Science to predict the future of Education. Reliable prediction is needed to prescribe the right actions.
10. The critical attitude leads to rule out scientific statements whose correspondence with the facts is not given. For an analysis of the truth in Popper, González, 2005.
11. González (1993) points out that, although he is more prone to critical attitude, it does not imply the acceptance of the epistemological bases of the popperian falsacionism.
12. Diéguez (1997) states the immeasurability in Kuhn and Feyerabend, the under-completion of the theories in Quine, the effectiveness in the resolution of problems of Laudan, the empirical adequacy in van Fraassen or the redefinition of the concept of truth in Putnam (pp. 302 and 303).
13. This knowledge is oriented to the resolution of problems related to the action of educating. There is no consideration of the possibility of truth—and the criteria for determining it—of knowledge generated about issues related to the possible causes and consequences of such problems, which may be the subject of inquiry of other disciplines.
14. González points out (2021) that the reference theory can have two main directions: Semantics (which prioritizes the conditions of truth) and pragmatics, which emphasizes ‘meaning as use’ (p. 49).
15. The focus has been on teachers, but the decisive impact of the actions of other actors, such as administrators or political decision-makers, is not ignored.
16. This is possible in Education, which must be considered with intellectual standards similar to those that are common in other applied sciences. In addition, prior professional practice is available for this purpose.

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REFLECTIONS ABOUT PROBLEM OF TRUTH, SCIENCE AND TECHNOLOGY AND ITS IMPLICATIONS IN THE EDUCATIONAL FIELD

Reflexiones sobre el problema de la verdad, la ciencia y la tecnología y sus implicaciones en el campo educativo

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Abstract

First, this research will be done a cartography about main streams of philosophy to understand present discussion about truth, knowledge and science considering a world marked by technology and the corresponding implications in education. In this sense, using the genealogical method I analyze the emergence of the technology concept to identify both the historical and conceptual conditions of possibility. This allows us to appreciate how the application and consolidation of modern science caused a break in the conception of technique to move to technology. In this way, the relationship between technology and the human being is analyzed under the confrontation of two opposite perspective, on the one hand, the reflections made by Martin Heidegger and on the other hand, the approaches made by Ortega y Gasset to make visible the dispute of the vision of technology. The results of this debate will allow us to appreciate the implications of the technological revolution in different fields of education, considering its limits and possibilities. Among the main findings is that modern science direct influences on the consolidation of technology as opposed to the traditional technique under positivist criteria that have monopolized the concept and knowledge about truth, set aside other spheres such as art, politics, or love. This has led to a growth of relativistic cultural positions. In addition, these aspects have marked the contemporary world, also affecting the educational field.

Keywords

Truth, science, knowledge, technology, education, genealogy.

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Resumen

La presente investigación tiene como objetivo central realizar una cartografía del estado actual de la filosofía en función de comprender el debate vigente sobre la verdad, el conocimiento y la ciencia en un mundo signado por la tecnología y sus correspondientes implicaciones en la educación. En este sentido, usando el método genealógico, se analiza la emergencia del concepto 'tecnología' en función de identificar las condiciones de posibilidad tanto históricas como conceptuales que permiten apreciar cómo la aplicación y consolidación de la moderna ciencia motivaron una ruptura en lo que hasta entonces se conocerá como técnica para dar lugar a la denominada tecnología en la actualidad. De este modo, la relación de la tecnología y el ser humano es analizada bajo la confrontación de dos ópticas opuestas, por un lado, se tomarán las reflexiones realizadas por Heidegger y, por otro, las planteadas por Ortega y Gasset con el objeto de visibilizar la disputa de la visión de la tecnología. Los frutos de este debate permitirán apreciar las implicaciones de la revolución tecnológica y científica en la educación considerando sus límites y posibilidades. Entre los principales hallazgos se encuentra que la ciencia moderna impactó directamente en la consolidación de la tecnología frente a la tradicional técnica bajo criterios positivistas que han monopolizado el concepto y conocimiento de la verdad, dejando de lado otros ámbitos como el arte, la política o el amor. Esto ha desembocado en un crecimiento de posiciones relativistas culturales. Estos aspectos han marcado el mundo contemporáneo con un impacto radical en el campo educativo.

Palabras clave

Verdad, ciencia, conocimiento, tecnología, educación, genealogía.

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Introduction

One of the most outstanding features of the 21st century is the great changes that have resulted from the so-called *Fourth Industrial Revolution* marked by technology that has radically changed the way of being and perceiving the world. For example, social networks, internet, influencers, computers, blogs, AI, virtual libraries, wikis and streaming services have altered the ways of working, learning, communicating and knowing.

In the face of these great changes, framed within a project of capitalist modernity, numerous questions are opened to debate. According to Medina (1989, p. 13), the need for systematic reflection on the relationship between knowledge, truth, technology and science is due to the great social, cultural and environmental impact, among other things, of the latest scientific and technological developments. New concepts such as the technoscience highlighted by Guzón (2020) show the profound impact of technology.

Education is one of the many fields where technology has impacted; it is only necessary to observe how so-called information and communication technologies (ICT) have increased in the didactic field along with virtual modalities, modifying certain traditional elements of school and access to knowledge.

In this sense, the main objective of the article is to map the current state of philosophy in order to understand the debate on the truth, knowledge and science in a world ruled by technology and its corresponding implications in education, using a genealogical methodology. The research is structured in three parts, the first addresses the problem of truth from contemporary philosophy, which, in turn, is directly linked to the current of thought. Thus, the lines of truth, science and knowledge are linked following the approaches of Alan Badiou and Markus Gabriel. In the second part, a brief historical and conceptual tracing of the term technology is carried out to take the contributions made by Heidegger and Ortega y Gasset, and to contrast both theoretical perspectives on this subject. Two visions are confronted that perceive technology as a potential danger to humanity, on the one hand, and an optimistic vision that sees on it a means to modify nature, making life easier for human beings. Finally, as a result of the application of the previous debate, the current role of technology in the formal educational field is studied in accordance with its limits and possibilities.

Regarding the concept of truth in philosophy

The problem about the concept of truth has been a recurring topic in philosophy that has been working it from various approaches and positions, often totally opposed. As every philosophical problem, it does not and surely will not have a definitive solution. However, its reflection continues and is embodied in one way or another in the current state of philosophy; thus, considering the approaches of Badiou (2010), there are three great marked currents of thought in contemporaneity that are necessary to visualize since they will allow to make a cartography of the possible ways of dealing with the problem of truth.

According to Badiou (2010) the three main philosophical currents are hermeneutics, analytical and postmodern. The first comes historically from German Romanticism and the most representative authors are Heidegger and Gadamer. The second emerges mainly from the influence of the Vienna Circle and the main philosophers that represent it are Carnap and Wittgenstein. As for its historical niche, although it appeared in Austria, it is now hegemonic in the English and American academy. The third takes elements from the two above and works actively in France, although it is also strongly taken in Spain, Italy and Latin America. Jacques Derrida or Lyotard are very influential names in this line of thought. It is impor-

tant to mention that these three lines respond to countless intersections, mixtures and circulation networks between these three points (Badiou, 2010, p. 52), however, from an overview they would be the keys.

The problem of truth is dealt differently in each of them. For the hermeneutical current, the objective of philosophy is to decode the sense of its existence in the world. As Badiou (2010) points out, its central concept is 'interpretation'. His concern is centered on the 'method' that could shed light on the darkness of reflections, as Gadamer (1977) says. From this point of view, interpretation allows to open from the immediate world, which is rather closed, hence his dispute between the world of philosophy and that of technique, where the latter would incarnate nihilism and the closed.

For Badiou (2010), the analytical current is very clear in trying to delimit the alleged borders between the statements that make sense and those that do not, and thus a demarcation between what can be said and what cannot be said, or in Wittgenstein's words (2016, p. 62) we must be silent on what cannot be spoken of. The key tool is the logical and grammatical analysis of sentences, although more accurately, the entire language. The central concept of this current is that of rule, since the mission of philosophy is only to find the rules of language that ensure agreement about meaning so as not to fall into illusion or discordance.

According to Badiou (2010), the postmodern line has as its main goal the deconstruction of those supposedly evident facts of modernity; particularly it focuses on the great theoretical buildings inherited from the 19th century that imprison the thought, such as: subject, progress, revolution, science, among others. Its position emphasizes the impossibility of applying these great constructions since multiplicity is what constitutes contemporary, and it is no longer possible to try great epics of thought by not being able to reduce its plurality; therefore, it is sought to deconstruct the same idea of philosophy as a whole. Among other areas, what is proposed is the mixture between the conceptual method of philosophy and artistic enterprise.

In spite of their great differences, there is something in common in all of them, and it is the topic of an end, of a realization which can be seen in this way: the ideal of truth, as postulated by classical philosophy, has come to an end as mentioned by Badiou (2010, p. 55). This implies that the three currents also hold the end of metaphysics in their classical perspective. For example, Heidegger (2012) shows the closing of the history of philosophy and, therefore, of an entire period dating back to, at least, Plato. Carnap (1988), diametrically opposed to Heidegger, also



affirms the impossibility of all metaphysics for a totally different reason, especially because it would be built from unregulated and meaningless statements. For Lyotard (1987) it is well known that one of his most influential theses is what he calls the end of the 'great stories'. Here it is not necessary to mark the reference toward the end of metaphysics, as it is extremely explicit the intention to show the end of the great narratives that it embodies.

Therefore, truth, as a category, is judged by contemporary thought and the classical figure of philosophy. The center of reflection seems to have changed toward sense and language. In the view of Badiou (2010), there are two axioms common to the three main philosophical currents: the first states that the metaphysics of truth has become impossible and the second states that language is the crucial area of thought, because meaning takes place there. Then, the question of meaning replaces the classic question of truth.

However, as Markus Gabriel (2016) recalls, this picture seems to believe that everything around it responds to some kind of cultural construct and at best, natural sciences describe things themselves, and this undoubtedly brings the so-called spirit sciences to a complicated position (2016, p. 145). The problem is that if accepting that everything responds to a cultural construct, the distinction between the true and the false disappears completely, since ultimately everything is a matter of perception as mentioned by a certain absurd and naive constructivism.

Within this dilemma of truth, in the author's view, the proposals of the German philosopher Markus Gabriel and the French philosopher Alan Badiou (2010) succeed in basing a new vision of truth that shortens many of the previous problems. In the book *Being and Event* it is mentioned that truths are generic multiplicities, because no linguistic predicate allows them to be discerned, no explicit proposition can designate them. [In this same line it is legitimate] (...) to call subject to the local existence of the process that develop these generic multiplicities [defining subject as:] (...) a point of truth (2010, p. 117). This would allow a new metaphysics to be found within a new materialistic dialectics. Descartes (1644) had already intuited the existence of these truths: there are such a large number of truths that it would be very difficult to enumerate them. But, it is not necessary to list them because we could not ignore them when there is an opportunity to think about them (p. 47). Truth is therefore imposed by its own intrinsic force and of course has an ontological nature. At the same time, however, the way truth looks is unique. The

universality of truths is supported by subjective forms that cannot be either individual or collective (Badiou, 2010, p. 118).

For Badiou (2010) truths have seven fundamental characteristics. The first states that even though truth is produced in a measurable time, it is eternal in that, from any temporal point, it is always intelligible. The second expresses that, although inscribed within a particular language, it is translinguistically and, therefore, separable into each particular language. The third presupposes an organically closed set of material, therefore every truth is the trace of an event. The fourth recalls that these strokes are related to an operational figure called the new body. The fifth explains that truth articulates and evaluates what it understands on the basis of its consequences. The sixth property explains that truth establishes a new subjective form from the articulation of the consequences. Seventh, truth is both infinite and generic, i.e., that it is a radical exception as well as an elevation of anonymous existence at the level of the idea.

The relationship between thought and truth is also worked in an innovative and strongly influential way from the so-called new realism represented by Gabriel (2019). Any form of realism, according to the author, is more accurate than the hegemonic constructivism that is being lived, as follows:

The argument I am thinking of can be called the argument of truth. Part of the observation is that we can express what we believe as real through statements. These statements, through which we claim to determine reality, can be called affirmations. Statements can be true or false (p. 76).

Simple affirmations such as ‘people live in Ecuador’ or ‘cats are animals’ express true affirmations which simply mean that the truth of the statements is only a connection between the affirmation and their content. Up to this point there is nothing innovative because Aristotle has already manifested it. And Gabriel (2019) rightly states that nothing is easier than the truth [while remembering] (...) sometimes it is difficult to discover what the truth is (p. 79). And it is here that constructivism confuses the truth with recognition by the institutions created by the human being. Without the existence of the truth, we could not even communicate, since it requires a set of common beliefs, since paradoxically any disagreement on an important issue presupposes that we share a common system of opinion (p. 88). Therefore, for Gabriel (2019):

Therefore, the conclusion of the truth argument is, ultimately, that constructivism consists, more or less, of a series of well-disguised inconsistencies. The constructivist modifies the meaning of each statement.



But this also changes the significance of their own affirmations, so that in the end we can no longer communicate with the constructivist in a common way. Normally, we do not consider our statements to change reality; rather, we assume that they refer to a reality that contains much of what is not an affirmation (p. 89).

Thought plays a fundamental role here, since thanks to it all sensory modalities are objective. The human being thinks, as animals do, however, the radical difference is that it possesses a logo that makes the human being a creature that directs his life around the fact of having it. Therefore, Gabriel says (2019) that human has the capacity to think about thought and this implies the fact that there are different and incompatible theories of thought that cannot be all true at once, they are explicitly mutually exclusive most of the time (p. 98).

Once this succinct cartography is made around the current state of philosophy regarding the problem of truth and knowledge, it is imperative to bring it together with the reflection on the nature of science strongly worked by contemporary epistemology. Next, an approach will be made to questions such as: What is meant by science? What are the criteria for determining a discipline as scientist? What are the implications of a discipline to be considered scientific?



About knowledge and science

In everyday life the question: what is a science? is recurrent, and it is certainly a key issue at present and not only in the epistemological field, as it has numerous implications in multiple dimensions. Before addressing the question of how the current conception of science arises, it is essential to remember with Chalmers (1990) that it implies scientific status in the contemporary world:

Scientific knowledge is proven knowledge. Scientific theories derive, in some rigorous way, from the facts of experience acquired through observation and experimentation. Science is based on what we can see, hear, touch, etc. Personal opinions and preferences and speculative imaginations have no place in science: Science is objective. Scientific knowledge is reliable knowledge because it is objectively proven knowledge (p. 11).

According to Chalmers (1990) the view of science mentioned above is strongly influenced by the scientific revolution that took place fundamentally in the 17th century and which was carried out by pioneers

of science as Galileo and Newton (p. 11). In this sense, it is no coincidence, as Artigas (1999) recalls, that the origin of modern experimental science coincided with that of modern philosophy that begins with Descartes (p. 67). As is well known, Cartesian dualism allowed science to advance almost without precedent. At the same time, however, it created a great deal of confidence in science and its method, which was meant to extrapolate the different ways of knowing. In fact, as López (2013) recalls, there was also an eagerness to find a method for the human sciences to equalize the status of experimental sciences, the one proposed was hermeneutics.

The scientific model that predominated was the one put forward by Isaac Newton in his famous work *Mathematical Principles of Natural Philosophy*, where the importance of mathematics and experience in the new science is emphasized (in Artigas, 1999, p. 66). On these approaches, a positive epistemology is created, as Artigas (1999) recalls, where science was reduced to relating observable phenomena, renouncing knowledge of causes (p. 68). However, this view suffers from numerous shortcomings and is mentioned by Chalmers (1990) as 'naive inductivism', which would basically consist of believing that science comes solely and exclusively from observation. Obviously, this reductionist view of science is wrong and dangerously misleading (Chalmers, 1990, p. 24). In the words of Gómez (2014) this, rather than absolute and objective truths, are values that govern in science and not exclusively, as some argue, social sciences (p. 15).

At this point, it is essential to be clear that science is not isolated, it is always related and seen from non-scientific premises. In this way, according to Gómez (2014), it is interesting to appreciate how the neo-positivist current that argued a strong inclination to empiricism and the reverential dependence on logic [in turn it had a political intention as soon as] (...) was part of a political, emancipating and functional project (p. 18) and had as its central axis the alienation from metaphysics. In this context, it is known that the Vienna Circle drafted a manifesto called *the scientific conception of the world*, where besides mentioning the objectives and proposals for its project, the position on the non-valuative neutrality of scientific knowledge is evident (Gómez, 2014, p. 20). In fact, the project seeks a political objective, namely that of a better world on the basis of unity of science and action.

Thomas Kuhn will be the one who points out that science has a strong valuing burden and therefore an intrinsic social humanity. This author distances himself from positivist approaches through concepts such as paradigm. In fact, *the structure of scientific revolutions* is one of the key works in the field of science and philosophy in the 20th century: His



book caused an authentic revolution, the effects of which still remains in the modern philosophy of science (in Artigas, 1999, p. 85). One of the main contributions made by this author is Gomez's judgment (2014) in the explicit recognition of the presence of values not only in scientific activity, but also in his unit of analysis (p. 69). With this historization of science, Kuhn makes a great change in the face of the prevailing positivist positions of his time.

The paradigm concept is undoubtedly the most transcended element of Kuhn's philosophy of science, defining it is an arduous task since it uses it, at least, in two ways. On the one hand, it can be understood as what members of a certain scientific community have in common, i.e., the set of techniques, models and values to which members of the community relate more or less consciously [and, in a second sense, they refer] (...) to a singular element of this set (2008, p.14), for example, the *Principia* of Newton or the *Almagesto* of Ptolemy, where they both have in common the ability to replace explicit rules and allow the definition of a particular and coherent research tradition.

Knowledge, in the words of Chalmers (1990), does not longer occur by a logic of order and progress, but would be explained by the abandonment of one theoretical structure and its replacement by another, which is incompatible with the previous one or in terms of Kuhn pre-science-normal science-crisis-revolution-new-normal-science-new-crisis (pp. 127-128). Change would be oriented toward and from new paradigms that establish the necessary norms to legitimize work within the governing science. In this sense, the requirement for a discipline to be scientific is a large part of modern sociology that lacks a paradigm and is therefore not described as science (p. 129).

Today, human sciences have evolved to adapt to these new demands, which are certainly more viable than those posed by positivism. However, it is important to say that Kuhn's approaches are far from absolute and for this reason he has received harsh criticism accusing him of being relativistic, because according to Chalmers (1990) the decisions and choices of scientists or groups of scientists shall be governed by the values of these individuals or groups (p. 145). Clearly there is no universal criterion that can be cataloged as purely rational. For Badiou (1999), along with other elements, thought devices, inspired by mathematics, logic, and the heritage of the Vienna circle, hold the figure of scientific rationality as a paradigm (p. 9).

Badiou's (1999) approaches to science are interesting, since for him mathematics constitutes nothing less than ontology, the being. And

taking up the subject of truth, it can appear in four fields such as love, art, science and politics (p. 25). At this point it can be seen that the truth is not confined or monopolized to experimental science, indeed, even to human sciences. Fields like love and art are incorporated, which from a positivist approach are impossible to consider. The author calls these four places 'truth procedures' or generic procedures.

Badiou (1999) says that the excessive concern in which any discipline is considered scientific comes from the social imaginary extended by the success of experimental science and the approaches of positivism. For him, truth is not necessarily tied to science, it is not a unique and exclusive field of science, but it is in other places like art and even love. This opens up new questions about science: Do all disciplines need to be science? Perhaps this, rather than enriching them, impoverishes them?

Once the current state of philosophy has been recalled in the field of reflection on truth, knowledge and science, it is necessary to relate it with today's element: technology. It is certainly impossible to understand the present if the technological component that signals contemporary times and which has radically changed the way we are in the world is omitted from reflection. To do this, first of all, it is necessary to reflect on what is meant by technology.

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Technique or technology?

For Quintanilla (2017), the concept of technology is relatively recent as it should be sought in the Industrial Revolution of the 18th and 19th centuries. It is right in this period when there is a break in the way of understanding what is called technique, and from it a new name will emerge. In fact, as known, it was at this time that the production system of the different material goods was modified due to the progressive appearance of different machinery that would replace the traditional hand-made tools, highlighting, among them, the famous steam machine.

Before these events, according to Ferrater Mora (2009), traces of the word *téchne* can already be found in the Greek, referring to an ability to transform a natural reality into an artificial reality. However, the technique is not any skill, but a very specific one that follows certain rules, in fact, that is why it can also be understood as work since the technique is all series of rules by which something is achieved. In this sense, there is one technique for hunting, one for the government and one for the navigator. For Aristotle, for example, *téchne* is superior to experience, but

less than reasoning. Spengler, on his part, defines the technique as 'the tactic of life'. This definition is put on the basis of the idea of man as a 'prey animal'.

In any case, the emergence of the concept of technology cannot be understood without that of technique, since the latter, following Sarsanedas (2015), has a long philosophical tradition of reflection, which, as has already been mentioned, appeared in ancient Greece under the form of *téchne*, referring to an art, a practical skill or procedure that achieved a given outcome. This conception of Greek technique was modified in Latin to be transformed into art. However, it will not be until the Renaissance when these two concepts are clearly distinguished: on the one hand, art linked to dimensions of beauty and, on the other, technique related to efficiency and utility in a pragmatic framework.

At present, as Sarsanedas (2015) states, despite the different ways of defining the technique, a common line of thought can be found which understands it as manufacturing, production and construction from elements provided by nature to achieve certain objectives (p. 3). In fact, it will be in the 18th century when the concept of technique will go fully into the set of procedures that allow 'useful' things to be done. So, what is the relationship between technique and technology? According to Sarsanedas (2015), the latter would be the task of modern science and [...] it presupposes techniques as essential forms of human action (p. 4). In this way, it can be said that the technique precedes the technology within the historical field, being the latter the phenomena with more contemporary influence due to the increase of modern science, giving as a result information and communication technologies.

Therefore, Sarsanedas (2015) says that technology presupposes technique and is intrinsically related to modern science, in fact some define it as a simple application of science (p. 4). Therefore, he agrees with Quintanilla (2017) in tracing modern technology to two previous events, on the one hand, the Industrial Revolution, and on the other, the development of capitalist modernity. These two contextual elements are drawing a new era of civilization which constitutes a turning point with regard to the conception of pre-industrial technique. Therefore, reflections on technology in many authors are indistinct, as this latest name is very recent and responds to the enormous increase of modern science.

As referred by Sarsanedas (2015), technology can be understood simply as the application of science; it is easy to appreciate how both terms are so related today, becoming one. As Chalmers (1990) recalls, science has become a kind of guarantor of access to truth to the point that

the adjective ‘scientific’ produces a sense of solidity due to the monopoly of knowledge possibilities. However, in the face of this mastery of technology and positive science, Badiou (1999) shows that there are other possible paths to truth such as art, politics and love.

In this context, the relationship between human beings, technology and science has been an issue where basically two opposing positions can be found. On the one hand, there would be thinkers, like Heidegger, who see technique as risky and even dangerous, something that humanity will not be able to control. On the other hand, authors such as Ortega y Gasset consider technique and human beings as intimately linked elements in an almost symbiotic way. It is therefore necessary to explore both classic perspectives on technology presented by these authors and their implications in education.

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Heidegger and technique as a danger to humans

References to technique can be found in the German author Heidegger’s magna *being and time* (2012) and more specifically in his writing *The Question for Technique* (1994). In the first text, the author refers to technique as the daily way in which man relates to technical objects, this is a daily vision in the field of practice. It will be in the second text where the author enters fully into a philosophical critique where technology is its central problem.

It is important to consider that, in Heidegger’s *Question for Technique*, the core of the reflection is on the relationship of the technique with the Self and the human being from an ontological point of view.

Heidegger (1994) understands technique as an instrument that has two dimensions, the first as a means to fulfill certain ends and the second as a man’s making. Both conceptions will be two sides of the same coin as establishing ends, creating and using means is also a man’s making. Thus, an instrumental and anthropological conception of the technique is observed. Heidegger does not ignore the difference between technique and technology; however, he uses the same term to refer to both: the instrumental definition of modern technique, which is normally stated, that, compared with the traditional technique, is something completely different and therefore new (p. 10). For the author, both technique and technology are means to certain ends, however, without using this name he sees the most contemporary technology as something totally new.

According to Heidegger (1994), human beings seek to dominate the world through technique. The problem is that, by wanting to master the technique, it escapes from the domain of man. For authors like Linares (2003) what is hidden behind this intention is the human desire to conquer its power and appropriate it.

In this way, the main problem of the technique can be found as Patricia (2010) points out in its totalizing tendency, its pretension to cover the whole reality (p. 16). In general terms, there would be a domination of the human being who believes to be free. Zizek (2006) raises this issue as follows:

Today, with the perspective of the biogenetic manipulation of human physical and psychic characteristics, the notion of danger inscribed in modern technology, elaborated by Heidegger, became a common currency. Heidegger stresses that the real danger is not the physical self-destruction of humanity, the threat that something will go terribly wrong with biogenetic interventions, but that nothing *will go wrong*, those genetic manipulations work perfectly; at this point, the circle will be somewhat closed and will abolish the specific opening that characterizes the human being. That is, is not the Heideggerian danger (Gefohr) precisely the danger that the ontic will surpass the ontological (with the reduction of man, the here of being to another object of science)? (p. 252).

Humanity, as such, should freely set certain limits in the function of renouncing certain 'progress'. In the case outlined by Zizek (2006) on biogenetics, Heidegger would say that the survival of human beings cannot depend on an ontic decision of humans (p. 252).

Heidegger advanced in time by reviving the risk that technology will become the predominant way of producing our life, not only in a material sense but also in a spiritual and cultural sense (Linares, 2003, p. 35). In this context, technical means are not controllable for humanity nor by nature and human life.

Zizek (2006) mentions that technology is originally conceived as a means for something, however, it seems that it is becoming in that something, the 'thing itself'. For example, computers were initially used by publishing houses as a mere tool for making prints more efficient. Thus, they were means for printing. However, the same virtual text began to be conceived as the 'thing in itself', i.e., printing was no longer necessary. The question that arises is what will happen to the 'thinking computers' that were originally created to facilitate human thought, then, 'will human beings who read be reduced to an esthetic complement, like the book printed in the digital age?' (p. 257).

Therefore, for Linares (2003), it makes sense that the predominance of contemporary technological power in human life is played by the very being which is, in essence, creative (poietic) freedom before being; freedom to be (p. 36). Heidegger's alternative to this is not linked to a return to a supposed pre-technological natural life, but rather to find a genuine way to inhabit the world. On this road, Heidegger returns to the Greco-Roman origin of the *techné* that is more linked to its artistic dimension connected with beauty. For this author, the essence of the technique is nothing technical, but something that transcends it.

Heidegger's position (1994) on technology, and updating his thinking, also in the face of modern science or technoscience, certainly glimpses many of the problems facing modern day. However, it is necessary to analyze another, perhaps opposite, different position from Ortega y Gasset.

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The substance of the technique in Ortega y Gasset

For Diéguez (2014) the reflections on the technique by Heidegger are well known to philosophers from all over the world and have been very influential in contemporary ecological thinking (p. 131). This is very different with the approaches made by Ortega y Gasset that have not received similar recognition or attention even among the scholars of his line of thought. This may in principle be due to different causes, among which the seemingly simple content of their *Meditation on Technique* (1982) stands out and the rescue of other more influential dimensions related to epistemological, political, social, ethical, esthetic issues, among others.

Ortega y Gasset's (1982) position on the technique seems to be totally opposite to Heidegger's, as was seen at the meeting they had at the conferences held in Darmstadt in 1951, where opposing approaches were held. Much of the philosophical historiography has not been particularly kind to Ortega y Gasset's approach to the technique (in Diéguez, 2014), as he has been accused of taking a naive and optimistic position; it is superficial if we compare it with others, especially Heidegger's (p. 134). However, it is important to rescue his vision of the technique open to new possibilities of making human life. Therefore, he separates himself from purely instrumentalist visions in order to give a radical importance to the role of the technique in the very existence of the human being, which also allows to address recent approaches such as those made by transhumanism.

In the first view about the courses of technique taught by Gasset (1982) he begins by saying the role that writers should have: the writer's mission is to anticipate what the problem will be, to provide readers time, i.e., before the debate arises provide clear ideas on the issue (p. 4). It certainly fulfilled this mission, even in areas such as technology.

Ortega y Gasset (1982) is categorical in manifesting that without it, man would not exist and would never have existed. And he goes further by saying that it is the technique that allows us to be human; the technique allows us to meet the needs, because it is the energetic reaction against nature or circumstance (p. 8).

Ortega observes the hostility of nature to the human being, who through technique seeks his well-being in the world around him, how can it be said that nature does not try to destroy humans? To answer the question, it would be enough to spend a single night in wild nature to see how nature is capable of destroying humans. Then, as Diéguez (2014) says, the place where the human being feels truly comfortable is not nature, sometimes idealized, but in a world largely shaped by that thick and extensive overlay that has worked hard to create technology for him (p. 135).

This search for human well-being will be a constituent part of his being and is only possible thanks to technology. In fact, it is curious to observe that for Ortega y Gasset (1982) the needs covered by the techniques are not precisely those that are associated with animals, since the animal instinct is sufficient to cover the basic needs. In humans, on the contrary, only the objectively superfluous is necessary (p. 10).

These affirmations become more complex when questioning what is understood by welfare. In the case of Ortega y Gasset (1982) it is inferred that they are directly linked to a vital project; man, technique and well-being are ultimately synonymous (p. 10). In this sense, human nature is conceived as indefinite and constantly changing.

These reflections he makes can be perfectly related to the contemporary proposal of transhumanism, whose techno-philosophical approaches are based on the explicit search for a substantial transformation of our species, as mentioned by Diéguez (2014, p. 143), which could happen by an integration of the human being with the machine, originating a kind of cyborgs, or, perhaps, modifying human genes in the germline, in both cases leading to a new species other than human, a post-human species. Some years ago, these approaches might have seemed science fiction, but today they are increasingly near and real possibilities.

While it is true that the context in which Ortega y Gasset wrote (1982) made it difficult for him to imagine the transhumanist postulates,



it is also true that his approaches can be used to reflect on the new issues of this position. In this sense, this movement seems to have found a source of defense in Ortega y Gasset's claims (1982) such as:

Man is, therefore, first and foremost, something that has neither a reality nor a body nor a spirit; it is a program as such; therefore, what is not yet, but aspires to be. [o] (...) man, whether he wants or not, has to make himself (pp. 15-17).

Ortega y Gasset's (1982) approaches may share with transhumanism a rejection of the existence of a human nature or condition from an essentialist point of view. It is important to consider that for Ortega y Gasset (1982), human being is a being with a historical dimension, and technology is important to make him human and to improve his lives through technology. A rupture with transhumanist positions can be found here since, as referred by Diéguez (2014), instead of seeking an improvement of human life through technology, an improvement of human beings is sought (p. 144). Therefore, the limits of transhumanism for Ortega y Gasset might imply a dissolution of the human.

There is a big difference between Ortega y Gasset's approaches (1982) and those made by transhumanism. While the former seeks that technology modifies nature so humans adapt better to it, it sometimes almost eliminates the effort imposed by the circumstance achieved by reforming it, by reworking against it and forcing it to adopt new forms that favor man (p. 13), transhumanism seeks precisely the opposite, namely a modification of human beings for their adaptation to different hostile environments that they may face in the future.

In this sense, it has been observed how Heidegger and Ortega y Gasset present two opposing views on technology and science, while the first warns of their risks, the second shows their possibilities without reaching positions presented by transhumanism. Today these two positions have long marked the debate on technology and science, but relatively new approaches have also emerged, which are having a major impact on contemporary thinking. Thus, contemporary philosophers of technology, such as Feenberg (1991) have classified the debate on technology into two major groups, instrumental and substantive.

The debates on technology and science

The limits between technology and science have become extremely diffuse and it is almost impossible to differentiate them, especially when

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modern science is guided by positivist and pragmatic parameters such as practice, application and use. The main difference between science and technology was that the first was guided by the search for truth and the second by the search for utility. However, this affirmation is difficult to maintain when most of the scientific work is aimed at obtaining marketable goods within the framework of a world guided by liberal hegemonic market logic. In this context, reflections on technology are intrinsically linked to modern science.

For Andrew Feenberg (2000) philosophical reflection on technology can be grouped in two broad concepts, on the one hand, in the thinkers of instrumental theory and on the other, in the advocates of substantive theory. The first is characterized by considering technology as dependent on the values established in other areas, such as politics and culture. The second states that the use of technology implies significant consequences for

Feenberg's instrumental theory (2000) would be the hegemonic current of reflection on technology, based on the idea that these are tools for those who use them; in this way, technology is considered a neutral field with no valuable content. The idea of neutrality is problematic because it implies total indifference to the political field, which is really difficult to maintain in the contemporary world. On the contrary, the substantive theory, put forward by authors like Jacques Ellul and Heidegger, would state that technology is not and cannot be neutral, but it is characterized as a key element, namely a cultural system that restructures the entire social world into an object of control. Max Weber, in some areas close to these approaches, already spoke of an iron cage that implied the rationalization that ultimately was the cause of technology.

For Feenberg (2000), despite their radical opposition, both theoretical frameworks are related, since, for example, both share a certain radical attitude toward technology: take it or leave it. In both cases technology would be part of a supposed destiny of humanity. To respond to this situation, the only way that it can be maintained is to set certain limits for it, which would generally be moral and/or political in nature. In view of this situation, Feenberg (2000) raises a critical theory of technology that traces a difficult journey between resignation and utopia (p. 10) that originated by combining insights (instrumental and substantive) into a common framework called the theory of instrumentalization (2005, p. 112).

Feenberg's theory of instrumentalization (2005) states that technology can be analyzed at two levels. The first corresponds to the original functional relationship with reality while the second involves the level of design and implementation. The relationship with reality refers to the

dehumanization processes by which objects are uprooted from their contexts and exposed to analysis and manipulation by positioning subjects in a remote control. On the other hand, the level of design and implementation involves the possibility of integrating these with other existing mechanisms and systems with various social constructions, such as ethical and esthetic principles. To illustrate this in simple terms, it can be said that the first level simplifies the objects for their incorporation into a mechanism, while the secondary level integrates these objects into the natural and social environment. This is precisely what Heidegger called unveiling a world.

In short, for Feenberg (2000) technology is not one thing, in the ordinary sense of the term, but an ambivalent process that implies distinction of supposed neutrality by the role attributed to social values in the design. Within this vision, technology is not a destination, on the contrary, it is a dispute scenario. It is a social battleground in which civilizational alternatives are debated and decided.

Finally, it is impossible not to mention Melvin Kranzberg's thesis (1986), who somehow manages to catch the main problems about technology:

- Technology is neither good, nor bad, nor neutral.
- Invention is the mother of necessity.
- Technology comes in big and small packages.
- Although technology can be a key element in many public issues, non-technical issues are the primary factor in technology policy decisions.
- The story is relevant, but the most relevant story is the history of technology.
- Technology is a human activity, as is the history of technology.

Whatever the position regarding technology and science, what is agreed is on its enormous impact on contemporary societies framed within a logic of capitalist modernity and development. Education is a small area that can be analyzed based on its link to technology.

Science, technology and education

The world, as it is known, has had a great impact of technology and science, however, the truth is that its presence has meant a reorganization of the material and symbolic forms of life production that has involved



a profound crisis, from which different theoretical frameworks have emerged to explain the new reality. Marco Raúl Mejía (2020) systematizes some of the most representative attempts to conceptualize this era:

The way of naming these changes emphasizes the most visible element that constitutes them, according to the author who states it: Knowledge Society (Drucker), Information Society (Adell, Sally), Third Wave (Toffler), Informational Society, Post-Industrial Society (Bell), Techno-Science Society (Latour), Post-Modern Society (Vatimo), Individualized Liquid Society (Bauman), Network Society (Castells), Entertainment Society (Debord), Power-society (Negri), Risk Society (Beck), Consumer Society (Baudrillard), Control Society (Monjardet), Biomolecular Society (Kaku), Quantum Society (Zohar), Aquarium Era (Fergusson), New Era (Heelas), Frugal Abundance Society (Latouche), Shortage Society (Caven), Post-Consumer Society (Eguizábal), artificial societies (Epstein), transhuman society (Kurzweil), posbiological society (Pijamasurf), among others (p. 23).

In all these attempts, it is also essential not to lose sight of the important role of questioning the assumptions on which the Euro-American power is based and its corresponding hegemony from epistemic, conceptual and technological centers (p. 24). In this way, the limits of growth-based theories are revealed by questioning: economy based on infinite growth, human-dominated nature, endless progress, universal epistemologies that deny difference, development understood as a fixed place denying the different, among others.

From the other side of the world, the reflections of Gabriel (2016) and Badiou (1999) have also highlighted the need to explore new paths of dominant scientific positivism and its opposite extreme, which has gained more ground, cultural relativism and the corresponding impossibility of access the truth. These contributions must be moved to the educational field where science and technology cannot be considered as dystopias. It is necessary that a path to new realisms be rebuilt to consider multiplicity and move away from the monopolies of knowledge and truth marked by purely instrumentalist and utilitarian logic under commercial logic.

Paradoxically, however, when talking about the twenty-first century, the first thing that comes to mind is the great technological, scientific transformations and their goodness in making lives easier and more comfortable. It is important to remember, as mentioned by Aguilar (2011), that technologies of a culture condition its form of organization, as well as the worldview of a culture conditions the technologies that it is willing to use (p. 155). The field of education is no exception, but the

existence of a great educational transformation is far from reality. The hegemonic educational model begins to be shaped in the 16th century as Varela and Álvarez mention (1991), and has barely changed since then.

However, it is important to clarify that the current and precise model of public school, free and compulsory, has been instituted [...] at the beginning of the 20th century, as Varela and Álvarez indicate (1991, p. 14). But, what has been the role of technology and science in recent times? If observing technology as an instrument, its equivalent in the educational field is undoubtedly didactic or more accurately the didactic resources. Regarding science, it is the foundation of what is taught in school, and the dominant mentality has made that the only thing that is worth teaching is what is useful, following pragmatic criteria that have privileged the teaching of exact sciences to the detriment of other kinds of disciplines that are not valuable from this purely utilitarian and commercial approach such as the arts and the human sciences.

One of the accusations to 'traditional school' in the field of education is the use and abuse of the word by the teacher, who is the owner of science and knowledge in the classroom, who sees the close-minded approach of the school where the exterior world rarely penetrates in the classrooms through some books, a few geometric bodies, some maps and posters, together with the tools for writing as Gimeno says (2012, p. 132). It will be technology that will expand this repertoire of instruments in the classroom. The problem, however, is that the limitations are not only focused on the absence of artifacts but on the institutionalized model, which has been historically and conceptually shaped. It is not only about incorporating more technology into the classroom, but also about changing the positive scientific vision under utilitarian and mercantile parameters that continues to dominate education in the twenty-first century.

In this context, it is impossible not to talk about the well-known information and communication technologies (ICTs). Like previous reflections on technology, ICTs are presented as encouraging and worrying elements. According to Gimeno (2012) it is based in the fact that recent use of technology into the classroom reflects not so much the use of technology in the service of education, but the usurpation of education in the service of technology (p. 133). It can also be added that ICTs can be very profitable for certain companies, without producing the promised results in the learning processes, and becoming uninhibited consumers of cheap devices of rapid expiration (p. 133). ICTs are new not simply because of their recent emergence, but because they present innovative



and novel possibilities. To get an idea of the pedagogical implications, as for Gimeno (2012), the following information can be highlighted:

First, it is necessary to bear in mind that ICT, to an even greater extent, integrates a large number of auditory, visual and kinesthetic stimulation that present a great challenge to traditional forms of communication in the classroom. In this way, there is the possibility of accessing to an uncomprehensive amount of differentiated and varied learning materials that are usually presented more attractively for learners.

Second, it can be observed how accumulation capacity increases exponentially, allowing teachers and students to find knowledge accessible in different media. It is also important to consider that disciplinary barriers begin to disappear as information is presented integrated.

Thirdly, access to the digitized cultural heritage is easier to access at anytime and anywhere, something that the school has not been able to achieve to this day.

Finally, it can be mentioned that ICTs can revolutionize the way for communication, as well as collaboration in group tasks, where it is now possible to exchange information and opinions in real time, allowing virtual cooperative work between students and teachers.

In this sense, it is interesting to see how ICTs have radically changed the way human beings have lived in recent years, and only by looking at the huge fields of application its impact on education starts to be considered. However, the case is that ICTs are already educating us, not in the field of formal education, of course, but in the informal field. As mentioned by Gimeno (2012), ICTs are already educating us because they change our lifestyle, the ways of working, our relationships with others, as well as references to our identity (p. 137).

At this point the most important thing is to consider that the revolution of technology and science has already directly impacted in the field of education, which is not reduced to formal processes taught in the classroom, but it covers all the ways of living. Now, having this clear, the main point of reflection is being able to read the possibilities of ICT and the change of scientific approach in the field of education within the spaces and school where very diverse pedagogic activities and tasks are carried out as didactics, evaluation, management, ongoing training processes, school assignments, teaching resources, among others.

There is no doubt that science and new technologies make it possible to speed up all the aforementioned processes, and this has been extensively and thoroughly documented in recent times. In fact, the information or knowledge society, if this differentiation is made as Gimeno



(2012) states, is one in which the generation, process, mastery and propagation of knowledge promoted by ICTs become sources of wealth and transformation of productive activities (p. 147). However, it is important to consider the large inequality gap even between groups of different ethnicities, taking into account gender and social class.

In this educational context emerged a new concept called Learning and Knowledge Technologies (LKT). Generally, when referring to ICTs, reference is made to computer or digital skills linked exclusively to information and communication technologies, however, in the educational field, the aim of the LKT is to orient ICT to specific and differentiated uses framed in the formative processes of students and teachers, whose aim is to learn more and better, Lozano (2011, p. 44).

In this sense, the interest is no longer so much on the fact that competences related to informatics are developed, but there is a more methodological application, i.e., to emphasize their uses and to know what can be done with technology (p. 46). Hence, the idea is to move from technology learning to learning using technology. This logic could be framed in approaches such as those made by learning to learn. This pedagogical motto is related to the so-called constructivism that, in a very synthetic way, following Martin (2011), refers that knowledge is a construction of the human being, which is conducted from the cognitive bases that he already has (p. 24). This causes several consequences at the didactic level, mentioning that the teacher is a guide or mediator in charge of providing the tools or inputs, so that students can generate their own learning in general terms.

However, according to Martin (2011), LKT are not reduced to a paradigm or pedagogical current, but rather they directly affect the different educational practices, called 'connectivism'. This techno-educational interaction can be linked directly to the so-called Web 2.0, which reopens the educational debate in a complex and plural context.

Connectivism would suggest that learning is based on the desire to learn and is only achieved through learning on the network. In this sense, Web 2.0 especially values the Internet, blogs, wikis, educational virtual platforms, among others, as they reflect the intention to promote the collective recreation of knowledge through the integration of personal and collective intelligence into learning.

However, it is necessary to mention, in line with the approach of Philip Meirieu (2013), that:

(...) The issues of self-evaluation, meta-evaluation, metacognition and self-regulation are far beyond technical issues. These are deeply



political issues that occupy the aims of the school and the democratic project (p. 49).

Thus, the dispute is not so much didactic, scientific or technological, but political. The author considers that the challenge is not only to teach with technology, but to turn them into tools that allow to improve the learning of all students by reducing inequalities; to promote their social development; to strengthen their moral autonomy and finally to educate socially capable individuals to integrate and learn in a plural and multicultural society, as mentioned by Diaz (2011, p. 160). If technology and scientific approaches do not contribute to these goals, its use in the educational field will be limited to that of a didactic resource that will allow to achieve some kind of functional and non-significant learning to a particular hegemonic order that constantly reproduces and strengthens inequalities. Therefore, a theory of technology mediation in the educational field and a broader view of science that even addresses other paths of access to knowledge and truth are chosen.

Conclusions

This article has made a brief review of the problem of truth, science and knowledge in a world marked by technology. To this end, the current state of philosophy has been observed in the light of the main currents of thought, from where these problems are analyzed, leading to the approaches of the French philosopher Alain Badiou and Markus Gabriel. Together with these authors, the hegemonic, constructionist and cultural relativism, whose fragility has been observed by showing its deep internal contradictions, has been examined. From this questioning, attempts have been made to rebuild the step toward a new realism.

With regard to technology, it has been possible to place its emergence in the historical rupture with the technique generated from the scientific revolution and its subsequent application in different fields that led to a radical change in the ways of understanding and inhabiting the world. Regarding the reflections on what is now called technology, there are two philosophers who were able to foresight the problems that are currently being experienced. In this way, Heidegger's views are opposed, on the one hand, because he sees technology as a potential danger to humans and, on the other hand, Ortega y Gasset's vision who considers technology as consubstantial to humans, i.e., a means that allows them to live fully in the world, modifying nature. These two antagonistic posi-

tions have marked the present of the reflection on technology and science that has incorporated new elements into the debate resulted from the so-called fourth industrial revolution.

As a result of this debate, it has been observed that reflection on technology goes beyond political and social dimensions. As far as the educational field is concerned, its impact is undeniable as its potential to speed up certain processes and educational mechanics. At the same time, technology, without clear teleology, can become a barrier to achieving meaningful learning. In this regard, the proposal that is being made is that any type of technology should be framed in a socio-political aim of reducing inequalities and social justice, where education is a privileged field of action.

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ALAIN BADIOU AND EDUCATION AS A PROCESS OF SUBJECTIVATION THROUGH TRUTHS

Alain Badiou y la educación como proceso de subjektivación a través de verdades

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Abstract

The following text presents some theses about what the work of the French philosopher Alain Badiou can contribute to the debate about the current situation of education. To do this we will read his work from a propaedeutic point of view. Our starting hypothesis is that his work can be read as a project of recovery of philosophy understood as an education through truths. To locate this thesis in the contemporary educational debate we will use the theory developed by Gert Biesta, who has built in recent decades a system of thought that offers a theoretical framework in order to ground alternative educational proposals to individualistic, functional, mediating and controllable tendencies of the dominant neoliberal model. For Biesta (2013a), education has undergone a learnification process which prioritizes its socializing and qualifying functions and forgets its subjectivizing function. The text will argue to what extent the education model proposed by Badiou contributes to recovering the subjectivation function of education. Education as a process of subjectivation through truths would offer teachers the possibility of encouraging educational experiences that interrupt the individualizing, functional, mediating and controlled character of the hegemonic educational model. The text claims for giving greater importance to Alain Badiou's thought within critical pedagogy when it comes to establishing educational proposals according to more democratic and cooperative teaching models.

Keywords

Badiou, Biesta, truth, subjectivation, education, learning.

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Resumen

El siguiente texto presenta algunas tesis acerca de lo que puede aportar la obra del filósofo francés Alain Badiou en el debate acerca de la situación actual de la educación. Para ello se hará una lectura de su obra en clave propedéutica. La hipótesis de partida es que dicha obra puede leerse como un proyecto de recuperación de la filosofía entendida como una educación a través de verdades. Para ubicar esta tesis en el debate educativo contemporáneo se utilizará la teoría elaborada por Gert Biesta, quien ha construido en las últimas décadas un sistema de pensamiento que ofrece un marco teórico con el que fundamenta propuestas educativas alternativas a las tendencias individualistas, funcional, mediadora y controladas del modelo neoliberal dominante. Para Biesta (2013a), la educación ha sufrido un proceso de 'aprendizaje', que prioriza sus funciones socializadora y cualificadora y olvida su función subjetivadora. El texto argumentará en qué medida el modelo de educación propuesto por Badiou contribuye a recuperar la función subjetivadora de la educación. La educación como proceso de subjetivación a través de verdades ofrecería a los docentes la posibilidad de fomentar experiencias educativas que interrumpieran el carácter individualista, funcional, mediador y controlado del modelo educativo hegemónico. El texto reivindica mayor influencia del pensamiento de Alain Badiou dentro de la pedagogía crítica a la hora de fundamentar propuestas educativas acordes a modelos docentes más democráticos y cooperativos.

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Palabras clave

Badiou, Biesta, verdad, subjetivación, educación, aprendizaje.

Introduction

Alain Badiou is the name of one of the most important French philosophers in life. But it is also the name of a mathematician, a political activist, a playwright and a novelist. Few contemporary philosophers are so versatile and show such a heterogeneous set of disciplines in their philosophical arguments. In the face of the trend toward the specialization of contemporary knowledge, its texts show not only a domain of terminology that is typical of philosophy, but also of politics, psychoanalysis, mathematics, science, universal history, history of art and filmic, literary, poetic or theatrical studies.

His work has inspired different theorists to explore the consequences of their thinking in various disciplines, resulting in publications in international prestigious journals. However, compared to what was said in other areas, little has been mentioned about how his thinking influences the contemporary educational situation. Among the most outstanding works in the Anglo-Saxon language, one of the first in this regard was the work carried out by Cho and Tyson (2005). These authors analyzed, in line with Freire's pedagogical proposal, the potential implications of the most relevant concepts of the French philosopher in educational theory and practice.

Exploring the educational implications of Badiou's work and relating it with established education theorists has been a common strategy in much of the texts that continued this task.

A highlight is the publication of a special issue in the journal *Educational Philosophy and Theory*. Much of the texts appearing in that issue sought to justify the pedagogical reading of Badiou's thought in contrast to some of the most relevant theories of education of the twentieth century. For example, Kesson and Henderson (2010) related Badiou's philosophy and ethics to American curriculum theorists such as Dewey, Green, Eisner or Pinar; while Sthran (2010) related to critical pedagogy theorists such as Apple and Ozga.

For his part, Jagodzinski (2010) articulated the concept of Badiou's unesthetic through the three Lacanian records (real, symbolic and imaginary) and the works of Deleuze and Rancière. The latter philosopher, although not specifically a pedagogist, appears as a very present theorist in many of these educational studies about Badiou's work thanks to his work *The Ignorant Master*.

Thus, while Jagodzinski (2010) highlights the disagreements between Badiou and Rancière in the field of aesthetic education, Barbour (2010) does the same in the field of political education.

It is also worth noting the work of Den Heyer (2009), who uses the key concepts of Alain Badiou's thought to make a curricular proposal for ethical education based on Doll's curricular theory (1990). It is also important the work conducted by Bartlett (2006, 2011) who bases the theory of education through truths on Platonic thought. In studies carried out in the Spanish language, we found those conducted by Cerletti (2008, 2013), García-Puchades (2011b, 2013, 2016) and Colella (2015, 2016 and 2018). They all use Alain Badiou's subject theory to propose educational models opposed to the dominant neoliberal model. For this task, as for many of the theorists mentioned above, it is constant the relation with Jacques Rancière and his work *The Ignorant Master*.

In line with these works, the following text continues to explore the consequences of Alain Badiou's thinking in the debate about the contemporary educational situation. Unlike the previous proposals, this paper will be based on Gert Biesta, an education philosopher who has built a system of thought to base educational proposals alternative to the individualistic tendencies inherent in the dominant neoliberal model.

This paper has two main objectives. First, to justify to what extent it is possible to think of Alain Badiou's work as a recovery project of philosophy understood as education for subjectivation (or emancipation)

through truths. Secondly, to place the proposal for philosophical education of Badiou in a theoretical framework elaborated specifically in the philosophy of education and thus to favor the application of his thinking in that field. In short, this study aims to ensure that those theorists critical of the dominant educational model find in the French philosopher's thought a conceptual approach to justify other alternative and more democratic models.

To carry out this task, the text will argue, first, to what extent Badiou's theory of the subject can be understood as a philosophical education through truths. Later, the main theses in which Gert Biesta's criticism of the current situation of education will be presented, particularly, his theory about educational functions. Finally, to conclude, it will be argued to what extent the notion of education through Badiou's truths fits and complements Biesta's educational theory, being an excellent tool for thinking alternative educational proposals to the dominant ones.

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Alain Badiou's work as philosophical propaedeutic

Although Alain Badiou's work is difficult to address because of its multidisciplinary nature, his texts do not show all this diversity in a disconnected way, but they can be related by a vector that converges them toward a common orientation, namely the didactic exposure and transmission of the idea of 'contemporaneity'. For Badiou (2010a, 2010b), the philosopher must not, in any way, give up thinking and presenting with clarity and systematicity the time in which we live as vague as it may seem. It is the work of philosophy to show the present in a systematic way, i.e., to obtain its image or, in Plato's words, to access its idea (Badiou, 2010b).

However, for Badiou (2010a, 2010b), an idea is only clearly shown around the event. Understanding as 'event' the emergence of a moment that interrupts the dominant knowledge of a given historical situation and requires each of its elements to position in relation to it:

The event structures a situation according to two types of logical figures: an exceptional figure, which Badiou calls as 'truth', which seeks to transform the situation from the new generic logic that evidences the event, and a dominant figure that reacts to the exceptional logic of the event to try to weaken it and thus return to the pre-event situation [*pré-événementiel*]. For Badiou, moreover, the exceptional figure or 'truth' can evolve into dark and violent logical figures that would seek the complete destruction of their opposite figure from the application of fictitious forms (García-Puchades, 2012, p. 24).

For Badiou (2011) only the event can structure a situation and condition the philosophical task of thinking the present. In other words, for philosophy to clearly show the idea of ‘contemporaneity’ there must be events capable of creating post-event figures. These figures are called by Badiou (2008a, 2010b) as subjective figures or, quite simply, subjects. Therefore, a subject is a logical and emotional result of an event. The philosopher’s task is to identify his faithful, reactionary and dark figures, thus drawing up a theory of the subject of the present.

However, for Badiou (1990, 2003), the history of humanity has shown that there have been four areas in which events have taken place, and therefore subjective figures: art, as a formal revolution of an artistic discipline; politics, as an emancipating political revolution; science, as an epistemological revolution; and love, as a revolution in the life of a couple from the loving encounter. The philosopher must be attentive to these four areas to identify the existence of contemporary subjective figures, if any:

[I]n the artistic realm, the existence of new formal configurations (artistic truths) that break into the dominant trends of spectacular, multicultural art, without falling into the nostalgia of classical art; the political arena, the existence of new emancipatory and egalitarian movements (political truths) that break into unequal policies without falling into past totalitarian formulas; in the scientific area, the existence of new epistemological methods (scientific truths) that break into scientific methods dominated by technological innovation and industry without falling into old dogmas; in the loving realm, the existence of new processes of love (loving truths) that break into the debauchery and counteractualist conceptions of the couple without falling into romantic figures (García-Puchades, 2012, p. 26).

For Badiou (2003, 2010b), the task of philosophy is to present the idea of contemporaneity by making ‘congruent’ the subjective figures of each of these four figures. However, just as it was for Plato, for Badiou (2010a, 2011), the philosopher must not be satisfied with having an intellectual representation of the idea, but must also convey it. This transmission, unlike the Platonic doctrine, must not be directed to few elected people, but must aspire to be universal and democratic. In other words, the work of philosophy is to transfer the idea that any individual can take part in the present he is living if he is previously aware of artistic, political, scientific and loving developments. Following Bartlett (2011) and García-Puchades (2013), this section can be concluded by stating that the originality of Badiou’s thought lies in the defense of a philosophy



understood not so much as theoretical elaboration of the idea, but as a pedagogy of its transmission from the truths existing in an era.

Philosophical education as a subjectivation process through truths

For Badiou (2008a, 2008b), philosophical education is an education that aspires to the intellectual emancipation of the individual, insofar as the encounter with a truth as a novelty with regard to dominant knowledge in an era; it allows to decide whether he wants to be subject of his acts. In this sense, for the French philosopher, the subject would correspond to the set of finite elements that allow truth to remain active over time. Thus, philosophical education must be understood as a process by which a person discovers the existence of the subject of current truth (Badiou, 2010a). This process is called subjectivation process. At the end of that process, a person can decide whether to be responsible for his actions and to look for truth.

Philosophy, as a subjectivation process of individuals, deviates through truths from an academic conception of philosophy, as university discipline linked to a theoretical body of knowledge. The philosophical model defended by Badiou (2010a) is based on Plato's thought. As for Plato, philosophy for Alain Badiou (2017b) must be understood in the educational process intended for the formation of the citizen. Philosophy is not education, but one of its attributes. In this way, education may or may not be philosophical. In this sense, non-philosophical education would be useful in developing competences and socializing individuals in ensuring the proper functioning of the city. However, in Badiou (2017a, 2017b), philosophical education would aspire to allow every individual to reflect on how to transform the city organization so that all citizens can live a happy and dignified life. A philosophical education should include a thought about a radical novelty, but not any novelty, a universal and eternal novelty. A novelty that is capable of integrating the happiness of all and not just that of a few. From this point of view, for Badiou (2017b) the political nature of philosophical education fosters continuous reflection on how to achieve a fairer world: a world in which anyone can participate in the organization with the intention of living a dignified life.

In other words, according to Badiou (2011), in order to achieve the philosophical idea, a type of education is necessary that allows the citizen to reflect on the organization of the city in terms of novelty and



universality. In Plato's time, this implied a break with the *status quo*: at a time when consensus dominated around language relativism and the idea that the validity of opinions depended on the good use of rhetoric, any attempt to defend a universal opinion was classified as dogmatic. In that context, philosophical education for Plato had the task of transforming that consensus and ensuring that every citizen could believe that there are not only relative opinions, but also universal opinions.

But what was the difference between a relative opinion and a universal opinion in Plato's thought? While relative opinions have validity criteria that are known only to one individual, universal opinions have transparent and accessible validity criteria. A universal opinion has truth as its reference, because truth is nothing other than an object to which all people have access to and can prove its validity. For example, within his dialogues, Plato uses the Pythagorean theorem as an example of mathematical truth about which a conversation between equals occurs. Anyone can participate in it freely with different opinions.

However, as the conversation progresses, Socrates strives for all particular opinions to be referred to as theorem, so that these progressively become universal opinions. The end result is a consensus on the true meaning of Pythagoras' theorem.

In short, Badiou's (2019) proposal for a philosophy seen as a subjectivation process could be understood as a translation of the Platonic theory of philosophical education applied to contemporary moment. For Badiou (1990, 2003, 2008b), this translation is mainly based on a reinterpretation of his idea of truth, which focuses on five points: (1) truths are not abstract, but have a material and immanent dimension; (2) there is no truth, but multiple truths; (3) truths are distinctive interruptions of existing knowledge; (4) truths are universal because they can be recognized by anyone, but cannot be described in existing language; (5) truths are eternal, but they do not have to be visible in all ages. Each of these points will be discussed with more detail below:

- First, truths are not abstract entities, but procedures that have a material component. Truths are not immaterial entities, nor hidden thoughts in an individual's mind. They possess a corporality that is oriented by a subject within a particular situation; hence their immanent component. All truth is presented by his subject. For that reason, for Badiou (2007, 2008a), there are political, artistic, scientists and loving subjects. The corporality of the political subject is made up of the individuals of the social



movements; the artistic is made up by the different works and their material component; the scientific is composed by the declarations, formulas and theories; and the loving one is made up by the individuals who share together their life in a couple relationship.

- This would lead us to the second point: there is not one truth, but multiple truths. The political truth would correspond to the movements of popular emancipation; the scientific to the consequences of their epistemological revolutions; the artistic to the formal revolutions carried out by the artistic movements; and the loving to the revolution in private life that begins with a declaration of love.
- Thus, given their revolutionary character, truths are shown as perturbations of current knowledge. Truths are interruptions of the knowledge that dominates the realm of politics, science, art and love. Within the policy sphere, truth is subtracted from the way political or trade union institutions organize themselves. Within science, a truth is an exception to existing scientific theories. In the world of art, truth escapes the narcissistic artist's way of acting and the laws of the art market. And in loving relationships, truth eludes a romantic and unitary conception of the couple, the marriage contract and sexual freedom.
- The fourth point would reinterpret the universal character of truths. For Badiou (2007), truth is not universal as a consequence of a particular knowledge, but because of the interruption of that knowledge. So its intelligibility structure is outside of any existing knowledge regime. For this reason, its elements are presented without identity, without property, according to the dominant symbolic regime. This is therefore a generic logic that demonstrates equality between its elements. However, there is not a single generic logic, but there are many. The generic logic of a political truth would affirm that every person can belong to a group without any distinction of race, nationality, social class, etc. From an artistic point of view, its generic logic would affirm that every form, musical note, work or frame can be part of an artistic composition, regardless of the artistic movement to which it belongs. The generic logic of a loving truth would affirm that every person can live a life with a couple, whatever their sexuality, social class, wealth, etc. And finally, from the point of view of scientific truth, generic logic would



affirm that any statement can be analyzed by this theory, and thus contribute to improving its coherence, whatever theory it belonged to.

- Finally, the fifth point would reinterpret the eternal character of truths. For Badiou (2007), truths have an eternal language, but their appearance is intermittent. Truths have appeared and will appear at any time; however, they are not always present. Truths re-emerge in an unpredictable way, thanks to their infinite nature.

Thus, for Badiou and Plato, philosophical education is not linked to the qualification and socialization of a citizen, but to his transformation into a subject. Thinking of education as a subjectivation process means to encourage an individual's reencounter with the subjects of truths (political, artistic, loving and scientific) of an era. For this reason, for Badiou (2011), the professor must organize educational situations in which there is dialogue about the existence of these truths, about the presence of logic that cannot be explained or classified with the existing knowledge in art, politics, science and love. Within these dialogues, students should analyze whether it is true that this logic is exceptional. The challenge of the professor, like the Socratic professor, is to ensure that the validity of the opinions affirmed can be contrasted by any of the participants, so that the debate ends with a consensus about the generic, exceptional and eternal nature of the logic identified.

However, what place does the idea of education outlined above occupy within contemporary theories of education? This notion of education as subjectivation through the truths outlined above would fit and complement Gert Biesta's theory of education. For Biesta (2006a, 2010), education has been suffering a learnification process that reduces its functions to socialize and qualify students.

As a consequence of this process, subjectivation, a third educational function, has been neutralized. Biesta (2013A) affirms that a quality and democratic education requires that this function be restored, and that occurs by interrupting the learnification process of education. It will be shown on what measure education helps to recover the subjectivation function of the education, interrupting the learnification process. At the moment, the education theory proposed by Biesta and the role that subjectivation plays in it is developed.



Gert Biesta: Educational subjectivation as an interruption of learning

For Biesta (2010) the element that constitutes good education must be able to respond to three functions: socialization, qualification and subjectivation. The socializing function offers the opportunity for different individuals to be part of a social, cultural and political order. The socializing use of education is established when certain professional, cultural or religious traditions transmit norms and values with the intention of preserving and maintaining such traditions. The qualification function provides children, youth and adults with the knowledge, skills and abilities that allow them to do something. This function is one of the main reasons for justifying public education. This is mainly due, but not exclusively, to its relationship with the preparation of an adequate labor force that favors the development and economic growth of a country.

However, for Biesta (2017), education should not be limited to providing opportunities for children and young people to maintain certain orders (social, cultural, religious, etc.), but it should provide them opportunities to act for themselves regardless those orders. The subjectivation function offers students the opportunity to become responsible subjects for their own actions and thoughts. In this sense, subjectivity is something that the faculty cannot teach voluntarily, since if so, the students would no longer be responsible of their own actions. Subjectivity arises in an eventful and unpredictable way. For this reason, the function of subjectivation differs from socializing and qualifying in that it is not instrumental, since it is not linked to a previous knowledge that allows the faculty to plan it. In this sense, Biesta (2010) points out that subjectivity can only be experienced at times and always as a consequence of the encounter with new, unexplainable and unpredictable situations. At this point, Biesta's proposal for subjectivation is similar with the theorized creation process of Collingwood (1938) in his theory of art. For this author, artistic creators do not produce because they are not acting with the intention of achieving an end or following a preconceived plan.

However, although the faculty cannot force or plan the subjectivation of students, for Biesta (2013B) the effort should be done. To achieve this, the professor must create educational situations that favor difference and plurality (Biesta, 2006a, 2010). On the one hand, the subjectivation of an individual is linked to the experience of a 'new beginning', an act of radical creativity in and with the world. Faculty should offer students the opportunity to take actions beyond conventional knowledge assumed by



a community. Reviewing Linguis's theories (1994), Biesta (2010) considers that in the absence of knowledge, an individual can only use himself to seek new possibilities for action and relate to the world around him through new meanings. Only on those occasions can an individual not be replaced by another individual, so he experiences himself as fully responsible of his action.

This takes us to the second characteristics of subjectivation: plurality. Biesta (2010) adopts this concept from Arendt's theory of democracy (1979). For both authors, every act of radical creativity represents a demonstration of our freedom, but this act is not solipsist, but is subjected to its consequences on others. Hence, a person is a subject of an action only in situations where his creative acts are adopted by others, so that they are also an opportunity to carry out his own creative acts. In this sense, subjectivity also requires the experience of democratic plurality.

By introducing plurality as a requirement of this experience, Biesta (2010) manages to take subjectivation, and thus the uniqueness of an individual, out of the private sphere. Uniqueness is not something that depends solely on oneself, but on a public or intersubjective situation. This conception of uniqueness has its foundations in the work of Linguis (1994). For this philosopher, the unique character of a human being is only given in situations where it is irreplaceable. Uniqueness is not something that makes someone different, but something that makes this person unique in a given situation. The important thing about this nuance is the place where uniqueness is located. For Linguis (1994), identity is not a set of different characters which makes an individual unique. It is the situation that makes an action unique. The uniqueness of the situation requires the individual to perform it and not another. But when is a situation unique? When it does not require someone to act by using the knowledge obtained from the speeches and practices of the community or tradition he belongs to. If so, it could be replaced by any other community member who had the same knowledge. Thus, in these situations where knowledge as a member of society cannot be made to serve, it is the responsibility of acting as a single individual, as a subject. As Biesta (2010) says, for Linguis (1994), there is a rational community that shares a relational structure and 'other' community that presents the problems of such a structure. An individual lives most of the time in the rational community, acting in agreement with such a structure; however, occasionally the 'other' community appears in the need to act on the sidelines of such structure. It is in these times when an individual is responsible for his actions.



As shown below, placing the subjectivity of the individual in the situation or context brings Biesta's theory of education closer to the materialistic premises on which Alain Badiou's subject theory is held. The education through truths proposed by Badiou offers the opportunity to create these unique and pluralistic situations, those 'other' communities in which any individual can experience as the only individual responsible for his action. In the next section we will develop this idea. For the time being, it will be argued to what extent the current situation of education limits subjectivation and its functions to qualification and socialization.

The dominant educational situation: education as a learnification process

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For Biesta (2013A), in recent decades, education has undergone a *learnification* process that is evident in the way the language used in the educational field has been transformed: it differs from 'teaching' and 'learning'; professors are considered as 'mediators' or 'facilitators of learning'; and the school is considered a 'learning environment'. This language has been consolidated as a result of a number of developments:

1. the impact of new learning theories in the field of psychology that have led to the emergence of theories, such as constructivist, that focus its attention on students and their activities rather than on teachers and their contributions, as studied by Fosnot (1996) and Lave and Wenger (1991);
2. post-modern criticism of authoritarian forms of teaching which, according to Giesecke (1985), has shifted the emphasis from teaching to learning, to the extent that it has questioned the idea that educators can free and emancipate their students;
3. The 'silent explosion' of learning analyzed by Fiel (2000), which emphasizes its diversity in adult education; and
4. The individualizing impact of liberal policies on education transfers the duties and responsibilities of the State to the individual's duties and responsibilities (for example, attributing social and political problems to learning problems). As Biesta (2006b, 2013A) and Fejes (2006) claim, this change of perspective makes learning not to be associated with the search for an 'inner treasure', but to a personal pressure: lifelong learning internalizes the governance process of the state as a necessity.

For Biesta (2010, 2013B), the current debate on the situation of education is limited to reflecting on how to rewrite the educational process in terms of an economic transaction between the students, the professor, the educational institution and the market. This debate would take place assuming a consensus on the four pillars of a learning process:

1. individuality, in which the idea is to satisfy the desires of a student who knows or should know what he or she wants to study and why he or she wants to learn it;
2. functionality, insofar as these desires are adapted to the professional needs of society and the demands of a global economy;
3. mediation, to the extent that the educational institution and the faculty offer opportunities for students to acquire knowledge and flexible skills that enable them to integrate into society;
4. measurability, as they aspire to achieve results that must be quantified to determine the effectiveness of the process and offer reliability to the professor.

However, for Biesta (2006b, 2010), conducting this debate on the basis of a consensus on these four pillars leaves aside the question of what good education is and what its functions are. This involves a risk to the extent that this consensus hides the way in which the educational process has limited its functions to socialization and qualification. The learning process, understood as an effective acquisition of knowledge and skills according to the social needs of the individual, avoids thinking about the subjectivation of the students, because while qualifying and socializing education purposes contribute to empowering individuals to act in an existing socio-political configuration and provide them with adequate skills and knowledge, the subject is oriented towards emancipation and, therefore, to the transformation of the existing order, because he presents or embodies in his own action different ways of doing.

In this sense, Biesta says (2010, 2013A), to aspire to a good education means to recover its subjectivation function through the construction of educational situations that are different and pluralistic. To do this, it is necessary to break the consensus on the essential features on which the learnification process is based. This involves recovering an education that is not only based on the promotion of particular learner satisfaction, the acquisition of useful knowledge and skills, the application of a mediator, or a control system that measures its efficiency.

At this point, it is appropriate to mention the educational consequences derived from Alain Badiou's subject theory in the review of the

educational situation proposed by Gert Biesta. The use of truths, as they are theorized by Badiou, in education would offer us the opportunity to create those unique and pluralistic situations that make subjectivity event more likely. In the next section we will show how the encounter with the truths of an era could interrupt the dominant learning process, since it generates educational situations that, being subtracted from hegemonic knowledge, are accessible to anyone and prevents them from being evaluated in terms of efficiency and utility.

Education as an interruption of learning by truths

As stated above, Biesta (2010), following Arendt (1977), justifies that education should not be seen simply as an instrument that prepares the student for something, but as a democratic space where individuals can be subjected to their actions and can carry out their 'new beginnings' in the world, so that they do not interfere in the beginnings of others. The question for professors is how individuals may be subject if subjectivation cannot be granted, planned or scheduled. For Biesta (2010, 2013B) the answer occurs because the professor needs to know that the logic of learning that dominates the current educational situation does not allow the student to own his actions, since these are determined by the existing orders. Education must interrupt such logic and place the student in an empty place in knowing that he legitimizes such orders, so that he can experiment as a subject of his actions while taking into account the possibilities of others to be subject. In other words, the objective of education should not only be socialization and qualification, but subjectivation for all.

Biesta (2010) has defined subjectivation as a 'coming to the world' in which the new beginnings are assumed by the others in a way that it does not prevent them from carrying out their own. In other words, the coming into the world of unique individuals can only be understood as a creative process that necessarily depends on the plural view of the world.

The challenge of a democratic education conception, where these situations based on the uniqueness and plurality of actions are included, is to answer the question of whether it is possible to interrupt the individualistic, functional, qualifying and controllable character on which the dominant educational process is based.

- The philosophical education implicit in Badiou's work offers possibilities for this interruption. For Badiou (2003, 2007), only with truth it is possible to carry out an action in which an-



yone can participate, and it cannot be measured or controlled by existing knowledge. Philosophical education, understood as a subjectivation process by truths, is a bypass of the dominant consensus. Indeed, this education would interrupt the consensus on the four pillars on which the debate on the current state of education is based:

- Philosophical education implies an interruption of relativistic discourses that originate individualistic theories of education. Subjectivation process develops in an educational situation in which individual opinions become universal opinions as a consequence of their adaptation to the principle of evaluative transparency: Every individual must be able to corroborate the statements of the other members. After all, the purpose of the generated debate is to build a consensus on the identification of the generic logic of the political, scientific, loving and artistic truths that exist today.
- Philosophical education implies an interruption of education as a functional instrument. Thanks to the subjectivation process, an individual experiences a radical rupture with knowledge placed at the service of the conservation and legitimization of a given order. For Badiou (2007), an individual becomes subject as a result of the introduction to truth, which could be called an impossible novelty. Contrary to possible developments, the impossible ones ‘permeate’ the symbolic regime of established knowledge that legitimizes a state of affairs. The possible novelty is predictable according to that knowledge, however, the impossible cannot be deduced or thought with it. For Badiou (2008a), subjectivation means participating in the consequences that result from giving the greatest existence to this impossible novelty for the dominant order in a situation. In other words, giving the body-subject maximum existence of a new movement of citizen emancipation, a new artistic movement, a scientific novelty or a loving relationship invites an expeditious practice within politics, art, science and personal relations, looking for knowledge that questions the functionality of the system.
- Philosophical education implies a rupture with the educational institution and, in particular, the professor as a mediator in the educational process. For Badiou (2010a), as for Biesta (2017), the professor cannot plan the subjectivation of students because



he does not know how to display truth in a particular situation. However, the professor can favor such subjectivation by presenting the exceptional character of the existing truths. Subjectivizing means placing the student in the abyss of communication, within the limits of rational discourse, with the intention of discovering for himself whether he wants to participate in the construction of an impossible novelty. In this abyss, the student discovers that there is no speech that can convey him. Truths interrupt the flow of knowledge that can be said and communicated. In reference to truth, no element of a situation can state something meaningful by making use of existing knowledge. However, truths do not cause the destruction of all forms of sense, but of those that can be articulated from a certain regime. Truths are unique experiences that cause a disturbance with what can be said with meaning in the field of politics, love, science and art. Within an educational context, the student understands that he must explore the indescribable structure of a truth on his own. But he also understands that, in order to validate the results of such exploration, his views must be able to be corroborated by any of those present in that context.

- Philosophical education implies a division with the logic of control and security. For García-Puchades (2011a), placing the truth at the center of the educational situation requires that the professor be unable to anticipate the evolution of the subjectivation process: He does not know the way his students should follow. Following Rancière (2003), there are only two postulates that guide him in this task: encourage students to continue exploring what they ignore by relating it to what they already know, and to make the validation criteria to transparent their results. Consequently, the professor, with the intention of subjectivizing his students, must take risks and locate the educational process at a certain distance from his comfort zone.

Conclusion

The text started by asking how Alain Badiou's work could contribute to the current debate about education. The starting point chosen is Gert Biesta's critique of the way education has undergone a learnification process, forgetting the question of how to implement its subjectivizing

function. Following the line of research of some contemporary authors, Alain Badiou's work has been analyzed from an educational perspective. This work presents an educational proposal for the subjectivation or intellectual emancipation of students based on the encounter with novel practices, called truths, in the field of art, politics, science and love. This proposal, read from Biesta's theory of education, would interrupt the dominant consensus on an education understood as a process of acquiring knowledge and skills individually justified, which is functional, completely measurable and guided by the authority of a mediator.

Education as a subjectivation process by truths would offer professors the possibility of fostering educational experiences based on creative and democratic research projects. The fact that these truths are exceptional in artistic, political, scientific and loving knowledge poses a risk in carrying out these projects, as the professor lacks of a model to measure, evaluate and control them. In this sense, the professor cannot be understood as a mediator, but as a researcher who participates with his students in the development of this project in terms of equality.

To conclude, it can be said that Badiou's work has much to offer to education theorists. Although she does not directly address the educational field in a systematic way, her work can be understood as an ideal space to present alternatives to the dominant educational model. Related with critical pedagogy, she offers a suggestive conceptual framework capable of basing educational proposals according to more democratic and cooperative teaching models



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SUBJECTIVE TRANSFORMATIONS IN CURRENT POWER DIAGRAM AND THEIR IMPLICATIONS IN EDUCATION

Las transformaciones subjetivas en el diagrama de poder actual y sus implicancias en la educación

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Abstract

The article delves into the question of power in regard to subjective transformations in the current power diagram, and addresses its particular relationships with education. Through the work of philosophers such as Han, Foucault and Deleuze, the conditions of the current power diagram are discussed; this operates over subjects, it is claimed, by means of an imposition to perform that is entangled with a power semantics which subtly forces certain meaning horizons. Subjects are self-exploited in a paradoxical freedom that compels through surplus of power positivity, and are anchored to naturalized meanings endowed with the strength of obviousness. These strategies affect the capacity of subjects and create several subjective discomforts. The work reflects on the implications of such control practices in the particular context of education through a philosophical approach, in an attempt to trigger a quest of emancipatory practices and subjective transformations in times when revitalizing subject power is urgent. These harmful restraints can be modified by the exercise of freedom in an aesthetic of existence, which is also an ethics and a politics of existence.

Keywords

Philosophy, education, subject, power, ethic, aesthetics.

Resumen

El presente trabajo explicita la problemática del poder en relación con las transformaciones subjetivas en el marco del diagrama de poder actual y se formulan vinculaciones con la educación. Mediante aportes de filósofos como Han, Foucault y Deleuze se exponen condiciones constitutivas del diagrama de poder actual, que opera sobre los sujetos mediante una imposición de rendimiento entramada con una semántica del poder que impone sigilosamente horizontes de sentido. Los sujetos se auto-explotan en un trabajo sobre sí mismos en una libertad paradójica que obliga mediante un exceso de positividad del poder y a la vez se atan a significados y sentidos naturalizados por la fuerza de la obviación. Estas estrategias alteran la potencia de los sujetos ocasionando diversos malestares subjetivos. Se reflexiona en torno a las implicancias que estos mecanismos de sujeción pueden tener en el ámbito educativo mediante un enfoque filosófico. La reflexión puede operar como alerta que oriente la búsqueda de praxis emancipatorias y transformaciones subjetivas en el marco de la contingencia donde resulta urgente revitalizar la potencia de ser y actuar de los sujetos. Los modos de sujeción perjudiciales pueden ser modificados mediante el ejercicio de la libertad en una estética de la existencia que es también una ética y una política.

Palabras clave

Filosofía, educación, sujeto, poder, ética, estética.

Introduction

This paper reflects on the pedagogical relationship between the professor and the student, which started in 2020 in the Philosophy of Education in the degree in Educational Sciences of the Faculty of Humanities of the National University of Mar del Plata, Argentina. The sustained dialogue between the professor and the student during the course, as well as the shared interest in the relationship between philosophy and education allowed to develop a reflective, questioning and problematizing process

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around the current power diagram, in order to critically present aspects that may affect educational reality.

The Philosophy of Education is both a theoretical practice and a philosophical practice whose epistemological, elucidatory and proactive ‘functions’ are complemented by a ‘function’ of resistance and liberation, as Kohan argues (1996); thus, analyses of the contributions of philosophers on the subject’s problem in relation to power contribute to the search for conditions that allow favorable transformations in education. Thinking of education as training, as López Morocho (2018) argues, states that education “can be seen as a machine that cannot be changed and therefore enters into a feeling of hopelessness” (p. 204); however, there is room for hope if fatalism is avoided and awareness-raising is advocated for educational practices that disarticulate this ‘machinery’ that, through diverse power devices, produces training in restraint.

To avoid the subjection of current power diagram, it is necessary to assume the situation of each individual involved in the educational field, who questions about his place in the world and his relation to himself and others as being corporeal and ephemeral, linked by time and space, history and contingency, nature and culture. As Mélich (2011) argues, nothing comes to us, but through the situation that affects us from the beginning, realizing our fragility, vulnerability and contingent way of being, and it is in that recognition where the hope of another possible world is present. This situation of individuals is crossed by a diagram of power that acts in a stealth but efficient way and has effects on subjectivity.

In this work it is argued that the current power diagram is constituted by conditions of the society of performance along with a semantics of power and this diagrammatic configuration affects individuals, causing subjective transformations in the ethical, esthetic and political sense that alter their power to act.

According to Han (2012) there is a ‘performance society’ in the 21st century, which requires individuals to carry out subjective transformations to submit to impositions that appear to be freely done, but what actually happens is that there is a positivity excess of power that forces subjects to the ‘extra mile’ to increase their productivity, so that they are created free by doing so. In addition to this, there is a ‘semantics of power’ (Han, 2012) that takes the subject into a network of senses and meanings that come from the outside; this way of power operates in a stealth and hidden way, preventing the generation of other senses that could well be created if the subject would identify that is on a horizon of senses,



since they are not questioned by presenting themselves as a dictatorship of obviousness.

The imposition of performance and power semantics make up a power diagram that is unstable because the relationships of forces in any diagram of any social field are unstable, this means that there are diagrammatic mutations; therefore, those mutations could, in case of resistance practices, bring about changes that would favor the situation of the subjects involved in these power relations.

The diagrammatic conditions and the effects on subjectivity presented below are also present in the educational field. It is important to think about the need to identify them, analyze them, and find ways to participate in the transformation of that power diagram.

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Diagram of power and subjectivity

In this paper, a 'diagram' of power is understood as an emission of affections corresponding to a social field, which according to Deleuze (2014) is a collective field. In power relations, which are relations of forces, a force always affects and is affected, "a force has active and reactive affections. Their active affections express the way in which it affects other forces, their reactive affections express the way in which it is affected by other forces" (Deleuze, 2014, p. 102). This work will be focused on these 'affections' or 'affectations', in the sense of a microphysics of power in the Foucauldian sense, because it is the best way to think about the power of subjects 'affected' by the power diagram.

Since education has effects on subjectivity, the nuclei of meaning inherent in current subjective transformations are addressed to think about the possibility that education will contribute to the creation of transformations that help shape forms of struggle, both against the individual's subjection to performance as an individual subjected to social normalization that subordinates him to an extreme self-demand over himself, as well as against the subjection to the semantics of power.

The individual's 'work on himself' in this society that prioritizes productivity and requires that subjects self-produce themselves (self-demand) to avoid in this way being excluded, marginalized or invisibilized in and by this society (governed by a logic of stealth power), generates unhealthy effects on subjects. In this externally induced self-poiesis, which is a form of ethical violence with political and esthetic derivations,

because what really happens is that in this ‘work on oneself’, subjects become discouraged.

De-empowerment is understood to be a detrimental irruption in the intensity of the acting power of subjects; this would be the paradoxical effect that the excess of positivity of power inscribes in the ‘free’ subjectivities.

It is worth mentioning that this work refers to ‘power’ in a spinozist sense. This concept refers neither to essence nor to what the body is, but to what it is capable of bearing and doing. In this sense, Deleuze (2008) says that according to Spinoza ‘power’ means: “the actions and passions something is capable of” (p. 75), then there is no general essence, power is unique, and more than quality or amount of power, there is ‘intensity’. It is possible to say that it is precisely that ‘intensity’ of power that is affected by the power diagram in which we are currently involved.

To start, it is important to mention Foucault (1999a) and remember that several decades ago the philosopher warned about what he described as the university’s ‘double function’. On the one hand, the function of ‘exclusion’, which kept students in prison outside society, relegated on the campus where they were transmitted an academic and traditional knowledge away from the needs and problems of the present. They were maintained in an artificial society with mechanisms of hierarchical relationships and various rituals (evaluation, for example), in a kind of fictional society that immersed them to a state of distraction that had nothing to do with real life and built an enclosure where young people were “neutralized by and for society, turning into reliable people, powerless people, castrated, both politically and socially. This is the first function of the university: Putting students out of the world” (Foucault, 1999a, p. 29). To this exclusion function, the philosopher added the ‘integration’ function when students already turned into ‘assimilable’, which could be totally recovered or re-assimilated by the society that could then ‘consume them’.

These Foucauldian analyses offer powerful tools to stimulate thought, allow to identify the characteristics of a moment and locate power diagram, which has been modified over time, as is the case with any power diagram that is characterized by its dynamism and, in addition, it is not identical in different locations. Although these analyses of the philosopher differ with the current university reality, given the time and situational distance, especially because there does not seem to be the dividing line between real society and university life, the idea of thinking about the functions of exclusion and integration that, as explained, involves university life, allows to reflect on the effects on subjectivity that



these functions can cause, although in our temporal and spatial situation they are presented in another diagrammatic expression.

However, what provokes greater interest in the context of this work is what Foucault (1999a) added to the previous considerations:

Insidiously [the student] has received the 'values of this society, has received the desirable models of behavior, the guidelines of ambition, the elements of political behavior, so that this ritual of exclusion ends up taking the form of inclusion and recovery or absorption (p. 30).

Regarding what was expressed by the philosopher, it is possible to think that students are already 'consumed' and 'assimilated' in some way by today's society during their academic years. This 'double function' described above does not consist of two stages that happen sequentially, it is a diachronic process during which students receive everything the professor mentions: values of society, desirable ways of behavior, elements of political behavior and patterns of ambition.

It is possible to observe that the elements mentioned are being installed in the student as a paradoxical freedom which, as referred to Han (2012), would be the 'excess of positivity' that characterizes the 'form' in which power is presented in society.

Therefore, it is necessary to clarify some aspects of the perspective assumed in this paper. First, subjectivity is understood as a 'logopatic' lattice (which articulates logos and pathos) considering that the subject, especially in education, relates the affective and the cognitive in an inextricable way. Hence, the 'power to act' refers to the idea that we are emotional and rational beings, then the reason-passion, affection-intellect, or cognition-feeling dichotomies that somehow derive from mind-body dissociation are rejected. In the framework of this conception emerges the idea that 'work on themselves' articulates the cognitive and affective in an inalienable way, therefore, it can accommodate mental, emotional, sentimental suffering in the elaboration of these transformations.

It is also possible to explain that subjectivity in this work is conceived in the Foucauldian sense. Subjectivity is not a relationship from the individual to the world but a relationship from the knowledge and powers that the individual 'finds' in the world, which, as said by Diaz (2014), produce a fold, "generating zones of subjectivation" (p. 190). It is in this sense that is based the need to problematize the current relationship between the subject and education, especially in view of the fact that there are relations of power in education as the 'microphysics' of power, called by Deleuze (2014) as "molecular conception of power" (p. 58).



In addition to the above, it is necessary to mention the importance of intersubjectivity since subjects are always related in education; therefore, it is alluded to that relational sense, both of the subject in relation to others and of the subject in relation to the world. In this sense, as Deleuze (2014) says, power is also a relationship and the power relationship is a relationship of forces, it is then inferred that they are always present in educational relations.

The senses and effects of the performance imperative combined with power semantics are then deepened, and a perspective is shown on what we consider to be a possibility of transforming the conditions of de-empowerment, that would be found in another form of subjectivation based on an esthetic, which is both an ethical and political position.

Tensions of power and possible subjective transformations as a gesture of vital resistance



a. Between performance and suffering

To clarify the diagrammatic conditions of power, Han (2012) is cited since he argues that the society of the 21st century is no longer disciplinary, but a 'performance society'. It is characterized by the possibility and ability to do something, so projects, initiatives and motivation replace the prohibition and mandate of the disciplinary society governed by 'no', whose negativity generates 'abnormality'. The performance society produces depressive and looser individuals who are no longer 'subjects of obedience' but 'subjects of performance', i.e., 'entrepreneurs of themselves'. Additionally, the performance society would be the result of an improvement in disciplinary societies, the subject of performance would have gone through the disciplinary phase.

With regard to the unhealthiness that can be identified as an effect of this type of society, Han (2012) mentions depression as a representative disease of the present society, which would be caused by the pressure that generates performance, for example, at work. The author refers to the 'occupational wear and tear' that causes exhaustion. The most significant thing is that the author claims that in reality what makes people sick is not the excess of responsibility and initiative, but the 'imperative of performance', as a new mandate of the labor society, which causes progressive social fragmentation and lack of relations.

The current subject of performance is defenseless and unprotected against the excess positivity of power, he explodes himself voluntarily without external coercion, the 'work on himself' that makes him both executioner and victim. So, according to Han (2012) depression occurs when the subject of performance notes that 'can no longer be able to', so for him nothing is possible, in a society that precisely promotes the idea that 'nothing is impossible'. Thus, the 'extra mile' leads to a destruction that can be related to an ethical dimension.

According to Díaz (2014), the subject of ethics is constituted in two parts, one is the 'determination of the ethical substance' and the other is the 'elaboration of ethical work'. The first is the way the individual 'shapes himself', taking into account his belonging to a group, and that way is linked to epic changes. The second is the transformation that the individual does on himself. Both 'parts' relate to the same meaning: The subject constitutes himself, and both the 'form' that is given and the 'ethical work' that he carries out, form agonistic relationships: with himself and with others. This is most certainly true if the subject is considered to be forced to take the 'shape' of the performance, thus shaping and transforming according to the parameters of the power diagram in which is immersed.

Undoubtedly, according to Han (2012) the subject of performance is at war with himself and thus the one who is depressive would represent the 'invalid' of an interiorized war. While it is not the responsibility of the authors of this work to discipline the meaning of the so-called 'depression' for which training in medical sciences would be needed, it is appropriate to affirm that there are moments of concern, frustration, sadness and restlessness that can be interpreted as diverse expressions of a strong sense of 'helplessness', in the face of excessive self-demand to be able to perform more and more; these are states that can be observed in education or at work, as mentioned by the South Korean philosopher. In this regard, a question arises: Does the 'ethical work' that subjects face in a 'performance society' resemble the work that subjects do within educational institutions about themselves?

A provisional affirmative answer can be found, because the aforementioned mood states are presented as "sad passions" in the sense of Spinoza ([1677]2012), affecting the power to act. This is a paradox: The subject seeks to weakly multiply his power to act while wasting, inhibiting or paralyzing it, so that he becomes the 'invalid' in that struggle with himself.

The power that the same subject deteriorates or hurts, that 'power' in a spinozist sense is not power over others, as Tatián (2014) says, but Spinoza refers to an instituting power that is transindividual and capable



of affecting others, and so it is “resistance to powers that requires the helplessness of others for their joy, the alienation of bodies and what bodies can do for their dominion” (p. 54).

Hence, if the subject experiences those ‘super passions’ as he encounters a limit in his own being, a limit that stops him in his career to continue to intensify what he has previously thought as a progressive growth in his performance potential, he becomes a subject dominated by hidden and invisible forces for him, since before being sick, he had been convinced that he was acting freely by pressuring himself to increase his capacity for productivity.

The performance subject shapes himself in a ‘forced freedom’ and elaborates his work on himself as a free obligation to maximize performance. While the subject constitutes himself actively, he does so according to power schemes that are proposed to him and imposed by his culture and society. With regard to education, in case subjects are transforming themselves into the sense of the ‘free’ obligation of performance, this problem should be deepened in order to find interspaces where resistance occurs in the sense of Foucault (2011), through practices of freedom.

Bearing in mind that violence of the new societies seems to be based on the self-exploitation of the subject, being this much more effective than exploitation by others, since it is accompanied by a feeling of freedom so that the operator is the same exploited, this form of ethical-political violence should be ignited. As Han (2012) says, “self-referentiality generates a paradoxical freedom, which, because of the obligation structures immanent to it, becomes as violence” (p. 20).

It is possible to infer that those involved in education can resist to the powers that find it difficult to hold themselves and who provoke ‘pathological’ manifestations in subjects. To do this, imposing performance instead of powering the subject ends up by overriding him by finally turning him as helplessness, as an alert signal. Another question arises in this thought-provoking intention:

In the educational field, will this situation of coincidence of freedom and compulsion expressed in the forced freedom as a free obligation to maximize performance be replicated?

This question cannot be answered in the magma of significance in which the subjects are immersed and of which we would be part as necessary gears for the operation of that subjective self-exploitation machine. However, raising it as a philosophical problem may in some way reveal whether the current educational task involves any of these harmful elements.



As expressed by Maliandi (2010) in the approaches of education, either the adaptation to the customs and prescriptions instituted is sought, or the disconformity with the instituted and the self-sufficient criterion is sought, without which there would be neither creativity nor change possible. Thus, setting a topic to the possibility that this 'performance' with its dire consequences on subjectivity has already become 'custom' or 'instituted way of life', is a possibility condition of a disagreement that provokes resistance and the search for actions capable of introducing changes in this new reality.

Following the lines proposed by Foucault (2011), since there is no society (or education) without power relations, the problem is not to try to dissolve them, but to favor practices in freedom, which have nothing to do with the 'paradoxical freedom' inherent in the imposition of performance.

In the educational field, the protagonist acts as a victim and executioner as can be interpreted, because he punishes himself by believing that he is not aware of that paradox. This is the responsibility of all the protagonists of education, so there is a question: Have professors and students ever thought thoroughly about this problem of paradoxical freedom that is inherent in this society?

b. Senses of semantic power

In order to connect analyses of semantic power with education, it is necessary to explain as Taylor (1996) says, that humans are beings that interpret the world, the others and ourselves, and we do it from meanings and senses given in advance, which we interpret and modify, creating new senses, but always within the framework of our culture and society. From these assessments, the 'semantic power' set out by Han (2016) is addressed, because it is possible to think that it is also part of 'paradoxical freedom' and would be the second constituent element of the current power diagram.

According to Han (2016), something only becomes significant if it is put into a network of relationships, in this way, power can be linked with a 'sense', through its 'semantic potential' that frames it in a world of understanding. The sense arises when the members of a context are part of a 'referential continuity' that refers to each other. Therefore, power will have to create a 'horizon of sense' in order to manage the process of understanding and action efficiently. It is precisely at this point that power differs from violence, which is pure because it is stripped of meaning. As Han (2016) states: "Power is the only thing that allows things to partici-



pate in a sense. From this point of view, power is anything but a silent and absurd compulsion. Power is eloquent” (p. 35).

In this regard, that ‘eloquence’ of power fails to disable the creative power of human linguistics. As Joaqui Robles and Ortiz Granja (2019) say, language not only disqualifies ideas, destroys hopes, and erases or denies realities, but also creates different and creative realities that can cause important changes in the lives of subjects, can build worlds and provoke generative and productive dialogues. In other words, this paper analyzes that ‘semantic power’ in its negative sense, but it is essential to remember that there is a creative and generating ‘positive’ face in the context of human relations through language.

Considering Han (2016), sense is power and the sign reveals as the painful imprint of a will over another, thus the powerful ‘violates the other’, representing the language of signs of the strongest; in the semiotics of power the signs would originally be ‘wounds’.

Regarding ‘wound’, it is worth including an esthetic perspective since wounds exist and will exist, either because of the semiotic power as Han says (2016) or because of a diversity of lived experiences, and as such can be resigned, and included in what the horizon of sense imposed has tried to invisibilize and eliminate from the plane of sense to smooth and to endow negativity, when in reality a wound can be integrated into an ‘other’ subjective form, which may well be part of a ‘esthetic of existence’ embodied in life as a work of art (subject discussed below).

Han (2015) says that the present society increasingly eliminates the negativity of the wound, the natural beauty has stunted in the smooth and polished the digital beauty, without harming or offering resistance. Perception also avoids negativity, but to perceive with the senses is to be exposed to a breach, to a wound. The experience is necessarily part of the negativity of being shocked and snatched away by this experience, in which the subject has to expose himself to the danger of a possible wound.

According to the author, there is no poetry or art without a wound; also, thoughts and ideas are part of it, since it is in pain where the essential otherness of the existence is revealed. It assumes discomfort and uncertainty, but also grants a cracked space that allows regeneration and transformation. This poetic approach to wound holds a semantic potential that could be included in the reflections around education: Is the subject in education smooth and without any injury? How can favorable transformations in education be real if professors do not dare to meet subjects that are not *tabula rasa*, but carry marks and wounds and are



therefore not smooth matter for modeling or recording imposed senses and meanings?

Because of the latter, it is essential to emphasize briefly that what makes us human, in the Levinasian sense, is the questioning of the other, his face, his presence, because it is in that recognition where the narcissistic self-referential is interrupted. As Bárcena and Mèlich (2014) express in this relationship of otherness, it is the possibility of a new 'way of saying', a new and constant re-interpretation. It is an event that breaks all expectations, giving rise to a 'wound' at the very center of identity, and that, no matter how much it tries to heal, there will always be a scar.

The esthetic dimension has been referred to since the subject undergoes transformations on himself, becoming the architect of his being, his work of art. Whatever the way to understand that 'work of art', and here esthetic sensitivity is related with ethical sensitivity and can be partly constituted, in what Mélich (2006) calls a pedagogical 'pathetic' that as such, in addition to transmitting the opening of thought and doing, provokes an opening of feeling, which for the philosopher is to feel the suffering of the other, to which one can add a crucial aspect in the context of the reflections that are exposed in the present work: an opening of feeling self-transformation with full awareness of the vital implications of that subjective transformation.

Returning to the semantics of power with its ability to cause pain, the reception of sign language as Han (2016) refers to as a "sense of suffering in the face of the recognition of a foreign power seeking the conquest of the other" (p. 33); the statements are thorns that are nailed to the other for their mastery to the understanding as a way of obedience.

This idea is highly challenging if it is moved to education, as it provokes and allows to analyze: the teaching effort to achieve understanding could be understood as a 'conquest' if one considers what the philosopher has said. However, it should be recognized that the power of the professor in the asymmetrical pedagogical relationship does not operate in the logic of the colonization of the student, because its work is based on the foundations of education, that they basically propagate to the benefit of the student who learns by understanding and then is included in the cultural aspect as a participating and active member, who upon entering the order of speech acquires the power to transform what he knows.

It is important to recall the Foucauldian sense of the functions of exclusion and integration in the university mentioned at the beginning; the student is integrated into the semantics of power from the beginning of his condition, although it should be noted that there is no 'exclusion'



in the sense expressed by Foucault (1999a), precisely because the power diagram already operates during academic training.

Continuing with Han (2016), the philosopher claims that power creates 'significance', it is not silent and absurd compulsion; at the same time, significance carries features of a 'poetology' of power. Power is 'poetic' because it always begets new forms and, moreover, does not seek an absolute perspective. Though this is a brief mention made of this poetic quality of power, it is a question that worth deepening by its esthetic potential.

Han (2016), when reviewing the Foucauldian work, expresses that disciplinary power penetrates the body, leaving traces and generating an 'automatism of custom'. Thus, the language of power, rather than breach, is intended to be passed on to the subject's corporeal materiality. The positivity and/or productivity of disciplinary power is presented as the genesis of movements, gestures and postures that seek a formalizing effect: 'converting' the subject into a machine by the automatism of habits.

It is possible to interpret that the techniques of the disciplinary society have not been replaced in the current power diagram but they have mutated, and still persist, then it would not be accurate what the South Korean philosopher had said when mentioning that society has 'replaced' the disciplinary society, especially given that, in addition to causing this automatism, the disciplinary power takes over the body by registering it in a semantic network, being essential to emphasize that the traces that both the disciplinary power and the power of performance leave in the body are always significant, because they inhabit the being and their effect is the 'wound', a mark that is a sign.

Using sense signs and configurations, power places subjects in a certain perspective that legitimizes the dominance of a group. Certainly, social sense always contains a dimension of power and dominance that operates symbolically, and strengthens itself by generating perspectives or 'models of interpretation' that legitimize and maintain an order in which society cares that the automatic reactions of the body make sense. According to Han (2012), this works as a 'continuity of sense' that operates, so that the actions are interpreted like this and not otherwise. Then, existence does not unfold in compulsion, but in the automatism of custom, which raises the efficiency of power that relates in the subtlety of the obviousness that functions as a dictatorship of the given sense.

In the educational context, there is always an attempt to share meaning and senses. If agreeing with the postulates of critical pedagogy, professors commit to students in an emancipatory sense. While the main critical categories that guide the teaching practices of some professors



are not developed here, it should be mentioned that critical professors seek to denature the given and fight against diverse forms of oppression. In this sense, the 'subtlety' of obviousness is best understood from Han's contributions and can be considered as a form of oppression, since it functions as a dictatorship of the given sense. In problematizing semantic power in education, it should be considered that education produces subjectivity. As Rodríguez, Betancourt and Barrientos (2019) claim, the symbolic construction of subjectivity is generated in correlation with others, and in many cases it "has the ability to generate some alternative to the institutional forms of power, by building subjectivities that do not necessarily respond to hegemonic norms" (p. 94).

It is essential to point out that education may lead to an introduction in the semantic network mentioned by Han (2016), it may happen that both professors and students enter in a 'model' of significance that is irrelevant to certain 'wounds' caused by semantic power. Precisely because of the way in which this power operates, perhaps the subjects do not notice the new ways in which that power is presented by being immersed in the automatism of custom. While professors seek the well-being of students, perhaps without even suspecting, professors include students in the record of what is 'natural', given the level of 'requirements' of performance that seem harmless. Therefore, a potential 'wound' arises from the encounter and exchange where things are turned to each other, allowing to affect all the simultaneous living experiences. Ideally, Han (2015) states that the salvation of beauty is the salvation of the binding, which means that beauty that is intrinsic in the metaphor of narrative relations causes things and events to engage mutual dialogue, poetizing the world; likewise, the salvation of binding in education can save 'beauty' from the intersubjective relationships that occur in education.

Perhaps professors work and develop in the alluded 'paradoxical freedom', in the 'ethical work' about themselves which, in addition to converting them into obedient machines of the automatism of habits, turns them into stressed, exhausted and self-exploited subjects to perform more. This is especially true in circumstances of virtual classes because of the pandemic, without face-to-face classes that allow for the encounter and development of the teaching task together with others; in this context, there is a loneliness and a forced separation from the others, which have generated melancholy and sadness by difficult circumstances. This melancholy is one of the sad passions already mentioned, the relation between ethics and politics in such circumstances may be better understood by resorting to Tatian (2014), when arguing that melancholy, as a sad passion, is 'antipoli-



tics', and generates helplessness in individuals. Melancholy, as inhibition of the ability to affect (in a spinozist sense), enters into a 'moral of suffering', blocks active life and therefore ethical expansion and political exercise; is a solitary passion for antonomasia, because the body that is affected by it is subtracted from the conformation of the public power by subtracting itself from compositions with the others.

In education, these 'compositions' have been altered by the absence of the usual face-to-face classes. Then, despite experiencing these sad passions (melancholy, feeling of loneliness) the subjects have been forced to perform as much as possible, and it is easy to identify how unhealthy the self-demand is to remain in the society of performance, when depowered bodies have showed that they cannot always 'be able'. This burden of sad passions had not previously been integrated into a 'moral sacrifice' in education, however, those involved have carried out unhealthy subjective transformations by acting 'as' machines and 'with' machines that fulfilled the function of replacing what is irreplaceable: the face-to-face pedagogical encounter with others.

The above is also valid for students, loneliness, sadness, melancholy and nostalgia have marked them in their experiences during this educational journey. Perhaps this is what motivated the conduction of this article. If that is the case, the opportunity to turn over the concerns about the relationship between subject and power in the way it has been observed would be valuable.

It is now appropriate to resign that experience and finish this section by mentioning Foucault (2012), when in an interview, refers to his personal experience with the disease, psychiatric hospitals and death and then he states:

(...) from experience, it is necessary to pave the way for a transformation, a metamorphosis, which is not only individual, but accessible to others; so, this experience must be able to be related, to some extent, to a collective practice and to a way of thinking (p. 16).

Likewise, it is possible to give meaning to the experiences lived by individuals during pandemic, as well as to deepen the meaning to the whole panorama shown in this work around the current power relations. Attempts have been made to 'pave' the way for a metamorphosis that is not only individual but collective, which relates to collective practices and a way of thinking the present that encompasses all.



c. Toward an esthetic of existence as resistance

In the reflections presented, it is not all about denunciation or appeal to the state of alert to the stealth forms of restraint, there are possible transformations and forms of struggle. The Foucauldian work always mentions the possibility of the subject to resist, because the relations of power consist on that (otherwise it would be domination). Resistance can be understood as a policy of the 'esthetics of the existence'.

In education, there is room for self-care and especially for others, since it is its main responsibility, as suggested by philosophers of education like Cullen and Mélich, among others. In the light of self-care, the Foucauldian approach proposes a lifestyle that opens the subject to the possibility of resisting power in the complex social sphere. Foucault (2012) considers that it is possible to invent 'other possibilities' of life, understanding that the main task of our time is to dismantle the construction mechanisms of subjectivities and to carry out a type of action that rejects the subjectivation that has imposed for centuries the Western culture and expresses:

And if I became interested in antiquity it was because of different reasons, the idea of morality as obedience to a code of norms is disappearing, it has already disappeared. To this absence of morality there must be the search for an esthetic of existence (p. 134).

There is no 'absence' of morality today, rather there is customary morality that has become sacrificial, while blending defensively with individualistic hedonistic nuances to resist the 'sacrifice' of itself. In this context, in the face of the new codes of sense, it is appropriate to search again for an esthetic of existence. One of Foucault's key questions (1999b) regarding life as 'work of art' is found in the following fragment:

What surprises me is the fact that art in our society has become something that concerns nothing more than matter, not individuals or life, that art is a specialty made only for experts, by artists. Why could not everyone make their life a work of art? Why can this lamp or house be an art object, but my life cannot? (p. 193).

The French philosopher warns as an indispensable and politically urgent task to consider resistance as the invention of new possibilities of life that contribute to ways of existence that make life an authentic work of art. Therefore, it is essential to focus attention on the subject's relationship with himself, as has been done since the beginning of this work, to make visible what the subjects are doing with what we are today during pandemic.



Today the struggles against forms of restraint persist and should be increasingly important, as they revolve around the question: Who are we? As Foucault (1991) says, the struggles “are a rejection of state, economic, and ideological violence that ignores who we are as individuals, and also a rejection of the scientific or administrative inquiry that determines who we are” (p. 60). In this regard, education must assume responsibility in this fight against current forms of subjection.

Foucault (2001) explores the forms of self-relationship by which the individual is constituted and recognized as a subject. It is a work on himself which in Greek culture consisted of asceticism in function of citizen life, for Hellenists it consisted of asceticism for personal perfection, and for Christians it consisted of a purifying asceticism to save the soul. But beyond these studies, the philosopher proposes an esthetic of existence, an ‘art of living’ that does not consist of replicating the spiritual exercises of antiquity, but allows the subject the possibility of being free, as opposed to the external powers.

The ‘art of existence’ is based on the principle of caring for oneself, Foucault (2001) expresses that this principle is the one that “bases his need, governs his development and organizes his practice” (p. 42) and as has already been said, self-care in education is related with the care of others.

Regarding the moral reflection of antiquity around pleasures, it is oriented neither to the codification of acts nor to hermeneutics of the subject, but to a ‘stylization of existence’. This stylization of existence acts in an open field that does not obey coded and systematized restrictions, according to Foucault (2012):

The idea of *bios* as material for a work of esthetic art is something that fascinates me. Also, the idea that ethics can be a very solid structure of existence, without any relation to the legal *per se*, without an authoritarian system, without a disciplinary structure. All of this is very interesting (p. 59).

The philosophical *ethos* of our present might consist in making our life a work of art, for which it is necessary to constantly criticize the type of rationality that has been imposed on us. Resistance, as an esthetic of existence, is the possibility of exercising freedom, choosing it as a way of being. It is a practice that rejects the regulations imposed in a revolutionary gesture that activates creativity in the field of *ethos*; it is a force of transformation and struggle against the powers that try to control and normalize us; it is the creation of new ways of existence through the rejection of imposed subjectivity. It is about living the creation as a permanent



practice, such as resistance that enables modes of existence that allow to make life, both ethically and esthetically, a field of unprecedented affections and perceptions, giving new ways of looking, knowing, thinking and doing. In short, as Foucault (2012) says: “Since the self is not given to us, I believe there is only one practical consequence: We have to create ourselves as a work of art” (p. 61).

Conclusion

The main conditions that make up the current power diagram have been presented and their relation with the ethical, political and esthetic that form subjectivity.

Therefore, since education is ethical, political, esthetic and also teleological, it has been reflected on the need to be alert to the subjective transformations that educational practices generate, encourage, favor, discourage, make difficult or interrupt.

Being alert to the subjective transformations that current education causes is a challenge for those who are involved in education with emancipatory aspirations.

Considering as ‘unhealthy’ some subjective transformations in the context of the ‘performance society’, means to think that they limit, condition or impede the exercise of the power of acting of the subject.

Foucault (2012) thinks that by having mentioned the forms of repression and limitation that occurred in the past, “people are free to come to their own conclusions, to choose, on the basis of all this, their own existence” (p. 135). In the same sense, this work has attempted to highlight the forms of limitation and repression that work stealthily in the power diagram at present.

In the framework of an apparent freedom of the subject to operate transformations on himself, he can ‘work’ on himself highly influenced by the ‘imperative of performance’, i.e., today the subject ‘in’ education can feel and think that he is exercising his freedom when in reality he does not know the hidden mandates that require him to maximize his productivity, and then he imposes on himself what is actually imposed stealthily on him from the outside. It is expected that it changes, and then all subjects can freely decide their own existence.

Professors are immersed in a complex world of strong and tense human relations where power is always present; hence, it is essential to promote in education a movement that authorizes the deconstructions of



dominant powers, both inside and outside institutions, with the purpose that each subject can defend himself from social pressures by taking the path toward an esthetic of existence in the tireless task to conceive life in and outside education as a work of art.

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EDUCATION DURING COVID FROM THOMAS POPKEWITZ'S SOCIAL EPISTEMOLOGY

La educación en tiempos del COVID desde la epistemología social de Thomas Popkewitz

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Abstract

This article uses social epistemology to interpret Ecuadorian educational activity during the COVID-19. Through this theory / methodology developed by the American academic Thomas Popkewitz, it is sought to understand the educational moment of Ecuadorian education inscribed in the dynamics imposed by the pandemic. The article studies the ways taken by different educational concepts, how they become more acute, more visible, how they lose their subtlety, or how these are confirmed. Two objectives are achieved. On the one hand, to present social epistemology as an interpretative research perspective, not so widespread in our environment. On the other, to study the health event and its influence on education from the theoretical orientations of social epistemology, contrasting its concepts with problem manifestations of education under COVID19. It also interprets information from teachers, authorities and communicators. The changes occurred in schooling, curriculum and pedagogical discourse since the emergence of the pandemic are revealed. They are reflected on the changes occurred when moving from face-to-face education to virtual education and those due to the introduction of new practices, their interrelation with existing structures and their rules. The influences of educational psychology in schooling, curricular organization and pedagogical discourse are also presented. Its links to academic discipline, curriculum and evaluation and its role for achieving the successful adjustment of the individual with his environment.

Keywords

Social epistemology, education, schooling, curriculum, pedagogical discourse, pandemic.

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Resumen

Este artículo interpreta, desde la epistemología social, la actividad educativa ecuatoriana durante la COVID-19. Desde esta teoría/metodología desarrollada por el académico estadounidense Thomas Popkewitz se busca comprender el momento educativo de la educación ecuatoriana, inscrita en la dinámica impuesta por la pandemia. Se estudia cómo se agudizan, se hacen más visibles o pierden su sutileza diversos conceptos educativos, o de qué manera estos se confirman. Se logra, por un lado, presentar la epistemología social como perspectiva interpretativa de investigación, no tan difundida en nuestro medio. Por otro, estudiar desde sus orientaciones teóricas la influencia del evento sanitario en la educación, contrastando conceptos con manifestaciones problemáticas de la educación en pandemia e interpretando la información vertida por docentes, autoridades y comunicadores en medios de comunicación. Se develan los cambios ocurridos en la escolarización, el currículo y el discurso pedagógico al surgir la pandemia. Se reflexiona sobre las alteraciones acaecidas en esos conceptos al mudar de la educación presencial a la educación virtual, así como frente a la introducción de nuevas prácticas y la interrelación de estas con las estructuras existentes y sus reglas. Se presenta la influencia de la psicología educativa en la escolarización, la organización curricular y el discurso pedagógico vinculados a la disciplina, al currículo, la evaluación y encargada de lograr el ajuste exitoso del individuo con su medioambiente.

Palabras clave

Epistemología social, educación, escolarización, currículo, discurso pedagógico, pandemia.

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Introduction

This article interprets from social epistemology the educational activity during the pandemic by COVID-19. Based on this theory/methodology developed by the American academic Thomas Popkewitz, it is sought to understand the educational moment of Ecuadorian education, framed in the dynamics imposed by the pandemic, studying in what way different educational concepts become more acute, more visible and when they lose their subtlety.

Two objectives are achieved. On the one hand, to present social epistemology as an interpretative perspective of research, not so widespread in this environment. On the other hand, to study from the theoretical orientations of this theory/methodology the pandemic and its influence on education, contrasting concepts with problem related to pandemic education. The changes that have occurred in schooling, curriculum and pedagogical discourse since the emergence of the pandemic are presented. It reflects the changes that occur when moving from face-to-face education to virtual education, as a result of the introduction of new practices, their interrelation and the existing structures and their rules.

The influence of educational psychology, schooling, curricular organization and pedagogical discourse, linked to curriculum, academic discipline and evaluation, is also reviewed in order to achieve the successful adjustment of the individual with the environment.

Coronavirus has affected all human activity, and education has not been the exception. Few analyzes and interpretations have been made on Ecuadorian education during COVID-19, from positivism, to discourse linked to production, to sociocritic positions. There are some aspects that have changed in education since the pandemic started. One of them is the sense and practice of education itself, since it moved from face-to-face to virtuality. However, the educational process coped by virtuality goes far beyond coordinating a session in Zoom or any application. It is much more than seeing how students magically appear on the screen to receive the course or the thesis defense. That reality is rather a privilege.

This process is not met by several factors typical of this time, as well as by structural aspects of education present even before the pandemic. Two questions would be answered in this paper. On the one hand, what is social epistemology? And what is its main conceptual basis for interpreting the educational phenomenon? How does social epistemology interpret the changes that have occurred in Ecuadorian education since covid-19 pandemic?

A theoretical research has been carried out from various works developed by Thomas Popkewitz to conduct this article, essentially those that initiate and consolidate his proposal. In addition, information from professors, authorities and communicators of the media is interpreted, and other theoretical and documentary sources are studied that provide data to look at COVID-19 in Ecuadorian education.

The present paper is structured in four sections, the first section deals with the context of Ecuadorian education when COVID-19 appears; the second section presents social epistemology as a theory/methodology of research; the third section interprets from social epistemology the educational phenomenon at the time of COVID-19; in the fourth part the opportunities that this event would provide in Ecuadorian education are looked at and, finally, the conclusions are shown.

The Context of Ecuadorian Education when COVID-19 Appears in Ecuador

The pandemic, as Samuel Guerra emphasizes, illustrate the vulnerability of life established by coloniality in Latin America, a new vulnerability that enlists the region within a sense of universality and not merely as a backyard of the metropolis (Guerra, 2021). COVID-19 also floated the

asymmetries and inequities inherent in the capitalist system by acting in a country called a third world.

Since March 16, 2020, these asymmetries, in the dominant educational modality, have been observed, first of all, in connectivity. According to a newspaper article from El Universo (2019), in 2019, the official speech showed that 79% of Ecuadorians had access to the Internet, particularly from mobile devices. The official spokesmen, in the public newspaper El Telégrafo (2019), for their part, said that the State would develop programs for rural people to access satellite connections at \$9 a month.

When the coronavirus arrived, the figures were different, so as of March 20, 2020, only 37% of households have access to the Internet and only 9.1% of those living in rural areas (INEC, 2019). As Volhonen (2020) points out in his "Recommendations for Education in Times of Emergency", out of 37%, only 24% of Ecuadorians have a computer at home and only 8% in the rural areas. The new way of learning did not begin well, even more so when "(...) the ministry always points to educational innovation through the entry of new objects, (...) electronic whiteboards, computers, tablets, perhaps androids in the future, in disregard of the main element of learning: The educational link" (Miranda & Grijalva, 2020, p. 203). The statistical data presented in the government's political discourse contradicted the real conditions that the country had to face the emergency. This situation exacerbated because, in the pandemic context, the education was the most affected area.

In the virtual education, academic work is hampered by the loss of Internet connection, especially if the provider is the state telecommunications company (CNT). The professor had not thought about it before, nor did he guess that he would have to use his own equipment and resources to teach, as Abad (2020) reflects in his article "Education in the Society of Fatigue".

The aim is to understand the educational dynamics in this new reality, from the social epistemology. To this end, this theoretical orientation and therefore some of its educational concepts are studied.

Social epistemology, theory for educational research

The organizer of social epistemology is Thomas Popkewitz, former president of the Department of Curriculum and Instruction at the University of Wisconsin-Madison, who has dedicated his academic career to studying various phenomena such as educational reform, curriculum, schooling,



among others (University of Wisconsin at Madison, n. d.). Social epistemology, from its most general aspects, has its origins in Durkheim's sociological thought and in the importance provided to the social, the collective and the historical in the formation of communities, as well as having considered that the interpretations made by people of the world correspond to an infinite variety of thoughts and conditions (Popkewitz, 1991).

Another foundation of social epistemology corresponds to philosophical traditions, basically the tradition of French thought, of the theoretical developments of the School of Annals and the *archeologie du savoir* (archeology of knowledge) of Foucault. The Annals School is a historiographic current that began in the late 1920s (1929), and has been influential in the development of social science and historical currents in the 20th century. The size of the Annals School and the journal are so relevant that, according to Barros (1991), "if history has overcome the function of relating the battles and the events of the "great men", it is due to the Annals School, and to historical materialism" (p. 193). The historical tradition of the Annals considers change as a social break in traditional models, rather than looking at it as an evolution or a chronology of events. It looks at history as thought models that interweave with long-term changes in production and reproduction patterns.

The *archeology of knowledge* developed by Michel Foucault is considered by many to be a method for analyzing discursive formations or groups of linguistic systems, which give rise to the thought of the determined historical period in which these were developed; even if the language itself is a timeless basic structure, typical of all discursive formations. Thus, discursive formations influence subjects, while organizing a system of conceptual possibilities that determine thinking in a given place and period. According to Gary Gutting (1994), in the *Archeology of Knowledge*, Foucault tries to build a general approach to the history of thought that does not presuppose the centrality of the phenomenological subject. Foucault, from history, explores the structural relationships that are part of social life and at the same time of the individual's particular conceptions, guiding him to self-regulation. However, it is from the *Archeology of Knowledge* that Michel Foucault (1969, 1991) says what the processes of subjectivation and objectification are, which allow the subject to be an object of knowledge. Even if he does not consider himself, "neither historian of science, nor of ideas" (Burgelin, 1967, p. 845).

The *archeology of knowledge* shares several ideas with the Annals tradition, including the visualization of changes as ruptures. They differ in the *locus* of their research, since in the work of the philosopher the



dimension of this visualization is regional, focused on particular spaces such as prisons, shelters or nursing houses and that of historiographers, in turn, is global and intercontinental (Popkewitz, 1991). Some premises that come from both the Annals and from the Foucauldian reconstruction are important for the understanding of social epistemology applied to the education worked by Popkewitz,

On the one hand, the thesis of Michel Foucault quoted by Burge-
lin (1967) in his article *L' archeologie du savoir* is crucial for understand-
ing the social epistemology: "In a culture and at a given time, there is
only one episteme, which defines the conditions for the possibility of all
knowledge" (p. 854). Likewise, from the tradition of the Annals, espe-
cially the so-called third parties, the "approach of history from the sub-
ject, overcoming the deterministic vulgate" is also worked, (Barros Gui-
meráns, 1995, p. 79), an approach that increases over the historians and
social scientists of the time.

In the approach of social epistemology applied to research in edu-
cation, both contributions can be seen more precisely. On the one hand,
the inclusion of the 'power' category in the socio-historical analysis allows
to unravel conceptions of progress that have been maintained as func-
tions of contemporary schooling. For its part, the approach developed
by the Annals allows to enter into a form of thought about the historical
phenomena of schooling, seen as a set of epistemologies that intersect
under certain material conditions (Popkewitz, 1991).

To be sure, from a historical perspective, it is important to unravel
social and educational phenomena, but this is not enough if other concep-
tualizations related to knowledge and which go beyond the interests of
its 'interests', as stated by Habermas in 1970, are not taken into account.
It is changing social conditions and institutional character that determine
epistemological debates. One factor that cannot be absent is the conception
of power and the disciplinary struggles (Popkewitz, 1997), which refers to
the Foucauldian perspective and the studies of micro and macro models of
government developed by the author of the *archeology of knowledge*, who
provide a way of introducing the notion of the State into schooling, from
the particular interest in social models operating in institutions.

This work also allows to consider school pedagogy from a histori-
cal perspective of change in epistemological terms. This historical per-
spective linked to an episteme that defines the possibilities of knowledge
also allows to interpret educational and pedagogical phenomena such as
the school massification, a proposal nuanced in different eras; the styles
of pedagogy, basically those developed in the nineteenth century; and



even the proposals for educational reform and curricular reformulations that occurred in the twentieth century (Popkewitz, 1991).

From these theoretical foundations, it is possible to speak of social epistemology as a method for studying reasoning systems as social practices (Popkewitz, 1997) that “allow understanding how distinctions or differences in schooling build a normative whose effects are governing systems of inclusion and exclusion” (Popkewitz, 1997a, p. 134) in educational policy, research in education, pedagogy and teacher training (Popkewitz, 1991, 1997, 1997a), and at the same time, from the relationships between knowledge and power. It is a theoretical potential for the interpretation of historical and sociological changes in education, forming contemporary schooling practices (Popkewitz, 1991).

Social epistemology takes up constituted objects, such as knowledge linked to schooling and defines them as elements of institutional practice, historically formed from patterns of power relations, which provide structure and coherence to the daily life events (Popkewitz, 1991). For example, if such changing concepts such as reform, professionalization or the Education Sciences are seen as components of a context that encompasses them, these acquire a meaning within a context of relationships that are combined (Popkewitz, 1991). It is a study of educational phenomena, immersed in a knowledge-power relationship, and the ways in which the former interweaves with the institutional worlds to produce power relations. This understanding of the exercise in the education system and the school institution contributes to the visibility of inequities that may appear even in a subtle or standardized way. It is therefore an important contribution to building more democratic societies and schools (Popkewitz, 1997).



The interpretation of education from social epistemology during COVID-19

The change in the educational dynamics produced by COVID-19 is interpreted in this work from social epistemology as theoretical construction. To this end, theoretical orientations will be developed in different educational concepts, defined by social epistemology with educational phenomena of these days, from manifestations that emerged in the new pandemic reality. Reality from these concepts is observed in its distortions, within its limits and it even cracks not as subtle forms of exercise of power but in all its verticality. Looking at all the concepts that study

the various problem manifestations of this “new reality,” they definitely transcend an academic article. This research focuses on three crucial concepts, both in social epistemology, as well as in the study of education and the school institution and its role in *technologies*.

Schooling

Popkewitz (1997) defines schooling as the strategies and technologies that drive students' reasoning about the world and about themselves enrolled in this world. The languages of schooling, he says, are not just words, but rules and standards where discourses are social practices (Popkewitz, 1997a). In this sense, according to Rose (in Popkewitz, 1997b):

(...) the idea of the school was to act as a moral technology, not merely teaching obedience, but seeking to form the personality of the child from the emulation of the teacher's personality (with) pastoral techniques to encourage self-knowledge, to extend the sense of sympathetic identification through the establishment of links between virtue, honesty, self-empowerment and purified pleasure (p. 6).

Certainly, during pandemic, the instructions given to students about how to reason about the world and how they were inserted into it, without losing their reproductive essence, ceased to present themselves as they have been now. Reality, media information, family experiences, and school discourse allow students visualize themselves from their fragility and insecurity, contradicting positivist thinking from the official agenda. The fact that they are unable to attend school change the rules, disciplinary rules, codes of communication and rituals, and face-to-face classes weakened as the educational process developed in virtuality. In this new modality, it is not possible to exercise a strict control or to discipline online twenty students, for example, who listen their class without sharing the same space.

The social patterns of schooling are not neutral, but they correspond to the great social and cultural differences of societies (Popkewitz, 1988) and this is evident during pandemic. Abruptly, coronavirus divided societies into one where students could continue their classes, and on the other, those who did not have that opportunity. In one reality, people at home with cell phones, high-speed internet and computers for all members to work or study virtually. On the other, rural students and their parents, walking for hours looking for connection to be able to listen to class, or who do not have Internet service. A Guano teacher says: “My students do not have access to the Internet frequently. At most... they pay



\$3 to have internet on their phone... they do not have money or parents are the ones who have cell phones, but old ones” (Karen Lopez in *El Universo*, 2020). Thus, inequity in access is compounded by additional costs that further undermine the impoverished economy. Costs in education that should be solved by the State, from the conception of free education.

Another testimony, collected by the Spanish newspaper *El País* (2020) is even more dramatic:

Anita Gualichico, a mother of three students had to buy a smartphone (...) to download the applications that teachers asked for. It was \$300 that she managed to pay in installments (and) plus one or two dollars for daily recharges.

The change in educational modality did not have a fast response from the State to address it accurately. Anita’s testimony predates the educational platform implemented, as she mentions applications requested by teachers and from their initiative.

The minimal connectivity, that defective connectivity that before coronavirus did not allow to run a film, and which, during confinement, with two parents working virtually and with the students in classes, produces interruptions to all. Because, the use of technology, besides being determined by the view of the person who uses it and assesses it (Aguilar, 2011); as Popkewitz emphasizes (1997): shows that “there is a continuous interaction between the social world in which schooling is a part and the dynamics and priorities of schooling conditions” (p. 230) and this interaction between schooling and the social world shows the exclusion of vast sectors when the gear of the system is minimally changed. According to *El Universo* (2020c), the Minister of Telecommunications (Andrés Michelena said that (...) there are three million of students in school and tax schools enrolled in 150 000 schools, of which two million (use) educational platforms and have connection; but one million of students (do not) have a computer or telephone; (...) neither internet at home, nor on their mobile phones.

COVID-19 revealed that Ecuadorian schools do not meet the minimum conditions to develop their education online:

The instruction provided by the Ministry of Education to teachers was to use a platform called TEAM, but there was no prior training. Susana Ponce, 39, a teacher at a public school in Tulcán... did like many teachers: create WhatsApp groups to communicate with parents and send them homework (*El País*, 2020).

In the face of official ineffectiveness, the individual initiative arises which is linked to mysticism in the fulfillment of duty. COVID-19 exposed those weaknesses of the educational system: the control exercised over teachers and their work activity from supervision and local authorities, which was before subtly regulated from visits and communications and that, since the beginning of COVID-19, materialized in strict mechanisms for the teacher to prove that, even from his home, he is working (Oviedo, 2020).

(...) the ministry forces us to enter the platform as assistance and we must send tasks and activities, but I have no content. I have reported this to the school authorities. (...) But the platform is so slow that just by entering to see the activities the students run out of mega (Karen López in *El Universo*, 2020).

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On May 4, 2020, the Costa regime's primary and secondary schools began the school year online, and yet many parents in that region have decided not to enroll their children, both because they do not rely on the new virtual modality, or they lack of resources given economic depression or because they consider that with YouTube tutorials, they could teach their children, i.e., a sort of homeschooling (Oviedo, 2020a). In fact, these rituals and ceremonies of schooling that create a homogeneity illusion were revealed during pandemic. Not only from social differences, but also "social transactions in school that represent differences between what is taught and learned" (Popkewitz 1988, p. 26). A curricular proposal is taught, but it is learned by those who can access to it

The pandemic also highlighted the different forms of schooling, designed according to who the educational proposal is aimed at. Faced with the face-to-face impossibility and the crisis of virtual education in most sectors of the country, the Ministry of Education organized educational days on radio and television:

From March 23, the transmission for radio and television would be from 30 minutes to an hour (...) In the Sierra and Amazonia regime there are approximately two million students. 73.5% correspond to public schools (El Universo, 2020b).

A measure that has also become ineffective by showing that only 8% of rural households have access to these means (Volhonen, 2020). Once again, teachers are providing solutions, teacher Claudia Tobar proposes to search for other effective communication channels: "Perhaps a phone call from the teacher to the father and ask him to talk to all par-

ents to keep them up with what the boys should do” (Claudia Tobar in *El Universo*, 2020). In all situations, teachers are the ones who use their resources for developing their work.

Activities for student were proposed and parents were encouraged to support this modality, despite the fact that, as stated by the USFQ career director of Education: “Traditional education will not work, thousands of repetitive activities can be asked to do, but that will not allow us to achieve the cognitive complexity objectives we would like to achieve. We must try to give them more real and practical tasks” (Nascira Ramia in *El Universo*, 2020). On the one hand, the system allows that the learning is exclusively focused in the text, with its informative content, supporting the activities carried out, without reflecting on the discussion, the debate between the disciples or the research enrichment that invites new developments presented by the professor. On the other hand, a structural problem is not taken into account: there are areas where there is not Internet or radio, with lot of people who do not read on a daily basis. In many cases, the parents who are responsible of their children’s educational process are functionally illiterate.

It was observed that the schools also organize their spaces in a particular way, whether they belong to an ethnic minority or a poor group (Popkewitz, 1997) and also different forms of schooling emphasize different ways of considering ideas, an emphasis that depends on the group of students, whether they are poor or rich, urban or rural, and thus to what extent different social values are looked at and different forms of legitimization and forms of social control (Popkewitz, 1988). Thus, there are different forms of teaching and knowledge is emphasized from the place the student has in society and the usefulness that is believed to be given in accordance with the social class to which he belongs. From these assessments, Popkewitz (1997a) concludes that systems of reasoning are seen as effects of power, which refers to looking at another concept and its manifestations during pandemic.

The curriculum

The curriculum is definitely one of the most important concepts of education and the educational institution. There are different conceptualizations of the curriculum which are viewed from different perspectives. This concept can be seen from a technical nature or from its socio-historical approach, and is also considered as a system consisting of objectives, methodology, resources and evaluation (Oviedo, 2013). To be sure, this

concept must be viewed from a perspective that goes beyond pragmatics, since its systemic organization involves power speeches, and power relations are the ones that are highlighted in its implementation.

From social epistemology, the curriculum is seen as a practice of social regulation revealed as an effect of power. It is a problem of power, produced through the generation of rules and standards of truth, being also a particular historically formed knowledge that inscribes those rules and standards in shaping the ways from which it is based upon the world and upon ourselves, as productive beings of that world. From the context of this study, one important feature, which is particularly highlighted is: the curriculum as a disciplinary technology, which directs the individual to act, feel and see the world in a certain way, disciplining their actions (Popkewitz, 1997a) and shaping the senses of their future actions.

These characteristics of the curriculum from social epistemology are revealed in various situations of educational exercise during COVID-19. In the initial months, the curricular organization was shown as the result of power speeches, not only because the online modality forced the emphasis on discipline mechanisms for teachers and students, but with this exercise of power relationships, speeches, rules, and standards of truth emerged from the most diverse forms. In addition, the move to virtual classes meant that teachers were enrolled in self-regulation processes that meant spending more hours of the day on work activity.

(...) Teachers... should be available in working hours because it is teleworking... they should have their students' phones, emails and answer queries. High school students from Sierra and Amazonia have a parallel online course (Minister Creamer in *El Universo*, 2020a).

This assertion has at least two implications, on the one hand, the ministerial guideline for teachers to respond to questions of their students, and although it emphasizes: in working hours, this is not real, since virtuality is asynchronous. Thus, the teacher depends on when the students want to ask. In many cases, as Professor Karina López says, the availability of her peasant students is at night (*El Universo*, 2020). On the other hand, the minister talks about teleworking and is not the most appropriate term, since this implies that the employer gives the employee the resources used at work. This is not the case, since the teacher uses his Internet, his computer, his electrical energy, etc. However, this self-regulatory principle could not be effectively transmitted to the students. By not sharing physical space, they lack of traditional forms of disciplining, even though the great self-discipline and self-regulation schemes of see-



ing themselves as members of a community/society (Popkewitz, 1997a) that face COVID-19 will not be disrupted.

The curriculum was also highlighted as a particular knowledge organization from which content was emphasized to maintain a pattern of reasoning that guides the actions of the educational community from certain rules (Popkewitz, 1997a). Indeed, the new educational modality imposed by COVID-19 certainly sets aside the discipline of certain actions, by favoring the transmission of knowledge as closely as possible to the planned curriculum, but at the same time privileging topics suitable to the official discourse of security, of control, of stoicism... with which the curriculum used knowledge as a problem of social regulation (Popkewitz, 1997a). This management could not be maintained, as the nature of the pandemic, attacking on different areas such as the economic structure of the country, the subsistence of the same school institution and the axis of the educational activity, made the entire curricular structure go down, both in the fulfillment of the learning objectives as originally conceived, and the methodology, content and skills.

The curricular structure of Ecuadorian basic education makes it difficult to fulfill the entire curriculum program initially conceived. The health emergency and the compulsory transition from the classroom to the virtual educational modality made evident several characteristics of the national curriculum, such as its rigidity. COVID-19 weakened the power rituals of a curricular proposal that even in times of *normality* did not allow the exercise of curricular diversification in practice, but above all in the fact that its main senses cannot be fulfilled in lesser times.

Virtuality cannot be taught 6 hours in a row. Neither teachers nor students can bear all that time in front of a computer. It was therefore necessary, from improvisation, to prioritize the content to be studied and the skills to be developed. If access to virtual education has already revealed the country's inequities as a structural problem, it was found that the virtual modality was effective for the lower grades and it guarantees more or less adequate training processes, which does not occur in the higher grades, because, in the latter, the complexity of the contents and the need for more personalized accompaniment, causes not to achieve adequate results (Oviedo, 2020).

In general, because of COVID-19 governing body of education had to review the curriculum and to prioritize aspects of the curriculum "that should be taught" by the emergency, without considering the voices of the students. A prioritization that, however, was based in "... debates in the curriculum about what is taught to children (which) are debates

about how we perceive us to be, and how we will present that identity, including what remains as a difference” (Pinar in Popkewitz 1997, p.10). Online classes, due to the pandemic, also means isolation, causing demotivation of both students and teachers. This made it a question of mainstreaming recreation into the virtual educational process, also from an emergency improvisation. However, this transversality led to a relationship that undermined the hierarchical relationships, making them in some cases more horizontal.

As the pandemic progresses, it is also revealed that what matters is not the curricular content to be learned, but above all, the transmission of the educational proposal that reproduces hegemony, underlining the content that must be taught in accordance with the social and economic characteristics of the student. From the prioritization of content, it was considered to highlight those that could be “more useful” for that student who sees himself as a farmer in the future or that student who sees himself as an urban professional. From that perspective, the curriculum also functions as a way to shape an imaginary future of the current student from the more or less approximations that the teacher, the director or the same authorities of the Ministry of Education can have. Hultqvist (1997) reveals a somewhat discouraging truth: “The history of the curriculum in this context can be seen as the history of technologies that transform political rationalities into pedagogies” (Hultqvist in Popkewitz, 1997, p. 22). It is therefore important to look at pedagogies also from their function of technologies and from the character of political rationality, to look at them as power speeches.

The speeches of pedagogy

Pedagogy can also be conceived “as the intention of governing the provisions, sensitivities and alerts of the ‘new’ citizen” (Popkewitz, 1997, p. 22). This new citizen in turn is formed from particular conceptions that are managed since the discursive changes in pedagogical practices, which influence the changes on how to conceive the labor processes. Changes in assumptions about the State and the individual, from cultural spaces, are also related as changes of pedagogy (Popkewitz, 1991).

It can also be seen from a technical conception from which learning is divided into parts. This division has its origin in the Cartesian and Rationalist conceptions that reflect knowledge, since the pedagogical exercise implies social assumptions and implications (Popkewitz, 1988).



From the studies carried out in the classroom, it can be said that pedagogical speeches “do not function as an abstract set of ideas to be transposed into and within mental consciousness” (Luke in Popkewitz, 1997a, p. 144), but as a series of processes that inscribe subjectivity attributes in the social body. As part of pedagogical speeches, there are also ways of literacy models, which in schooling show themselves as ‘particular postures. Thus, for example, the correct way to keep the body when reading, silence, gestures, and signs of “being studying” that involve particular codes, which in turn denote ways of acting, seeing, speaking, and feeling of the student (Popkewitz, 1997). These ways are assumed from disciplining forms that indicate right and wrong, along with discursive practices that determine a specific regime of schooling, “a regime of remembering and forgetting, of assuming standardized identities through discursive practices and through unpredictable fun” (Fendler in Popkewitz, 1997, p. 23), but not only ways of learning and schooling regimes indicate pedagogical speeches and thus the production of a certain type of individuals. An important role in this production is the curriculum, knowledge forms and teaching didactics. It is in this transmission of knowledge and even in science itself and its microprocesses that it is evident. Those “microprocesses to produce individuals who are self-moving, self-responsible and ‘reasonable people’” (Popkewitz, 1997, p. 22).

To achieve these objectives, psychology is needed, which is neither a mental discipline nor a research science (O’Donnell in Popkewitz, 1988). If pedagogy is in charge of the teaching processes, psychology is in charge of assuming the learning processes and thus, especially in the field of education, was constituted as the intellectual base and scientific legitimizer of utilitarian activities (O’Donnell in Popkewitz, November 1988). From its role as a scientific legitimizer, psychology became important and was introduced into mass education:

As a technology for the restructuring of how individuals should be viewed, defined and evaluated (...) the various psychologies provided technologies for organizing classroom didactics, instructional materials, and school hours, topics around which children should ‘learn’ (O’Donnell in Popkewitz, 1988, p. 237).

But also, the speeches of pedagogy are used and are influenced by the theories of organization and learning that mark their own institutional styles. Thus, together with school rituals, the ultimate objective is “to project the image of a modern institution that is efficient and rational” (Popkewitz, 1988, p. 234).

The scope of pedagogical speeches goes beyond the educational institution, and it uses processes that function as social technologies and that can be both local and global. From the innovations developed in the educational institution in a particular way, to trends of educational or curricular reform of a global character, as the curricular reforms of the 20th century in general that sought for students to understand who they are and their role in a society (Popkewitz, 1997a), or the neoliberal reforms of the 90s seeking that teachers, students and parents internalize the economic and managerial discourse (Torres, 2012).

Pedagogical speeches as social technology of the educational proposal also came into crisis with the pandemic. This questioning emerged from the difficulties of the online pedagogical proposal at the beginning of the health crisis, especially in the public sector. In the first few months under the new educational modality, the main concern of the Ministry of Education was for teachers to check their work, to fill out forms that demonstrate their virtual educational activity. In other words, pedagogical practice was revealed in two ways as an exercise of power. On the one hand, by making visible the subtle forms of control that in *normal* days (Pre COVID) were administrative reports that had to be filled, a bureaucratic requirement that reduced time to classroom activity. Now, these are represented by control devices that show the punitive character.

The starting point of the crisis of educational speeches was not only the little training of teachers for this new modality, but the little training in pedagogical innovations in a general way; all this leading to poor learning results. The lack of knowledge to choose activities conducive to this modality, for the proper recreation of the curriculum and even to evaluate, predict results that are not satisfactory (Oviedo, 2020).

The structure of the educational system and its institutionality bet that the curriculum in exercise should be kept from the family. This revealed that, regardless of urban or rural reality, parents cannot be the only one or the most appropriate support for the presentation and conduction of content, particularly in higher courses. Are all parents trained to solve a differential calculation problem? Certainly, very few are. The role of the teacher has been revalued (as have the role of doctors and nurses), at least for the time being. Ecuadorian society sees that it is not easy to educate, and parents value the long days in which children and young people are not with parents, activities that were little valued by society, before the pandemic. However, this momentary revaluation of the teacher is not the only positive element. A change, despite being forced, is always an opportunity.



Opportunities offered by COVID-19 to Ecuadorian Education

In July 2020, 1 927 000 primary and secondary students from Sierra and Amazonia (El Universo, 2020) finished their school year and studied their last three months at home. March 13, 2020, was the last day of school for others. On May 4, the Costa regime started classes online and many students from the previous academic year did not enroll. According to Education Minister Montserrat Creamer in *El Comercio*, 2020, the budget reduction for education is approximately \$894 million (El Comercio, 2020).

In this context, there are the concerns of Popkewitz (1997a): “Should schooling concern itself with the nature of training? Should the curriculum produce a more socially efficient worker and citizen? Should we think about enabling children to develop more effectively?” (p. 143).

The answers to these questions are relevant, as they invite changes that go beyond the pandemic and generate qualitative changes as returning to *normality*. If, on the one hand, the pandemic has modified educational activity, making it difficult to conduct it, on the other, if looking at it, it is an opportunity for the various social sectors to look at education from a strategic perspective. This means transcending the two or three years in which coronavirus will accompany the world and rather directing the lines of action for long-term horizons.

The strategic aspect of education considers a deep research as its starting point. It is necessary to know theories and recreate them on agreements to our needs. If scientific research in our country, in general, is low, research in education is even more so. In fact, Suppes’ assertion invites state officials, academics, and others to think seriously about this topic.

It is common to think and say that what is most needed in education is wisdom and a broad understanding of the issues that confront us. In no way. What we need are deeply structured theories in education that drastically reduce and eliminate the need for wisdom (Suppes in Popkewitz, 1984, p. 1).

From this premise and following the order of the three concepts focused on this research, one can first reflect on rethinking education and the educational institution by looking beyond its informational and reproductive orientation, underlining the formative approach linked to critical contextualization, cosmovision and vision of the future of students and communities. Learning is linked to movement and personal contact to maieutical action; therefore, a new schooling is needed that



would care about training beyond axiology, without considering the response to the needs of the company and the selection of labor as its ultimate aim or exclusively training for work. This time shows the impossibility of traditionally conceived schooling, which has encouraged the search for creative learning mechanisms, consciously or unconsciously, taking into account that all learning discourse and organizational procedures are intimately linked to demands, expectations and emotions (Popkewitz, 1988).

It should be thought whether school practice should continue to overestimate the forms of discipline and the discourse signed by efficiency, since both looked at in their exercise toward students. "The school must look at the reconstruction of society from the empowerment of its students to develop a more critical understanding of institutions and social issues" (Popkewitz, 1997a, p. 143), but it must also be guided to their teachers.

These months of health emergency have shown the need to review the curriculum not only in its organization (which for many may seem untouchable), but above all in its curricular diversification and local demands. The needs generated by the emergency strengthened this type of curricular recreation by boosting learning communities on public and private campuses; important associations linked to education and school that did not occur before the pandemic. These processes must continue in the days after the emergency and must be thought, deeply, if lots of assignments should be continue, since it is bureaucratic for the teacher and the student. It must be thought if the masterclass continues to be privileged and if discipline really matters too much. Non-classroom education does not have a rigid curriculum, which in turn responds to power rituals typical of a style of schooling, which are not effective online (Oviedo, 2020). It is necessary for the school to discuss the social structure from power relations, for children and young people to know the senses of their reproductive and liberating character. And there is much to do with the curriculum and its construction, which, as referred by Professor Popkewitz (1997a) it must link "our ways of speaking and reasoning in school and — the ways in which we "say the truth" about ourselves and others— with the issues of power and regulation" (p. 9).

COVID-19 invites processes of discussion among all sectors to re-evaluate the teaching profession. Families understood that during this time parents could not become teachers, and although parents wanted to help their kids to access the information sent by the professor (teacher Claudia Tobar in *El Universo*, 2020), this was not effective in all cases.



Umberto Eco (2007) reminds us that the role of the teacher has already changed before the Internet. That role of knowledge holder, ceased to be its main feature, since now that role is held by any search engine, such as Google. The role of the teacher, in the age of the Internet, showed his characteristics as mediator, facilitator and coach of learning. The person in charge of helping to discern the information offered by the Internet, the motivator for students to link to learning chains, self-learning and research. The teacher is the one who allows constant dialogue, confrontation of opinions and discussion between what comes from outside and what is in school (Eco, 2007).

From these assumptions: is it better for the teacher to fill out dozens of administrative forms that show evaluation and control, or to plan carefully and teach his class from meaningful learning? The reality, which always ultimately determines developments, shows a preference for planning and conduction of the plan.

COVID-19 also brought the attention of the Governing Ministry to something now urgent, but always important: technical assistance. The Ministry created “pedagogical plans for each day, subject, level... readings... tasks and activities that must be done. These tasks are not graded. Students do them, keep them, and when we return to face-to-face classes, they will present them” (Minister Creamer in El Universo 2020a). Continuing this initiative, an institutional and social process for teacher qualifications should be directed. Training that must be directed not only in software or online didactic mechanisms, but to integral formative processes and in an institutional reorganization that allow to revalue the teaching career.

If there are no technical possibilities to conduct online education in rural education, this is the opportunity to generate processes of local participation in learning, in the diversification of the curriculum, in the relevance..., from an honest dialogue, yielding power, as Bakhtin mentioned (1981). Without fear of political discussion in all spaces “some educational programs are based on political theories to encourage participation”, and assigning this topic in the curricular organization means accepting a series of assumptions about the world that are not postulated or codified” (Popkewitz, 1984, p. 15).

In view of the structural impossibility that rurality is virtually educated, the ministry should rather support, with all its technical and economic resources, the local communities to generate their own educational proposals, those that the inhabitants consider appropriate to their reality, transcending developmentalism and paternalism. There is

the advantage of having organized people and nationalities, because it is with them, with the second-degree organizations that the education they want can be built. In the days leading up to the Correism (2007-2017), it was demonstrated how these interactions between the State and the organizations worked properly in indigenous and peasant communities, for example, in school-based schools, with cultural relevance.

This normative element (LOEI) called 'interculturality' should be taken seriously and *diversity* should be looked at without suspicion. This is a crucial task for society as a whole and also involves rethinking the curriculum project, starting from a study that allows to understand how the *other* has been excluded in their reasoning systems and inclusion categories, leaving only the meaning of the different, defined as the one who is not perceived and classified as *normal* (Popkewitz, 1997, p. 26).

It is in this period that developmentalist speeches must transcend. As Popkewitz (1998) once again said, quoting Freire and Vigotsky: "A constructive vision of knowledge can be emphasized if it arises from community participation" (Popkewitz, p. 224). This unwelcome presence of COVID-19 can be used to give us the opportunity to make changes in the sense of Ecuadorian education, to overcome this homogenizing and disciplining educational proposal that have limited for decades the development of children, youth, teachers and parents in our country.

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Conclusions

Not being able to go to school and socialize questions the meaning of education in the school. It is even necessary, given the circumstances, to think about something to replace it. COVID-19 may be the beginning of the end of that institution.

The school operates according to rules and procedures that give coherence and meaning to daily activities, above all, from interaction. Schooling must then be rethought, because this is an institutional agreement, where certain forms of knowledge are emphasized and others are intentionally omitted. True agreements must then be generated to give meaning to discussions about what to learn, what sociocultural values to teach; even more so if students cannot be in front of a screen 6 hours, for 5 days a week. If the day-to-day changes, if the interaction is reduced, schooling must be structurally reformed.

From a long-term perspective, we must look at the various pedagogical processes, the schooling processes, the curricular developments

and, above all, the power relations to which COVID-19 forced to adapt. This crisis allows education to be rethought, beyond adaptations to a non-face context.

Solutions are also needed for immediate problems, such as immediately conducting training days in virtual education, reorganizing learning schedules, reflecting on the mix of face-to-face, virtual, and distance learning. The intention is to keep in mind that there is no learning without understanding. The lack of concept understanding, process knowledge or heuristics for problem solving have occurred before COVID-19.

Consideration should be given to the overevaluation of the role of educational psychology in the curricular organization that is traditionally linked to academic discipline, curriculum and evaluation and responsible of achieving the successful relation of the individual with the environment.

Change does not come from the evolutionary progression of events or people's efforts to influence those events. Change is disturbing and consists in breaking into our forms of reasoning and identities, which hide power relations (Butler in Popkewitz, 1991). COVID-19 obliges change and any process of change must bear in mind the introduction of new practices and their interrelationship with existing structures and their rules, to challenge, modify or legitimize the agreements reached.

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ONTOLOGICAL FOUNDATION OF THE VIRTUAL WORLD FROM THE PHILOSOPHY OF NICOLAÏ HARTMANN

Fundamentación ontológica del mundo virtual a partir de la filosofía de Nicolai Hartmann

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Abstract

The following article presents a philosophical investigation into the ontological shaping of the virtual world. It is a theoretical contribution to the contemporary debate in the philosophy of computation on the ontological characterization of digital computing and its emerging products, as it proposes an approach to this field of study from the philosophical perspective of Nicolai Hartmann. The main objective of this article is to explain the stratification of the virtual world based on Hartmann's ontological theory of strata and categories. To achieve this goal, a critical review of the state of the art of the philosophical ontology of virtuality was carried out. Then we proceeded to present a stratification and categorization proposal called 'The virtual world factory' which is a hermeneutic ontology of digital virtuality based on Hartmann's postulates. The main conclusions reached are: i) The emergence of virtual world reality is constituted of the same strata that make up the sphere of real-world knowledge: material, organic, psychic and social. ii) Virtual reality is a product of computation that occurs in the sphere of knowledge in which there is intervention of the ideal sphere and the sphere of the real world.

Keywords

Philosophy, hermeneutics, ontology, Nicolai Hartmann, virtual reality, digital technology.

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Resumen

En el siguiente artículo se presenta una investigación filosófica acerca de la conformación ontológica del mundo virtual. Esta es un aporte teórico al debate contemporáneo de la filosofía de la computación sobre la caracterización ontológica de la computación digital y sus productos emergentes, ya que se propone una aproximación a este campo de estudio desde la perspectiva filosófica de Nicolai Hartmann. El objetivo principal del presente artículo es explicar la estratificación del mundo virtual a partir de la teoría ontológica de estratos y categorías de Hartmann. Para cumplir con este objetivo se procedió a una revisión crítica del estado de la cuestión de la ontología filosófica de la virtualidad. Luego se procedió a presentar una propuesta de estratificación y categorización denominada 'La fábrica del mundo virtual' que es una ontología hermenéutica de la virtualidad digital basada en los postulados de Hartmann. Las principales conclusiones alcanzadas son: i) La emergencia de la realidad del mundo virtual se encuentra constituida de los mismos estratos que conforman la esfera del conocimiento del mundo real: material, orgánico, psíquico y social. ii) La realidad virtual es un producto de la computación que ocurre en la esfera del conocimiento en el que existe intervención de la esfera ideal y de la esfera del mundo real.

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Palabras clave

Filosofía, ontología, hermenéutica, Nicolai Hartmann, realidad virtual, tecnología digital.

Introduction

The philosophical inquiry presented below is intended to answer some ontological questions about the new horizon of human life that has emerged from digital computing technologies. These are questions like what is a digital object? or what is the virtual world? The initial hypothesis or idea is that the creation of the artificial reality of the virtual world is a projection of the human spirit and, therefore is made up of the same strata that make up knowledge of the real world: material, organic, psychic and social.

The method used to develop this analysis is hermeneutical ontology, which allows to characterize the strata and categories that constitute what is called the 'factory of the virtual world'. The choice of this philosophical perspective is based on the assumption that there is an intervention in digital virtuality of the ideal and the real world, as in the ontological model of the real-world factory formulated by Hartmann, from whose structures it is possible to grasp the principles, substrate and relationships of the virtual world.

The first part of this paper presents a brief characterization of the current debate on the philosophical ontology of computing and a justification of the contribution sought to this debate following Hartmann's ontological theory. Then, the second part presents the logical-mathematical principles that are the foundations of digital computing. The third part presents the development of hermeneutical ontology that allows the formulation of the stratification and categorization of the virtual world. Fi-

nally, conclusion presents some fundamental aspects of the findings made with this inquiry and the exploration that remains open for future research.

The philosophy of Nicolai Hartmann as the basis for an ontology of the virtual world

The ontological proposal presented is a philosophical research of the virtual world and digital computing developed on the basis of the proposals made by Nicolai Hartmann (1986) in the ontological, epistemological-categorical and axiological fields. According to this philosopher, a constitution characterization of the real world is developed with a theory that addresses the real world based on the strata that constitute what there is, the categories selected to know what there is, the values of each person and the omissions about the interpretation of the world.

The theoretical framework under which Hartmann's contributions are collected is known, as Hartmann and Peterson (2012) point out, as a kind of critical ontology that seeks to get rid of the influence of traditional ontological metaphysics, a trend present in the current approach to ontology, as proposed by Gabriel (2018). A necessary condition to avoid baseless speculation, and thus to be able to focus on what is possible to recognize from the sphere of knowledge about the real world and the ideal world (The logical principles that function as standards for the construction of the world), as indicated by Cuéllar (2012) and Dziadkowiec (2011).

This perspective is embedded in the debate of contemporary philosophy on ways to address the surrounding reality. In particular, that of the contemporary digital telecommunicated society, as characterized by Cubitt (1998), who points out that even traditional ethics have been disrupted in digital virtuality, based on the idea of sharing the world with the other: "In the virtual world, the other has ceased to be a real, material presence, to transform into a distant utopia that we only see in a screen" (Cubitt, 1998, p. ix).

Regarding Aguilar (2011), the implications of virtualizing the reality of a world perceived through the mediation of technologies such as artificial intelligence, cybernetics, big data, among other technologies, force philosophy to think about the existence of man as an agent of action in the artificial environment he has created. This task must be approached from multiple fields such as ethics, aesthetics, hermeneutics, logic, epistemology, among others.



However, one problem in many of the reflections made from philosophy on the virtual world is the fact that it is self-referential. As is the case with authors such as Lev Manovich (2018 and 2020), Sadin (2017), Huhtamo and Parikka (2011) or even more sociological perspectives such as Bauman (1999). All these authors, and many others, develop important reflections on virtuality and its implications in human life, but most of the time they focus their analysis on one, or some, of the aspects that are more relevant to them, ignoring the underlying structures that allow the existence of a virtual reality mediated by technology.

Any philosophical analysis of the virtual world requires a solid foundation distant from the specific phenomenon it addresses, to avoid focusing the analysis on a specific categorical domain of this phenomenon, which is the result of the fractality inherent in the complexity of this new reality. To achieve the right foundation, the philosophical thought directed toward the products and practices of virtuality must come from the foundations of the new digital world, to avoid the self-referential problem typical of the analyses and inquiries carried out nowadays.

In this sense, De Landa (1997) points to the need to advance to an ontological characterization of the world built from digital technologies. The author proposes a method that could be characterized as historical ontological, centered on morphogenesis as a category of analysis taken from the thought of Deleuze and Guattari.

De Landa (1998) identifies three overlapping layers on which the present reality is structured: the geophysical conformation of the matter that constitutes the world; the emergence of the life of species and the consequent genetic processes; and, on these previous layers, the development of the universe of symbolic exchange formed from language, the world and culture.

Digital technological culture emerges in this last layer, which allows coexistence in societies. De Landa (1998) considers that, in terms of digital virtuality, every digital product is determined to a greater or lesser extent by an approach that can have hierarchical order or reticular type. Both fall into two more abstract categories, formulated by Deleuze and Guattari, which would be heterogeneous strata and aggregates.

For De Landa (1998), the strata correspond to a homogeneous nature characterized by control mechanisms, while the heterogeneous aggregates are characterized by the multiplicity and fractality of their components, defined by the way they are grouped. These categories are the basis of a proposal for ontological theory of digital computing products. In this context of the contemporary philosophical debate, it is possible to



perceive the echo of the ontological strata theory and categories of Hartmann (1986), who organizes his research on the basis of the stratification of the world, which he called factory of the real world. Dziadkowiec (2011) structured this stratification proposal from the division of four possible strata: material, organic, psychic and social-cultural. There is a categorical correspondence in these four ontological strata with the three spheres of being, the real, the ideal and the knowledge, as Hartman points out in accordance with Cicovacki (2014).

The purpose of this article is to open ways to a hermeneutical ontology, whose purpose is to explain the stratification of the emerging reality of digital computing, known as virtual reality or virtual world, explained from the sphere of knowledge, but based on the substrate of logical laws and special categories in the sphere of the ideal being. A virtual reality built from the strata that make up the sphere of the real being that allows the emergence of virtuality, in its fourth and most superficial stratum.

To this end, Hartmann's critical ontology is very appropriate for its systematization centered on the material of the real world, away from metaphysical considerations. This ontological model, based on the strata and categories theory, can be a solid basis for advancing on a virtual ontology with useful results. In particular, if a foundation is sought to consider this new universe of interactions with the distant, as referred by Cubitt (1998), and of which, ontological considerations made from Hartmann may provide new lights for the philosophical or epistemological approach (Cicovacki, 2001).

The project to carry out ontological research based on Hartmann's philosophical precepts, according to Poli and Seibt (2010), is shared by a group of researchers from various fields of science and technology. They have used philosophical ontology as a research method in various fields of study such as linguistics, biology, ethics, computing, among other branches of science and technology, or esthetics, as is the case of Claramonte (2016) and his *modal esthetic*, since the ontological foundation, especially Hartmann's theory, serves as a reference and gives them a coherent sense.

Although not evident, philosophical ontology and ontology as computer technology respond to the same type of questioning. As shown by studies such as Poli and Obrst (2010), Poli, Healy, and Kameas (2010) and Guizzardi and Wagner (2010), today we work on unified models of ontological approximation that seek the convergence of the categorical analysis of philosophical ontology and computational ontology technology methods in different fields of computing and cognitive technologies.



The initial premise of hermeneutical ontology is that the strata of the virtual world are an objective of human consciousness, therefore, they correspond to the strata of the real world, specifically those of the real being. This correspondence can be briefly characterized as:

1. The stratum of the physical-sensitive identified as ‘hardware’.
2. The stratum that fulfills the organic ‘vital’ function of programs that give dynamism to the behavior of the physical machine, known as ‘software’.
3. The stratum that fulfills the sensitive function of perception, which corresponds to the flow and processing of information: input, computation and output, which implies the human-machine interaction, dominated by the relationships of this data exchange known as ‘interface’.
4. The stratum of the social-cultural, in which there is the ‘inter-connection’ between lots of individuals who create an infinite network relationships and possibilities for action through a variety of devices. Hartmann states that: “correction happens where all laws of the logical structure are respected” (Hartmann, 1986, p. 195). In this sense, logical certainty functions as a substrate for the relationships inherent in the virtual world factory in its lowest stratum.

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Logical-mathematical principles as the scaffolding of the virtual world

In the virtual world factory, as in the real-world factory, there is an intervention of the ideal sphere and the logical sphere. Ideal structures are not only a gnoseological aspect of logical understanding. Only from the logical sphere is it possible to grasp the principles, the substrate and the relationships of the virtual world factory.

As Hartmann (1986), the logical sphere is a sphere of data reduced to laws of relationship, of empty forms of content. However, because of the mathematical logic essence of digital computing, the logical sphere is very important for the factory formation of the virtual world.

According to Astorga (2017), mathematicians David Hilbert and Wilhelm Ackermann in their work *Foundations of Mathematical Logic*, raised the so-called decision problem (*Entscheidungsproblem*) in 1928. The decision problem can be described as the question of the existence of

a general algorithm, which allows to decide if a first-order logical calculation formula is a universally true theorem in all its models, i.e., if there is a general algorithm that determines the truth or falsity of any proposition in a formal system.

The search for a response to this problem resulted in a set of mathematical investigations carried out in the 20th century, between the decades of 1930 and 1940, known as the *Theory of Computability*, which theoretically developed the foundations of current computation.

In particular, the contributions of Alain Turing and Alonzo Church, who worked under the influence of the approaches of Gödel's *Incompleteness theorems*, are pivotal. These theorems answered the decision-making problem raised by Hilbert, which was one of the most important fields of research in his program.

Hilbert's program consisted of the claim to base mathematics in logical principles, for which, as Astorga mentioned (2017), he tried to demonstrate that: A) mathematics is followed by a finite system of properly chosen axioms; and b) such an axiomatic system can be consistently tested.

Gödel's work gave a negative response to Hilbert's statements. In accordance with Nagel and Newman (1970), this is because the first theorem of Gödel's incompleteness points out that: any recursive arithmetic theory that is consistent is incomplete. While the second theorem indicates that in any consistent recursive arithmetic theory T , the consistent T formula is not a theorem.

The theories of Church and Turing occurred separately, with diverse solutions that agree in their results. This situation is a demonstration of the principle pointed out by Hartmann (1986), according to which there is full agreement between the laws of the logical sphere and those of the real being.

According to Sieg (2008), Alonzo Church, along with Stephen Kleene, proposed a formal system called *lambda calculus* to demonstrate the existence of undecided problems. This can be considered the simplest universal programming language. It consists of a simple transformation rule (variable substitution) and a simple schema for defining functions. This formal system allows expression of any computable function, like a Turing machine, so both procedures are equivalent.

According to Copeland (2020), Turing theoretically conceived a computer machine whose function is to perform the numerical calculation process mechanically, thus reducing the decision problem to another equivalent, the 'halting problem'. This is to determine whether running a machine with a coded input data ends in a finite number of steps, or if

it falls into an infinite circularity. To this problem, Turing found an answer through the theoretical enunciation of his computer machine. This problem can also be solved applying *lambda calculation*, in both cases undecidability is checked.

The theory of computability is based on these two developments of mathematical logic theory. Church-Turing thesis bases processes from the ontological perspective by which one can begin to assume the way of being typical to the stratification of the virtual world. The way the virtual object is based on a first fundamental stratification that corresponds to the hardware and software layers allow the existence of the intangible conformation of the virtual.

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The layers of the virtual world factory

Hardware: The material layer of virtuality

Turing solution ideally conceives a machine that performs calculations from a series of clearly stated logical instructions. His idea inspired the need to make a technological device that behaves as ‘universal Turing machine’.

A real technological conformation that is able to imitate the behavior of a Turing machine. According to Church-Turing thesis, it means the possibility that a device solves any problem that can be processed by an algorithm.

Likewise, Woolley (1994) explains: “Today we call ‘algorithm’ any mathematical procedure that can be executed by mechanical and automatic means, without the need for any human imagination or creativity” (p. 34), i.e., any effective computation method for any reasonable definition of terms.

The universal architecture solution for a universal computer machine was given by John von Neumann (1993). It consists of a central processing unit (CPU) consisting of three components: an arithmetic logic processing unit (ALU), which performs arithmetic and Boolean logic operations with ‘yes’, ‘no’, ‘and’, ‘or’ operators; and a control unit whose function is to locate, interpret and execute the instructions stored in the main memory. In addition to input/output BUS or device. Storage memory and peripheral devices that allow the input and output interfaces of information are added to these components.

Hardware, as a physical media, results from the idea of configuring circuits to execute programs, calculation procedures of logical-algebraic formulations—algorithms from physical processes artificially created by man, through the manipulation of electrical energy, using various electronic components specially manufactured and assembled for this purpose.

This stratum exists independently the instructions or commands that overlap it, thus complying with the law of autonomy and independence established by Hartmann for the ontological stratification of any entity.

The 'analogue' emerges for categorical analysis. This category is understood as the relationships of behaviors that occur equally in two different objects, one in the dimension of the ideal being and the other in the dimension of the real being. This parallelism allows a real being to imitate a behavior of an ideal entity—determined in accordance with certain logical laws—by allowing the transit of the merely theoretical or conceptual of mathematical logical laws of calculation to its recreation in real physical electronic circuits.

In the physical behavior of the materials used for the development of hardware components, there is a new special category, 'configuration'. Those materials that have the conditions to conform according to behavior parameters that are appropriate dominate a categorical spectrum typical of the physics laws.

In terms of behavior, according to logical-mathematical standards, 'computable' and 'decidability' stand out. In the case of cyberspace, this last category is opposed to infinity. Since, although the scope of this virtual space may seem inapprehensible, as it is within the categorical laws of the computable, it always has finitude. In the case of hardware, fineness is determined by the actual physical capacity of the components that imitate the universal computer machine. The real computing and memory capabilities of a computer are in a temporal dimension, so they are typical of the sphere of the real being.

An example of the lower level of the 'hardware' layer can be seen on the circuit configured as the computer processing unit, which virtualizes the logical operations executed by man under certain parameters or rules of behavior. Another example is virtual memory, a process that seeks to overcome certain physical limitations of the design of 'computers'.

Virtuality is linked to the hardware shaping elements located in the most superficial layer, or limit, that play a role in the process of human-machine interaction. Hardware-specific devices are called peripheral interface. Its primary function is to allow the input and output of machine data.

A key element in the virtual emergence was the development of interface devices—input and output of information—to make them closer to human conditions of perception and communication. According to Lau (1990), the technological evolution of the interface devices allowed dialogue with the machine to be ‘more natural’ or ‘less artificial’, making the machine more likely to man.

The visual interface, known as a monitor or screen — screen or video display — ceased to be a bulky, monochromatic device, in which a grid of light beams was formed to construct images from its activation in a grid made up of small points known as pixels. The current displays are the privileged interface device of the conformations of contemporary hardware.

As Henderson (1999) points out, today’s LCD screens allow the display of high-quality, high-definition images, in a range of 256 000 colors or 64 shades of gray, which is equivalent to the color perception capability of the human eye. This technology seeks to generate that interaction perception with the computer machine

On the other hand, the display device has integrated new layers of hardware sensitive to the human touch, resulting in an experience close to the perception of physical reality. A display on a mobile device incorporates motion sensor technologies, making it more than just an information output interface device. Today the display is a fully interactive device, with simultaneous input and output of information. It is possible to enter information into the computer for processing through touch and motion-sensitive screens, and observe the response of the machine, equivalent to state changes by the machine.

It is also the case with audio-measuring interface devices. There are ear displays that generate sounds from digital codes that imitate the human voice, which are capable of broadcasting messages in the phonetic code of natural languages. There are correlated input devices that allow the human voice to be captured, digitized to be decomposed and translated into a digital code recognizable by the machine.

The most known interface devices are those sensorially privileged: visual, sound and touch. Although, according to Barfield and Danas (1996) and Richard, Tijou and Ferrier (2006), there are also peripheral interface that imitate the sense of smell and taste. There are even motion-sensitive interfaces, which encode and interpret this as data processed and that generate changes in machine behavior. These devices can be combined to generate multisensory experiences that represent the highest virtual degree in the hardware.



As can be seen at this gradation level of the physical stratum of the virtual world factory, special categories are those that have to do with human-machine interactivity. In particular, the 'sensitive' of the virtual world. It allows the connection between human thought and its extensions in the universal computer machine.

To the extent that the human-machine interface devices are closer to conditioning the perception of man, they allow a more intensive and extensive use of digital technologies, characterized by Lieberman, Paternò, Klann, and Wulf, (2006) under the 'friendly' category of use.

The human-machine interaction is also determined by 'usability'. This is understood as a special category of this layer which dominates in the case of interface devices, and which groups a set of categories such as: 'interactivity', 'friendliness', 'versatility' and 'availability', which correspond to the gradation of the hardware layer's interface devices. These, in their functionality, respond to the paradigm of being used in multiple ways with different intentions.

In addition to the special category of interconnectivity, it is very important to highlight some categories that make up this group and that are dominant and complementary to this degree. One of these is 'ubiquity'. The level of hardware stratum defined by ubiquity contains the necessary support on which is cyberspace or virtual space dimension. It is because this is the one that allows human interaction and relationships in an area that is not determined by physical space, which enables a ubiquitous presence of the individual. Interconnectivity and ubiquity are categorized as 'mobility'. The creation of the infrastructure that allows the existence of the Internet has been designed to allow the user to permanently and comfortably use the universal computer machine for its personal use. It currently functions as an extension of the body and consciousness.

In the fourth and last strata, this possibility directly affects the emergence of the virtual dimension. However, both are categories of hardware stratum, as the shaping of the telecommunications infrastructure with the devices that allow its functioning is the one that determines its later use on which the upper layers of the factory of the virtual world are built.

The large amount of digital 'data' created, transmitted, stored and permanently modified corresponds to another very special category in the hardware layer; 'digital', which is the creation of digital objects from the encoding in terms of binary code of the information that defines their content.



Another gradation level of this layer of virtuality corresponds to the formation of memory devices that allow the storage of big amounts of digital objects that are created and modified permanently in the world.

The 'cloud', this interconnected and ubiquitous hardware and software conformation, according to Foster, Zhao, Raicu, and Lu (2008), is determined by categories such as 'storage' and 'accessibility' to information. These indicate the ability of this conformation to accumulate information almost infinitely and make it available to users of the computer network. Thus, virtualizing the memory of humanity. Artificial memory has profound implications for the development of culture, as it acts not only on human consciousness, but especially on artificial memory devices.

Hardware represents the physical layer of the physical world, in the case of the virtual world factory. Although it relies on theoretical, logical-mathematical formulations, and laws of the behavior of physical matter.

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Software: The behavior of the virtual machine

The second layer, the software layer, is formed from a substrate that represents the instructions that man indicates to the machine in digital code and the relationships that man establishes from the logical and algebraic indications that are expressed in the formal languages that CPU is capable of decoding and running. Software depends entirely on the hardware; without it the formulation of the computer programs is totally ineffective.

Between these first two strata it is possible to locate a gradation of elements that overlap and allow the upper strata to be based on it. This structure can be outlined as follows: the hardware that functions as the base layer, with the tangible physical dimension of computing. On it overlaps the stratum of the software, which possesses different gradations, that with the hardware form the dimension of the virtual space or cyberspace.

To understand the degree in which the software layer is formed, an ontological version of the England software conformation, Lampson, Manferdelli, Peinado and Willman (2003) is presented, which is the most widely used today.

1. *Firmware*. It is located at the lowest level, at the limit with the hardware. It is considered a 'low-level program' whose function is to establish the logic that controls the circuits of a microprocessor and is considered machine language. Low-level languages, or machine languages, are characterized by a high degree of abstraction and simplicity. The 'programmable' consists of

- indicating changes of physical state to the machine, basic codes representing possible configurations of matter
2. Assembly language. It is on firmware; its function is to symbolically represent the machine binary codes and other elements necessary to determine the processor architecture. The assembly language is a low-level programming language. This gradation allows to point out the emergence of the 'digital', the translation in binary terms, digits, from 1 and 0, of the instructions given to the machine.
 3. Kernel. It has a pivot function between the instructions given in the machine control programs code and the hardware. It is a privileged software (to which the computer user does not have access). Kernel manages and allows orderly access and secure use of the computer's physical (hardware) resources by the various programs that demand it. This is because the hardware resources are limited. Categorically, it is evident that this substrate is governed by 'organization' and 'administration' actions in terms of resource use and 'stratification' of processes, in accordance with their priorities for the needs of the system. This is the dominant categorical set at this level of basic software gradation.
 4. Operating system. It can include the kernel, or be independent to overlay it. This is a degree of software closer to the end user. It consists of several programs whose main functions are: process management, main memory management, secondary storage management, input and output system, file system, protection systems, communications system, system programs and resource manager.
 5. 'End-user applications'. These are the programs that determine how the universal computer machine is; each of these determine the required behavior of the machine. These are the instructions that allow to virtualize countless functions, allowing the computer machine to behave like a calculator, a text transcriber, a videophone, a chess player, the simulation of an ecosystem or an economic, political or social environment. This gradation should not be confused with the next stratum, although it is supported on it, the interface requires interaction with man and data entry by man, and that is not inherent to the software.

In the software layer, applications have been developed that are not intended for the interface between man and machine, but for the interconnection between machines. The standardized protocols that make it possible to handle this communication are composed of code systems, or common languages between computer machines. This allows the integration that makes up the networks of machines that work together known as greeds and computers networks, the top layer of the virtual world factory and the one that makes up the cyberspace.

There are programs in the software layer that indicate the behavior of the machine and the human-machine interface applications. In a higher gradation, there are applications that take care of the interface that interprets the man-machine-network-machine-man interconnection. In this way, the processes for the output of information from the machine and the networks of machines are presented in a friendly way, making them accessible to the end users. This complex communication and interaction are at the upper limit of the software layer. It is the layer of the interface which allows the development of remote computing that overlaps the shaping of the hardware layer in the use of the network structure and information databases accessible through them.

From an ontological point of view, in this layer of the factory of the virtual world, what predominates is the infinite possibility of programming and giving instructions to the virtual machine. Since it can behave like any machine, its way of being will always be an emerging state that will depend on the behavior told to comply with, or, the result of the multiple variable combination that the computer machine incorporates into its programming processes.

In this gradation of the 'software' layer, it is evident that the universal computing machine, or 'universal virtual machine', can behave like any machine by virtualizing any behavior. The stratum of the software is defined by the need to indicate the behavior to the machine, from which it is said that a category of this stratum corresponds to the 'programmable'.

The programmable category is located in the center of the substrate of the 'virtual', since it corresponds to the possibility of generating instructions that, when combined with the possible behaviors for the universal machine, produces an infinite range of possible behaviors, 'virtual'. 'The virtual world' is dominated categorically by programming. For this reason, it is important to determine the way of being of this special category, which lies in the ontological analysis of human-machine communication.



The linguistic dimension in software ontology

The 'machine language' is at the lowest level of software. These are the programs of the imperative language programming paradigm, which translate into a code made up of formal languages, where the procedural instructions of an algebraic logical system oriented to this type of object are found.

The machine interprets any instruction of physical behavior, of electronic circuits, to execute operations sequences that allow to perform correctly any instruction stated in a formal language. This is what makes a universal computing machine, capable of imitating the functions of any machine.

The stratum gradation of the factory of the virtual world is heterogeneous compared to that of the lower stratum. The functional programming languages, and those that were later developed, obey the declarative paradigm, which corresponds to the design of programs in languages that do not take into account the physical architecture (the hardware) of the computer, although it does presuppose its existence. However, this paradigm opposes the imperative paradigm, which is based on the computer architecture. To do this, they work from instructions that regulate the flow of information translated into physical states, indicating the computer how to execute the instructions made by the programmer in a correct syntax in the language designed, as proposed by the Turing machine.

These two paradigms indicate possible ways of being of the elements found in the software, and which are derived from their theoretical assumptions, although both are equivalent, according to the Church-Turing thesis.

Programming is accomplished through a communication process, as it meets the conditions for the emission of a message by a sender (programmer) and the reception by a receiver (universal computer machine); for this process to be completed, as in all communication, a common medium and code are necessary, this is the use of a language, as well as interpretation and decoding of the message.

Programming languages are communication systems between men and machines, the linguistic condition in an ontological sense, understood by Corona (2019) as what categorically determines the second layer of the factory of the virtual world.

Linguistic, as a category of the second stratum, enables the language of a hermeneutics of software, —man-machine language —; the interpretation of the code by which man communicates with the ma-

chine and processes data, generating a response, which is received by man through an interface device.

These systems structured as languages are formed by signs, which according to the classical formulation of the theory of signs, formulated by Charles Morris (1985), are determined by significance. As Ferdinand de Saussure said (1980), or more recently Thaliath (2019), it requires the existence of a code which is the significance and the content described which is the meaning or reference. Due to temporal execution, the signifier is deployed linearly and sequentially.

The language that allows man-machine communication is an artificial language created by man. In this sense, it is due to certain special conditions that define it. It is a formal language, such as logic, which implies a rigorous definition of its terms, its signs, and the correction of the construction rules and their interpretation.

From the linguistic ontological point of view, the gradation law is complied and three categorical levels are structured that overlap and allow the compilation of languages understood by man and interpreted by the machine; according to Astorga (2017) these categorical levels are:

1. The 'morphological', which corresponds to the way in which the lexical units are formed, necessary to construct lexical parser.
2. The 'syntactical', which establishes the structure and the various relationships that are allowed between the lexicons in a sentence, necessary to construct syntactic parsers.
3. The 'semantical' determines the correlation between the sentence structure and its meanings. This is required to interpret the language parser

In this context it can be said that there are the necessary conditions to point out the two special categories that dominate, from the ontological point of view, the linguistic condition of computer programs: computational 'expressiveness' and 'effectiveness'. These involve a hermeneutical point of view. The dialogue with the machine does not support polysemy, the interpretation must be unambiguous and achievable. These categories are necessary conditions that must be met in programs that fulfill the hermeneutical functions of interpreter, translator or compiler.



The third layer, the interaction: The way of being of the virtual object

The virtual object, made up of that *sui generis* matter that is digital, has characteristics that require its determination for its correct understanding. In principle, it does not correspond to the material layer. It is the product that emerges from the relationships between the substrate into which the information entered, contained and processed by the hardware and software complex is converted, once it emerges as a result of the interaction with man.

Two phenomena that can be noted in the ontological analysis of the virtual world factory result from this activity:

1. The content occupied by cyberspace: digital objects.
2. The network of hardware and software resources that structure interconnected computer networks, known as 'Internet', which, from an ontological point of view, supports cyberspace as the fourth layer of the virtual world factory.

Both phenomena occur as a result of the interaction of the universal computer machine with man, and in turn with other machines. The special category that allows to grasp the result of this communication is 'virtuality', present in all strata of the virtual world. This allows understanding the reality effect of creating digital objects.

The emergence of the phenomenon called virtuality is what connects the hardware, software and human thought, whose domain corresponds to the third layer of the factory of the virtual world, the 'interface', but which rests on the lower strata. The virtual object corresponds to digital object mediated by human action, which produces real effects for those who interact with it.

The existence of the virtual object is determined by the 'interactivity' category, which corresponds to the action that begins and culminates in human reason once there is input and output of information to the universal computer machine, something that occurs in different moments, which is aided and enhanced by the computer's artificial behaviors.

The ontological condition of the virtual objects that make up the virtual world factory is determined by the need to be for someone. The virtual object does not exist without the participation, updating and permanent understanding of the human reason that comes to their representation. This 'being to someone' is a condition of the virtual object,

which defines it from an ontological point of view as a ‘symbolic representation’, with the attributes defined by Gadamer (1991) as category.

If the essence of the virtual object is that of being a symbolic representation, it is possible to understand other categorical attributes from this ontological characterization that determine it. As for its existence, although real, it is always ephemeral; it corresponds to the moment when someone participates in the representation of the virtual object. It is updated in the dialogue with the machine and, consequently, there is a hermeneutical understanding experience that completes its existence in that being for someone. Once the dialogue between the machine and man is over, the digital object disappears and stops existing, at least in its virtual mode. Its existence is limited to the content of instructions encoded in the format of the file containing the digital object.

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Before and after the interaction experience with man through the computer machine interface, the virtual object does not exist, it vanishes into layers and layers of code that is finally translated into binary codes stored in bits, which according to Negroponce and Plaking (1995), is the measurement unit of the digital code.

Another category that defines the virtual object is ‘multiplicity’. It is based on the conformation of the matter that is the digital code, constituted as a set of instructions to the computer machine. There is no individuality principle, since every time a file containing a digital object is played, it is exactly identical to the original file, thus disappearing the difference between original and copy. It is executed identically by the universal computer machine that meets the requirements of components and devices needed to do so.

This proves that the virtual world is something *sui generis* in terms of the real dimension, and according to Hartmann (1986), identity and temporal are special categories that define the real. What characterizes identity, as to the unique condition of the virtual object, is its unique possibility as symbolic representation. Each participation in the representation of the virtual object is unique, since in the historical condition of the human consciousness it experiences each moment only once; in terms of its conformation, the digital object is identical and multiple each time it is updated. Human experience gives digital object virtualization the condition of unique experience.

The experience of the virtual object in the upper layers is based on the gradation of the lower strata on which the virtual world factory is supported. In the case of hardware, interface devices allow human interaction with the machine; and in the case of the software, the gradation of applica-

tions allow the interaction, which are the programs that indicate behaviors to the machine, and which are designed to be used by ordinary people.

In both cases, the dominant categories are those that point to the possibility of forming the universal computer machine as a device that operates from a very important special category in the factory of the virtual world, that of the 'interface'. This category allows the computer machine to act as an extension of the human body, due to the possibility of being personalized by each user, making it interactive, friendly, portable and adaptable.

The next step in the virtual world factory is the creation of digital objects that do not virtualize phenomena of the physical dimension, but whose objective is to define information about other digital objects. In this layer, the relationships of the virtual substrate become much more complex, since, from digital objects linked to other digital objects, new digital objects are created whose relationship is to provide exclusive information about the digital conformation of these digital objects. This technology is based on the so-called semantic web or web 3.0.



The fourth layer of the virtual world factory: 'digital communication'

In the beginning, universal computing machines were designed for interacting with man, like many other tools. Hence the importance of the development of the previous stratum, where occurs the interface that allows human-machine communication. However, once an artificial entity is developed that is capable of communicating with artificially defined languages, a new paradigm of machine shaping emerges.

The shaping of the artifact that emerges by incorporating telecommunication technologies into digital computing and computing produces a new entity. It has the ability to virtualize complex behaviors of universal computing machines, as it functions as an auxiliary mechanism of consciousness that incorporates the capacity of human socialization.

The result is a multidimensional compound of virtual relationships, activities, interactions, programs and behaviors that occur in the dimension of cyberspace and is known as the information society. One of the trends that the society of digital technological culture develops is 'The Internet of Things', as presented by Espada, Martínez, Bustelo and Lovelle (2011), as a trend that seeks to develop technologies that interconnect

machines with specific features to virtualize and control their operations remotely and automatically.

Universal computing machines are not physical realities like a car or a vacuum cleaner. They require the stratum of the hardware, but in their higher and more developed strata, like that of distributed task software. It is possible to design the programming of computer behaviors that provides the ability to perceive the environment, and, thus, behaviors of self-determination, adequacy, prediction, and learning in a high autonomy degree to fulfill its functions. All this, according to Klusch (2012) and Demazeau, Dignum, Rodríguez and Bajo (2010) characterize them as 'intelligent agents'.

This is one of the most advanced phases in the development of 'artificial intelligence' (AI). One of the last frontiers of cognitive science and technology, which, according to Russell and Norvig (2016), AI is an artificial machine that performs tasks that maximize its chances of success in executing a function. As can be seen, this is a very advanced degree in programming the behavior of the virtual universal machine.

Human interaction with application interfaces built using the 'AI' parameters incorporate a set of technologies, such as 'geolocation' as noted by Wong, Stoyanov and Sirer (2007) or 'augmented reality' according to Bimber and Raskar (2005), enriching the experience of the reality of the virtual world, thereby building experiences that are only possible in this dimension.

The 'web' is the most user-friendly interface on the Internet. It does not have a plain conformation, it is structured from gradation relations, which begin in the stratum of the software, and rise toward the stratum of the human-machine interface that is concrete in the digital objects, in addition to having a reticular or heterogeneous aggregate architecture, as characterized by Landa (1998). The upper stratum of the factory of the virtual world, that of the 'virtualized consciousness' emerges from the interconnection with the machines.

The next gradation level of the environment or interface of communication and interconnection is known as 2.0 or 'Social Web'. It has an ontological difference with the traditional web focused on multidirectional communication. Social networks consist of platforms that enable the creation of user communities, registered in these environments for communicating and exchanging objects and virtual experiences with other members of the group with whom they share interests.

As for the gradation of the last stratum of the factory of the virtual world, and its categorical determination, there is Web 3.0, also known as



'semantics web', although it has this numbering that refers to a chronological or sequential order, in accordance with Barassi and Treré (2012), it actually co-exists and functions as a support for the emergence of the most complex social web environments.

Conclusions

It is possible to point out that an ontological characterization of the strata that make up the factory of the virtual world, following the ideas indicated by Hartmann, allows to understand the marked emergence process of virtuality.

The stratification of digital objects and the virtual world proposed differ from theories such as the heterogeneous strata and aggregates raised by De Landa, and other theories about virtual products, in its ontological foundation that characterizes the emergence of the virtual world to a stratified process that goes from the material base to digital virtuality. In the case of De Landa, his theory focuses on the elements of programming, software, without considering the emergence of the virtual as a process based on a material reality, which, in a stratified way, allows the appearance of virtuality. The ontological proposal presented here seeks to account of the complete process that allows the transit between matter and the physical processes that occur on it until the formation of the virtual phenomenon. It consists of a sequence of four strata:

- The matter of the configured components, known as the hardware.
- The vitality of an organic behavior, which as a motor provides instructions that change the behavior of the previous stratum, that of the software.
- There is interaction between men and the machines of the communication interface produced by artificial languages, in the strata of sensory perception, consciousness and psyche.
- The product resulted from these interactions between men and the machine represents a new reality for humanity, the virtual world, with practices and traditions that form cyberculture.

The characterization of the four strata of the virtual world factory presented here is a contribution to understanding this emerging phenomenon of the digital technological culture of the 21st century. However, this approach is limited to an ontological research that does not seek



to advance speculation about the ways of being of digital culture and the virtual world.

Ontological research is only intended to account for 'How', i.e., to point out the way in which the shaping of the network occurs. As for 'what', multiple lines and research programs remain open, which can be based on this ontological characterization to investigate from the epistemological, the axiological, the logical and the esthetic perspective, special content that integrates all dimensions of what has been characterized as cyberculture.

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THE EXPLANATORY FUNCTION OF THE NOTION OF INTERNAL REPRESENTATION

La función explicativa de la noción de representación interna

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Abstract

The aim of this paper is to present an objection to one of the main principles of the Representational Theory of Mind (RTM): the idea that the notion of internal representation has a central function in the explanation of cognitive activity. According to the RTM, the cognitive life of an organism basically consists in the formation, processing, and storage of internal representations. Such representations are viewed as concrete objects or events that are able to causally influence the cognitive processes of organisms. Presented as a dilemma, the objection aims to show the intrinsic difficulties of the postulation of internal representations, given the way in which these representations and their operation have been conceived in the framework of the RTM itself. The question that introduces to the dilemma is: in virtue of which properties does an internal representation influence the cognitive activity of an organism? Two answers are possible: in virtue of its representational properties or in virtue of its no representational properties. Employing an argumentative methodology, the problematic consequences of both answers to the dilemma will be shown and two important examples from the literature will be discussed to illustrate these difficulties. The main conclusion of the paper is that the notion of internal representation is unable to satisfy the explanatory function that has been assigned to it by the RTM itself.

Keywords

cognition, explanation, information, function, normativity, causality.

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Resumen

El objetivo de este trabajo es presentar una objeción a uno de los principios centrales de la Teoría Representacional de la Mente (TRM): la idea de que la noción de representación interna tiene una función primordial en la explicación de la actividad cognitiva. De acuerdo con la TRM, la vida cognitiva de un organismo consiste esencialmente en la formación, procesamiento y almacenamiento de representaciones internas. Tales representaciones son vistas como objetos o eventos concretos capaces de influir causalmente en los procesos cognitivos de los organismos. Expuesta en forma de dilema, la objeción pretende mostrar las dificultades inherentes a la postulación de representaciones internas, dada la manera en que estas representaciones y su operación han sido concebidas en el marco mismo de la TRM. La cuestión que introduce al dilema es: ¿en virtud de qué propiedades una representación interna influye en la actividad cognitiva de un organismo? Dos respuestas son posibles: en virtud de sus propiedades representacionales o en virtud de sus propiedades no representacionales. Empleando una metodología argumentativa, se mostrarán las consecuencias problemáticas de cada una de estas respuestas al dilema formulado y se discutirán dos ejemplos importantes de la literatura para ilustrar estas dificultades. La principal conclusión del artículo es que la noción de representación interna es incapaz de satisfacer la función explicativa que le ha sido asignada por la propia TRM.

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Palabras clave

Cognición, explicación, información, función, normatividad, causalidad.

Introduction

According to the Representational Theory of Mind (RTM), the cognitive life of an organism consists essentially on the formation and storage of representations and the application of operations to such representations, according to authors such as Sterelny (1990), Fodor (1998) and Fodor and Phyllysyn (2015). Given an individual or an A category, the ability to represent A consists on the ability to form—in the mind or in the brain—representations of A. Thinking of A in a t moment, is to form a representation of A in a t moment, in working memory. To retain information about A is to preserve, in long-term memory, certain propositional representations that include representations of A. To believe that there is an A in my pocket is to be willing to employing, in specific circumstances and processes, an internal representation whose content is ‘there is an A in my pocket’ in a certain way that systematically differs from the way in which this same representation (or another with the same content) would be employed if, instead of believing, I would like an A in my pocket.

Beyond the difficulties presented when these ideas are discussed in detail, one of the great attractions of RTM is the possibility that it offers to reduce the philosophical cognition problem to a single question: what ultimately explains something to be a representation? As noted above, for RTM supporters, representational capabilities derive essentially from the

power to form and process certain representations (internal or mental). Therefore, mechanisms or properties that ultimately explain that something is a representation cannot, from this perspective, depend on the prior possession of representational capabilities. How are these mechanisms or properties based on? According to a classical conception of representation, the similarity between ideas and objects is what explains something as a representation; on the one hand, that similarity connects ideas with their objects and, on the other, ideas are original representations, i.e., representations from which the other types of representations derive, particularly linguistic representations, as Fodor and Lepore said (1991).

The similarity between ideas and objects seems to satisfy the requirements of RTM, because it is not assumed that the existence of such similarity implies that the organisms already possess representational capabilities. Hence, it is still possible to find in some contemporary authors, such as Cummins (2010) and Johnson-Laird (2006), some adherence to sophisticated forms of the classical conception of representation. Classical conception, however, has its difficulties. For example, given that similarity allows degrees, what degree of similarity must exist between an idea and an object so that the idea can be considered a representation of the object? In addition, the similarity ratio is symmetrical: If A is similar to B, B is similar to A. Therefore, as Fodor (1984) has pointed out, if an idea is a representation of an object by virtue of the similarity that exists between both, the object would also have to be considered a representation of the idea.

But there are other influential proposals that do not use the notion of similarity. One of them is the informational semantics of Fred Dreske (1981). According to informational semantics, nomological relationships between the instances of R and the instances of A explain that a type R event represents a type A event; therefore, due to such relationships, R instances are capable of taking information from A. Imagine, for example, that R is the activation of a neuronal structure that cannot (nominologically) occur without a type A event, through some sensory stimulation causing it. Given this situation, we can state that R is an indicator of A, i.e., that R takes the information according to which A has occurred. According to informational semantics, under this relationship between R and A, R can be considered a representation of A.

Informational semantics face important problems like the classical conception of representation. The pivotal is the problem of error, pointed out by Fodor (1984): while representations can be true or wrong, nomological relationships may or may not exist, but they cannot be wrong.

Therefore, it does not seem to be true that by mere nomological relations between R and A, R can be considered a representation of A.

Several complementary notions have been introduced to reinforce informational semantics and give a solution to the problem of error, structure (Dretske, 1988), asymmetric causal dependence (Fodor, 1990) or incipient cause notions (Prinz, 2002). However, the aim of this work is not to discuss these or different proposals, but to make a general objection to the RTM. This objection, presented as a dilemma, is directed at its central thesis: the idea that the explanatory cognition foundation is the notion of internal representation.

Various objections have already been raised to RTM, some of which have been considered major challenges by representationalist theorists, such as Godfrey-Smith (2006). Among the most discussed recent objections is the so-called Hard Problem of Content raised by Hutto and Myin (2013). This problem is also presented as a dilemma. Hutto and Myin argue, on the one hand, that the conceptions of information acceptable from a naturalistic perspective are insufficient to support a true notion of internal representation and, on the other, that the information concepts that would allow a true notion of internal representation to be founded are unacceptable from a naturalistic perspective. Thus, according to these authors, in the current state of research on the notion of internal representation, either naturalism is preserved and RTM is abandoned, or RTM is preserved and naturalism is abandoned. The problem here is different and even more radical, because it does not depend on the acceptance of naturalism, nor is it based on the details of existing conceptions of internal representation. What is intended is to show that the notion of internal representation, regardless the way it is founded, is not able to fulfill the explanatory function attributed to it by the supporters of the RTM. Section 1 of this paper will present the dilemma posed to the supporters of the RTM and will discuss the consequences of each of the two responses presented. Two examples of key RTM representatives will be presented in section 2 to illustrate these difficulties. These discussions will be the basis of the conclusion of the article, namely: the notion of internal representation is incapable of satisfying the explanatory function assigned to it by RTM itself.

The dilemma of internal representation

As the supporters of the RTM mention, the power to form and manipulate internal representations is what, fundamentally, explains the possession of



representational capabilities. How do such representations fulfill their various functions in cognitive activity? In the framework of RTM, explanatory value from the notion of internal representation is not reduced to the mere intelligibility that results from the description of the cognitive processes of an organism in terms of manipulation of internal representations, but it is based on the capacity these representations would possess, as truly existing entities to influence causally on such processes

While the notion of internal representation can be seen as a component of an explanatory cognition model inspired by the functioning of public representations, an internal representation for RTM supporters is not merely an explanatory instrument without ontological implications, but an entity placed in the order of causal relations that is able to participate in them, as Ramsey (2007), Fodor and Phyllysyn (2015), Neander (2017) have pointed out.

Given this conception of internal representations, one wonders: what properties exert on an internal representation its causal influence on cognitive activity? Two answers for this question seem possible: either an internal representation has causal power by virtue of its representational properties, or its non-representational properties derive the power¹. Both options lead to serious difficulties for RTM. The explanation of these properties will be presented below.

First part of the dilemma

Suppose that R is a representation of A formed in the nervous system of an O organism and that the causal influence of R on the cognitive activity of O is possible thanks to the representational properties of R. Thus, in accordance with this approach, it is fundamentally from the fact, as such, that R represents A which derives the causal power of R in the cognitive activity of O.

But how can such a causal power derive from a semantic fact? In other words, how can a semantic fact be causally related, as a semantic fact, to other kinds of facts?

A simple answer is: through a process of interpretation and understanding. In order to be able to admit that that R causally influences the cognitive activity of O due to its representational properties, and not to other properties, it seems necessary to assume that the nervous system of O somehow ‘understands’ R and that this understanding of R determines, at least a bit, the cognitive processes performed in O. Since R represents A, understanding R is nothing more than representing A thanks to R.



But how can the O nervous system do such a thing? With regard to the problem of understanding language representations, the supporters of RTM often have a clear answer: to understand an E statement belonging to a L language is to create an internal representation whose content is the same as the content conventionally associated with E in L and to associate such representation with E. However, what about the understanding of an internal representation? When the problem is to explain the understanding of internal representations, it is obvious that it is not possible to appeal to the formation of new internal representations, since it would only be postponed.

The point discussed is related to Dummett's famous warning (1993) that any theory of meaning (or representation) that claims to be satisfactory must be accompanied by a theory of understanding. To assume that R is a representation of A, regardless of its spatial-temporal location and material composition, is to assume that R is destined to be understood; i.e., that as a representation of A, R must be able to allow any interpreter to represent A. Hence, if the existence of internal representations is postulated, the existence of internal processes of understanding must also be postulated, otherwise it would not be coherent to assume that the entities whose existence is being postulated are authentic representations. But since such internal processes of understanding cannot consist of processes of producing new internal representations, how are they to be understood?

Understanding representations is something that certain organisms can do: For example, humans can understand the language they have learned in childhood. However, when the supporters of RTM talk about internal representations, they refer to representations to which no one has proper access, because they are neural structures, i.e., structures literally located within organisms and not within the inner space (metaphorically speaking) of their minds. And although an organism may have sensitive access to some of its internal processes, such as digestive processes, what happens in the nervous system is not part of internal processes to which an organism can sensitively access. Thus, if there is an understanding of internal representations, such an understanding must be carried out by an internal component of the organism and not by the organism as such. But how can a simple component of an organism possess the ability to understand representations?

An objection to these ideas would be to point out that talking about understanding representations makes sense only if it refers to the capabilities that an organism can possess and not to the capabilities of



mere components of an organism. Assuming that an internal representation must be understood would be an error. However, if mentioning that understanding is inadequate in the case of internal representations, it can then be concluded that the use of the notion of internal representation by RTM supporters is a metaphorical use that would allow, perhaps, to form a simple and intelligible image of cognitive activity, but not to explain such activity under the criteria required by the RTM itself. The intelligibility of this image would derive from the fact that it uses linguistic communication as a model, the realization of which effectively implies the use of representations, but also of interpretation and comprehension capabilities. In order to contribute to the clarification of cognitive activity, as a notion of representation in a strict sense, the notion of internal representation should therefore be accompanied by a plausible notion of internal understanding. This latter notion, however, is no easy to understand because is intelligible independently of the other. The application of internal representations does not appear to be useful for the understanding of cognitive activity if it is assumed that their causal power derives from their representational properties.

However, an internal structure may have some kind of functioning that can legitimately be characterized as a representational functioning, even if such functioning does not presuppose the realization of internal understanding processes such as those mentioned. As Ramsey (2007) points out, it would be legitimate to assume that certain structures in an organism's nervous system are representations if it is somehow achieved to show that these structures function as representations, and therefore if it can be established that characterizing them is essential to understanding the processes in which they participate. But what role must an internal structure perform so that it can legitimately be assumed that such a structure functions as a representation? Strictly speaking, a R structure, event or object function as a representation of A, not only if it represents A, but also if it allows a system or body to represent A. But, in order for an A system or organism to be represented by R, it is essential that the system or organism be able to interpret and understand R. Thus, if this reasoning is correct, any application of internal structures that function as representations commits us to the existence of internal processes of interpretation and understanding of representations.

Likewise, Godfrey-Smith (2006) recognizes that RTM supporters cannot settle by internal representations, but must also admit the need to apply for internal 'readers' or 'interpreters' of such representations. For Godfrey-Smith, the activity of these 'readers' mechanisms must be rec-

ognized as an authentic interpretation activity, without being so sophisticated that can jeopardize the explanatory value of the application of internal representations (presupposing, in some way, the prior possession of representational capabilities).

But what kind of activity can satisfy such criteria? This problem is a central concern in the proposal of Garrett Millikan (1984, 2000, 2017), who bases his conception of internal representation not only on the specification of the relationship that must exist between R and A for R to represent A, but also in the type of processes to which R must be submitted and which would allow the organism in which R has been formed—or to an internal ‘reader’ mechanism—identify what R represents.

Millikan’s proposal is complex and will be discussed in more detail in subsection 3.1, where attempts will be made to show its inadequacy. From the perspective of this article, it is wrong to assume that it is possible to understand the explanatory value of the notion of internal representation from the notion of interpretation, since neither of these notions is easier to integrate in causal explanation.

Moving from the notion of internal representation to the notion of interpretation is not a step forward, but rather it shows that it has reached a dead end. Thus, the conclusion that can be drawn from this first part of the dilemma (which will be reinforced later) is that the notion of internal representation seems incapable of fulfilling the explanatory function assigned to it by the RTM.

The second part of the dilemma

But it may be possible to avoid these problems if admitting that the causal power of an internal representation derives not from its representational properties, but from its non-representational properties. Such is the position explicitly assumed by Fodor (1995, 2008), but implicitly assumed by many authors who, like Mercier and Sperber (2017), argue that an internal representation is a concrete object that possesses, like any concrete object, causal powers². Similarly, Neander (2017) adopts this position when stating that “if we naturalize mental representations in terms of certain unintended phenomena, the explanatory force of postulated representations will be the explanatory force of these unintentional phenomena in the most basic case” (p. 85)³.

Therefore, assuming that R is a representation of A formed in the nervous system of an O organism and that it is due to its non-representational properties that R causally influences the cognitive activity of O. In



this case, it does not seem necessary to postulate the existence of internal processes of interpretation and understanding of R, since it is not from the fact, as such, that R represents A from which derives the causal power of R, but from the properties that R possesses as mere neuronal structure. In other words, the question of how a semantic fact relates causally to other kinds of facts does not originate here, since causally related facts that constitute the cognitive activity of O would all be purely material facts. However, given such an approach, it is possible to ask: to what extent can it be argued that the non-representational properties of R exert their causal influence as non-representational properties of a representation and not as properties of a simple neuronal structure? In other words, why should it be assumed that the fact that non-representational properties of R are properties of a representation that must have some relevance to the causal influence they exert on the cognitive activity of O?

As mentioned, when RTM supporters talk about internal representations, they often assume, like Fodor and Pylyshyn (2015), that these are concrete objects or events, as “chalk marks on a chalkboard, ink marks on paper, uttered sentences, neuronal events, etc.” (p. 7)⁴. Another common way of assuming this idea is observed in the distinction between mental representations (in the brain or in the mind) and public representations (statements or images); it is usually assumed that both groups of representations are composed of discrete objects that differ basically in their location and material composition. Note, therefore, that R is a discrete object, i.e., in this particular case, a neuronal N structure (or, if preferred, the activation of N), located as a more or less well delimited component (or event) on O nervous system. What relevance does, for the causal explanation of the cognitive activity of O, characterization of certain properties of N have as non-representational properties of a representation? The answer is: None.

The brain mass fragment identified as N may certainly possess causally relevant properties for the cognitive activity of O. However, characterizing these properties as non-representational properties of a representation does not allow understanding its role in the cognitive activity of O, for the fact that N is a representation (i.e., the fact that N is R) it has no explanatory value in that activity, since it has been rejected that the representational properties of N have a causal influence on the cognitive processes of O. This explanatory incapacity is a consequence of the fact that, on the one hand, the neuronal N structure has been delimited assuming that it is a representation, but, on the other, it has been assumed that the representational properties of N (i.e., the properties of

N as a representation) are not causally relevant. The neuronal N structure does not have authentic functional significance in the cognitive activity of O, nor its properties, at least to the extent that they are characterized as non-representational properties of a representation. Generally, acknowledging that a representation is a particular object (or event) with causal powers does not force us to assume that all the effects that this object (or event) produces are necessarily related to the fact that it is a representation. Thus, even if N is a representation, it cannot be concluded, without additional reasons, that the effects N produces are related to it.

The nervous system of O, like any space-temporal object, is subjected to various forces that can affect it nomologically in different ways. But also, in addition to being a physical object subjected to causal influences, like any physical object, the O nervous system has channels through which it can capture specific causal flows that affect its internal structure in a more precise and controlled way. However, these causal flows are not, by themselves, information flows. In order for internal causal flows to be transformed into authentic information flows, they need to be properly exploited by the O. nervous system to clarify this idea, to illustrate, tree's growth rings.

As known, the growth rings that form the trunk of trees are related with the age of trees, so that a system or organism with the required capacities could collect information about the age of a tree from these rings. This does not mean, however, that growth rings should be seen, by themselves, as information-transmitting transporters, as growth rings are simple physical structures resulting from a certain series of causal events. Another example is an animal footprint printed in the mud: by itself, a footprint does not transmit information, but is a simple physical structure that is also the product of a series of causal events. In order for such a structure to be transformed into a genuine transporter for transmitting information, there must be an organism or system capable of exploiting the nomological connections that exist between the structure and the events of the environment (past, present or future).

Evidently, such a form of exploitation does not necessarily imply understanding the information, as it is simply a process through which the information is used in order to perform a certain function of the operating body or system. In summary, there is no real flow of information, no transmitting transporter, no exploitation processes of nomological relationships; and there are no exploitation processes of nomological relationships without using these relationships to satisfy certain functions⁵.



Thus, the causal flows in the nervous system of O, by themselves, are nothing more than causally connected and nomologically determined events. Assuming that these internal causal flows are information flows is to believe that the O nervous system, in addition, is structured in such a way that it is able to exploit the nomological relationships that exist between its internal causal flows and various external events in order to satisfy certain functions. These functions can be cognitive, such as visual or auditory perception, but can also have other functions, such as regulator of body temperature or heart rate.

Going back to R, i.e., a representation of A formed in the nervous system of O. R, as a concrete object (or event), is a neuronal N structure (or an activation of N). Is it relevant for the explanation of the cognitive activity of O to characterize the properties of N as non-representational properties of a representation? If the activity of the nervous system of O is seen as a simple causal flow, it is not possible to characterize N as a representation, nor its properties as non-representational properties of a representation, unless it is willing to accept the idea that the pure natural nomological order is sufficient to produce representations. But what if considering the activity of the nervous system of O, not as a simple internal causal flow, but as a true flow of information? Is it relevant, in this case, to characterize the properties of N as non-representational properties of a representation?

What precise function does N perform in the nervous system of O as a structured system? It has been assumed that N is a representation of A. The question is: Can this characterization lead to understand the function of N in the structured activity of the O nervous system? It is reasonable to assume that the properties of N play some, perhaps crucial, role in this activity. However, as noted above, it cannot simply be assumed that the importance of these properties in the performance of such a function — whatever it may be — is related to the fact that they are, as has been admitted, non-representational properties of a representation. For this, it is worth mentioning that it is relevant to the functioning of the nervous system of O to characterize certain neuronal structures as representations, even if the causal power of these structures derives exclusively from their non-representational properties. The fact of admitting that O nervous system is a structured system does not allow us to establish such relevance. Thus, the question is: How to show the explanatory relevance of the characterization of certain neural structures or events as representations?

One option is to argue that characterizing certain neural structures or events as representations is essential, or perhaps just useful, to

explain the structuring process of the nervous system. Such an option is not advisable, since it leads back to pansemanticism, in so far as it assumes the idea that, in the internal causal flow prior to the structuring of the nervous system, there are representations that contribute to this structuring by virtue of their non-representational properties.

A second option is to assume that the process of structuring the nervous system, or at least some of its parts, is a process in which internal representations are formed. The problem with this option is that it does not really clarify the function of the formed representations, since it could be assumed that simple structuring of the nervous system is sufficient to explain the cognitive activity of an organism, regardless whether there are representations that result, in some way, from the structuring process. In other words, the formation of representations, in this case, may be nothing more than an epiphenomenon.

A third option and perhaps the most convincing is to deny that simple structuring of the nervous system is sufficient to explain the cognitive activity of organisms and admit that it is not possible, or at least difficult, to explain such activity without characterizing as representations certain components or events of the structured system. Note that this statement is not an obvious approach, but a substantive compromise. Let us admit, however, its truth. The first question to ask is: Which components or events of the structured system should (or can) be characterized as representations? The most common response has been to characterize vehicles transmitting information as representations. This response is not, however, satisfactory. We have assumed, in accordance with RTM, that an internal representation is a more or less well-delimited object or event: a neuronal N structure (or an activation of N). But a vehicle that is transmitting information should not necessarily be viewed in this way. The existence of a flow of information, as noted above, implies nomological relations in order to fulfill certain functions. But the exploitation of nomological relations does not necessarily imply the delimitation of objects or events that can serve as vehicles transmitting information. The exploitation of nomological relations is carried out when, in the face of a relevant external stimulus, a response that contributes to the satisfaction of a function of the operating system or organism is generated. The structuring that enables such a response can be seen as consolidating an internal causal link between stimulation and response, without assuming that a particular object or event must be delimited in the events that constitute such relation. From this perspective, talking about information-transmitting vehicles would simply be a way to point out that the system



or organism reacts to a specific stimulus and would not imply a commitment to the delimitation of internal objects or events.

If ignoring this objection, it must be assumed that an information-transmitting vehicle may, at least in some cases, be a delimited neuronal structure (or its activation). If assuming that N is a vehicle that is transmitting information, would it be relevant to explain the cognitive activity of O to characterize the properties of N as non-representational properties of a representation? To understand the operation of N as a vehicle transmitting information, it is sufficient to grasp, on the one hand, that N is a neuronal structure whose activation depends nomologically on an A event (internal or external) and, on the other, that the activation of N contributes causally to the generation of a B response that satisfies, given the instantiation of A, a function of the nervous system of O. Characterizing N as a representation, and its properties as non-representational properties of a representation, is not relevant to this operation. On the other hand, assuming that the simple fact that N causally connects A to B justifies the characterization of N as a representation, which is not a good option, since this type of functioning is also relevant for the explanation of non-cognitive functions, such as hormone secretion, for example. Admitting that N is a representation would imply assuming the idea that every internal activity of an organism, cognitive or non-cognitive, is a form of representational activity.

But what if we assume that N specifically contributes to the execution of cognitive tasks and not to the satisfaction of other functions? Is it not now relevant to characterize N as a representation? According to Ramsey (2007), to capture the sense of computational explanations of cognition, it is necessary to assume that certain internal components that make possible to perform cognitive tasks are being used as representations. Consider an example of Ramsey: performing a multiplication operation. In a computational approach, it is typically divided the task to be performed into simpler subtasks, such as, in this particular example, the successive addition of a number.

These subtasks are executed by modules that process certain inputs and produce certain outputs. According to Ramsey, it is relevant to assume that these inputs and outputs are being used for the computational explanation, by the system itself, as representations of sums, respectively, otherwise it would not be possible to assume that the operation carried out is a multiplication, nor understand its success.

However, as Ramsey points out, the computational explanation does not question the fact that the task performed by the system is actual-

ly a multiplication operation, but simply assumes it. Therefore, the computational explanation must also assume that the processes conducted in carrying out this task are regulated, in some way, by the rules that define multiplication. Hence it may seem natural to characterize the inputs and outputs of the internal module as representations of sums, as this characterization is only a way of recognizing that there must be an influence of the rules of multiplication on the processes of the system (rules that could prescribe the successive addition by multiplying the number of times indicated by the multiplier). However, such influence has been explained. In other words, the characterization of inputs and outputs as representations of sums does not have a real explanatory function, but is an effect of the inevitable projection of multiplication rules on the behavior of the system, once assumed that the operation carried out is a multiplication. Of course, a theorist might try to explain how multiplication rules effectively influence the processes of an organism's nervous system when such an operation is performed. But addressing this problem is not the purpose of computational explanation, nor anything that such an explanation can solve.

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Hence, it seems to be inconsistent by the fact that the application of internal representations is explanatory relevant because of the causal influence they exert on the cognitive activity of organisms, and at the same time it admits that the representational properties of an internal representation are not causally relevant. Such an approach is equivalent to saying that internal representations are relevant, as long as it is ignored that they are representations. Given this incongruity and the difficulties discussed in this subsection, the conclusion to be drawn from the second part of the dilemma is the same as that of the first part: The notion of internal representation is incapable of satisfying the explanatory function assigned to it by the RTM.

Doing a recap of the results of the dilemma, if it is admitted that it is due to its representational properties that R (a representation of A formed in the nervous system of an O organism) exerts causal influence on the cognitive activity of O, the existence of internal processes of interpretation and understanding of R must be postulated. Such a situation leads to an impasse, as notions of interpretation and understanding are not easy to integrate into the order of causal explanation.

But admitting that R exerts such causal influence by virtue of its non-representational properties is not a better option. Indeed, if such a thing is accepted, it is not possible to argue that the non-representational

properties of R, as non-representational properties of a representation, have a true functional significance in the cognitive activity of O.

In other words, even if the non-representational properties of R had any role in this activity, it could not be argued that such a function has something to do with the fact that they are non-representational properties of a representation. Thus, the two parts of the dilemma lead us to the same conclusion: the notion of internal representation is incapable of fulfilling the explanatory function assigned to it by the RTM.

Two Examples

To reinforce the conclusion obtained in the previous section, two examples of the use given to the notion of internal representation are presented by two excellent RTM supporters: philosopher Ruth Garrett Millikan and the psychologist Susan Carey.

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First example

In her early works, Millikan (1984) makes an important distinction between intentional icons and representations. An intentional T icon is an internal structure that collaborates with a biological (not necessarily cognitive) mechanism so that such a mechanism can perform its own function. T's contribution to the performance of the function of the mechanism with which it collaborates is possible, according to Millikan, thanks to the fact that T corresponds to a state of things which is a normal condition for the proper satisfaction of that function.

The correspondence relationship Millikan speaks of is an isomorphism relationship: the configuration of constituent elements of the external things of which T is an intentional icon corresponds to the configuration of constituent elements of the T structure, and certain transformations of the configuration of this same thing correspond to certain transformations of the structure from T.

For Millikan, an intentional icon, despite being an internal structure with true intentional properties, is not yet one because of two reasons, a representation. The first is that an intentional icon contributes to the conduction of biological functions of all kinds, not necessarily cognitive. The second is that, unlike a mere intentional icon, an internal representation should not simply correspond to a state of things (internal or external) in order to satisfy a function, but it must also be processed in a way that it allows the organism to represent what it represents itself.

Indeed, according to Millikan, an internal representation, besides being an intentional icon, must allow the organism in whose nervous system it has been formed to 'identify' what is represented by it. Thus, from Millikan's perspective, the fundamental cognitive question is: How can an intentional icon become a true representation?

In other words: How can an organism identify the state of external things that corresponds to an intentional icon that has been formed in its own nervous system?

Note that this problem is nothing other than the above-mentioned problem (subsection 2.1) of how a representation of A formed in the nervous system of an O organism may allow O, or an internal component of O to represent A. What is Millikan's response?

Imagining that T is an intentional icon formed in the nervous system of O and that a component of the external state of things to which T corresponds is an A. The structure of T must therefore have an element that corresponds to the presence of an A in such a state of affairs. Suppose R is that element. How can R allow O identify an A component of the external things to which T corresponds?

For Millikan, identifying is re-identifying. More precisely, being able to identify what R corresponds to does not mean to be able to represent R, A to which R corresponds and the correspondence relationship between both, but to be able to grasp that the different representations of A formed in the nervous system represent the same thing, i.e., to be able to capture when A is represented again (when different components of different intentional icons correspond to the same). Thus, O is able to identify what R represents when it is able to grasp that the different representations of A formed in its nervous system, including R, represent the same thing.

It does not presuppose the possession of metarepresentational capabilities, but those cognitive mechanisms of O make their own representations. For example, in the case of mechanisms responsible for inferences, the different representations of A contained in the contents that constitute the premises of a reasoning must be able to be used when required, such as the common term that allows the conclusion to be derived. Similarly, in the case of the action, a representation of A in the content of an intention, and a representation of A in the content of a perceptive experience must be used as its representations.

An organism whose cognitive mechanisms use its different representations of A is, for Millikan (2000), an organism capable of identifying what these representations represent⁶.



Millikan's approaches respond the problem of the existence of internal interpretation processes of representations. Intentional icons that contribute to cognitive tasks would be 'consumed' in such a way that, normally, and when required, its different components would be processed—in perception, reasoning, or action—as components that correspond to it. Such mechanisms of 'consumption' – or 'readers' – of intentional icons would have been forged throughout the evolutionary development of species with cognitive abilities.

According to Millikan (2000), the question of what type of indicator determines when two components of different intentional icons should be processed as components that correspond to them is an empirical issue, for which there are plausible responses such as duplication of neural structures, the existence of some form of marker or synchronized activation.

The processing of components of different intentional icons as components that correspond to it would be observed in the behavior of the organism, i.e., in the actions, judgments and inferences that the organism carries out and whose success depends precisely on the identification of individuals and properties as the same individual or property previously represented.

In this way, intentional icons would be transformed into authentic internal representations that would allow the organism, in whose nervous system they have been formed, to represent what they presumably represent.

But is it really possible to admit that this processing of components of different intentional icons is an internal interpretation that would show the explanatory relevance of characterizing these components as representations?

Considering two neuronal structures N and N' , and supposing that N and N' are components of different intentional icons, to be processed as components that correspond to it, N and N' must possess the physical characteristics that the alleged 'readers' mechanisms of intentional icons use as an indicator that these are components that correspond to it: have the same type, have a certain marker or be activated in a synchronized way.

If N and N' have these physical characteristics, they will be processed as components that correspond to it. However, since the properties relevant to the functioning of the 'readers' mechanisms are nothing more than physical properties, such processing can simply be seen as a sequence of causally connected events that contribute to the satisfaction of a particular function.

Admitting that this type of causal processing is a form of internal interpretation of representations is not enlightening, but quite the opposite,

since it forces to explain why speaking of interpretation would be relevant, since the 'readers' mechanisms only react to certain physical properties of N and N'. The notion of interpretation is no easy to integrate into the order of causal explanation, and this difficulty is but one example.

One possible objection to these reasoning would be to point out that the intentional icons are used in cognitive tasks whose conduction implies the ability to identify when an individual or property is being represented.

Therefore, a way of interpreting intentional icons that allows to identify when components correspond to the same thing would be required. However, identifying when an individual or property is being represented again is something that an organism, as such, is capable of doing. In no way does it help to assume the existence of internal processes of interpretation, if this is done only to project in the activity of the nervous system the possession of the capacity itself that was intended to explain.

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Second example

Based on the dual factor theory, formulated by Block(1986), that states that an internal representation is a neuronal structure whose content is at once determined by its causal connection to external properties or objects (which, by virtue of such connection it constitutes its extension) and because of the way it is used by specific cognitive mechanisms, Carey (2009) distinguishes several types of internal representations: sensitive, perceptual, basic cognition (core cognition representations) and conceptual.

All these, according to Carey, meet the requirements of two factor theory, as they are neural structures that, in addition to being causally connected with external properties or objects, are processed by certain cognitive mechanisms.

For Carey, a sensitive representation is the output of a sensory organ; for example, in the case of the eye, an image formed in the retina. Perceptual representations, on the other hand, represent concrete objects with stable properties, despite the enormous variability in the sensitive appearance of such objects, according to the conditions of the environment and the spatial relationship between the organism that perceives and the objects perceived.

The third type of representation, basic cognition, is a form of conceptual representation used in specialized tasks that imply, according to Carey, the use of information that cannot be obtained from simple sensitive or perceptive representations.

To illustrate its functioning, Carey (2009) presents the example of Indigo Tile, a migratory bird capable of identifying, in starry nights, the Earth's north. According to the experimental studies on which Carey is based, the indigo tile has innate mechanisms that allow it to detect, when still a chick, the rotation center of the starry sky. Since the apparent rotation of the starry sky is an effect of Earth's rotation on its own axis and the Earth's axis of rotation crosses the planet from north to south, detecting the rotation center of the starry sky allows identifying the northern direction of the planet (the indigo tile inhabits the northern hemisphere of the Earth).

For Carey, the indigo tile is capable of perceptively representing the starry sky with its center of rotation, but given the way its representations are employed by its navigation mechanisms, such representations cannot be considered simple perceptual representations. In particular, Carey (2009) states that the navigation mechanisms of the indigo tile are capable of 'inferring', from perceptual representations of the starry sky, the direction that this bird must follow in its migration process. The information extracted seems to exceed what is properly represented by the perceptual system of the indigo tile.

Thus, according to Carey, a perceptual representation that is used in specialized cognitive processes that are carried out by innate mechanisms such as the navigation mechanisms of the indigo tile, is a representation of basic cognition.

Finally, for Carey (2009), the representations of basic cognition, although they are conceptual representations informally superior to the perceptual representations, must be distinguished from the concepts employed in flexible processes of reasoning and theorizing, since the use given to those of basic cognition is limited, as noted above, to carry out specialized tasks carried out by innate mechanisms.

To get the explanatory irrelevance of the notion of internal representation that Carey uses, it should be noted that any neuronal structure that can be isolated in an organism's nervous system has more or less remote causal connections with external properties or objects, as well as effects inside the system.

Such a statement simply expresses the fact that there are connected causal flows in the nervous system of every organism with the outside world. Of course, the activity of the nervous system is not a mere causal flow, but a structured activity that explodes the nomological relationships between their internal events and the outside world in order to ful-

fill their functions. An example of this is the activity that makes possible the indigo tile to navigate.

Steven Emlen (1975), in his experimental studies, presents different groups of indigo tile chicks, raised in a planetarium, viewing starry sky with different rotation centers. During the critical learning period, as mentioned above, chicks record the observed rotation center so that, when migration arrives, the direction of flight is selected based on the location of that rotation center. Emlen's work shows that the nervous system of the indigo tile is able to exploit the nomological connections that exist between the stimulation of its internal structures, the apparent movement of the celestial vault and the terrestrial geography in order to satisfy a specific function: orientation in the migration process. At what point is it necessary, or useful, to explain this form of structured activity to postulate the existence of internal representations?

Certainly, the observation of the rotation center of the starry sky, during the critical period of learning, allows the indigo tile to calibrate its navigation mechanisms. But the functional connection between observation of the rotation center of the starry sky and selection of the direction of flight can be seen as a simple consolidation (thanks to innate mechanisms) of an internal causal connection.

Such consolidation does not require the delimitation of neural structures that can be characterized as representations. And although it was possible to delimit certain structures (or events) in the series of internal events and assign them the function of vehicles transmitting information, there would be no reason to assume that such structures (or events) are more than causal mediators that, by virtue of its nomological connections and its effects on the system, they contribute to satisfying the orientation function of the indigo tile.

If assuming, however, that the structures are genuine representations, these structures would not have explanatory relevance as representations, because the fact that these delimited structures are representations could be an effect without functional significance on the activity of the nervous system of the indigo tile, i.e., a simple epiphenomenon.

For Carey, the representations formed in the nervous system of an organism, particularly the representations of basic cognition, are processed by cognitive modules that produce new representations. In the case of indigo tile, according to Carey (2009), the innate cognitive module by which this bird manages to orient in its migration process admits representations of the starry sky as inputs and produces representations of the direction to follow as outputs. However, both the application of cognitive modules and the application of internal representations are nothing



more than a pure effect of the projection, in the activity of the nervous system, of the norms that regulate the capacity that is intended to explain.

Based on the fact that the indigo tile nervous system is capable of guiding this bird in its migration process, we must assume that the rules defining the proper exercise of this capacity must, in some way, regulate the activity of the system. Talking about representations of the starry sky processed by internal modules that 'infer' representations of the direction of flight to be followed is simply a way of recognizing that there must be an influence of such rules on the activity of the nervous system of the indigo tile, but by no means it is an explanation of how this influence is possible.

Conclusion

To conclude, the rejection of the application of internal representations does not oblige us to reject the evidence that Carey and her collaborators have obtained in favor of the existence of a basic and innate form of cognition. The application of internal representations and cognitive modules responsible for processing them is not properly supported by such evidence. It is merely a reflection of the use of RTM, whose central thesis is that the cognitive life of an organism is reduced to the formation, storage and processing of internal representations. The fact that the nervous system of an organism with cognitive abilities is a highly structured system and that such structuring is largely innate does not imply the existence of internal representations.

In general, the rejection of the notion of internal representation does not necessarily imply the rejection of the results obtained by the scientists of cognition, even by those who use this same notion. The notion of internal representation is incapable of satisfying the explanatory function assigned to it by RTM, but that does not mean that this notion cannot have any other function that can explain, to some extent, its widespread use.

As mentioned above, postulating the existence of internal representations is a (often implicit) way of recognizing that the processes of the nervous system that allow the conduction of cognitive tasks must be subjected to the rules that define the correct execution of such tasks. Assuming such a thing may be legitimate, although it must also be admitted that the application of internal representations does not explain the influence of such rules, but it is simply a way to recognize it. Explaining the nature of its influence and how exactly it occurs is not necessarily an obligation of cognitive scientists. Nor should it be thought, however, that the application of internal representations can solve these difficulties.

Notes

1. Strictly speaking, there is a third option: The causal power of an internal representation derives from both types of properties. This option, however, is not relevant here, as it does not affect the arguments that will be presented below.
2. Fodor and Pylyshyn (2015) even claim that there may be a better solution to this problem, but they do not know “any other” (p. 7). In short, the use of the expression “syntactic properties”, or “properties of the shape of a symbol”, to refer to the non-representational properties of a representation does not modify in any way its character as mere non-representational properties of a representation.
3. My translation.
4. My translation.
5. In this respect, we differ from Dretske (1981) when he states that “in the beginning there was information” (p. vii). In the beginning there was no information, as there were no actual signals or transmitting vehicles, but mere nomological relationships between structures, events or objects. Of course, there were potentially transmitting structures of information, i.e. structures that could have been exploited by systems or agencies with the required capabilities (if any).
6. Millikan (2017) even argues that it is apparently a “necessary” consequence of RTM that “one thing is identified when its signs are co-identified” (p. 51).

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Editorial guidelines / Normas editoriales

Publication guidelines in «Sophia»



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1. General Information

«Sophia» is a scientific publication of the *Salesian Polytechnic University of Ecuador*, published since January 2006 in an uninterrupted manner, with a fixed biannual periodicity, specialized in Philosophy of Education and its interdisciplinary lines such as Epistemology, Deontology, Aesthetics, Critical Studies, Hermeneutics, Axiology, Ontology, Philosophical Anthropology, Sociology, Philosophical Analytics, among others, all linked to the field of Education.

It is a scientific journal, which uses the peer-review system, under double-blind review methodology, according to the publication standards of the American Psychological Association (APA). Compliance with this system allows authors to guarantee an objective, impartial and transparent review process, which facilitates the publication of their inclusion in reference databases, repositories and international indexing.

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2. Scope and policy

2.1. Theme

Original contributions in Philosophy of Education, as well as related areas: Epistemology, Deontology, Aesthetics, Critical Studies, Hermeneutics, Axiology, Ontology, Philosophical Anthropology, Sociology, Philosophical Analytics,... and all interdisciplinary related disciplines with a philosophical reflection on education

2.2. Contributions

«Sophia» publishes critical studies, reports and proposals, as well as selected state-of-the-art literature reviews related to Philosophy of education. Accepting also results of empirical research on Education, written in Spanish and/or English.

The contributions can be:

- **Reviews:** 10,000 to 11,000 words of text, including charts and references. Justified references would be specially valued. (current and selected from among 70 works)
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- Address issues that respond to current problems and needs
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- Use adequate, clear, precise and comprehensible language
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For those works that are empirical investigations, the manuscripts will follow the IMRDC structure, being optional the Notes and Supports. Those papers that, on the contrary, deal with reports, studies, proposals and reviews may be more flexible in their epigraphs, particularly in material and methods, analysis, results, discussion and conclusions. In all typologies of works, references are mandatory.

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7) Analysis and results: It will try to highlight the most important observations, describing them, without making value judgments, the material and methods used. They will appear in a logical sequence in the text and the essential charts and figures avoiding the duplication of data.

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numbers of notes are placed in superscript, both in the text and in the final note. The numbers of notes are placed in superscript, both in the text and in the final note. No notes are allowed that collect simple bibliographic citations (without comments), as these should go in the references.

11) References: Bibliographical citations should be reviewed in the form of references to the text. Under no circumstances should references not mentioned in the text be included. Their number should be sufficient to contextualize the theoretical framework with current and important criteria. They will be presented alphabetically by the first last name of the author.

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Literature reviews are based on the analysis of major publications on a given topic; Its objective is to define the current state of the problem and to evaluate the investigations carried out. Its structure responds to the phases of the theme/ problem, contributions of researchers or teams, changes in theory or main theoretical currents; unsolved problems; current and future trends (Giordanino, 2011). According to UNESCO, this type of work is also known as “recapitulative studies”

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2) Identification data: Of each of the authors, organized by priority. A maximum of 3 authors will be accepted per original, although there may be exceptions justified by the topic, its complexity and extent. Next to the names must follow the professional category, work center, email of each author and complete ORCID number. Aspects that must be included in the Cover Letter, must also be uploaded to the OJS system of the journal, in the Metadata section and /or in a word document attached to the file containing the work proposed for the evaluation.

3) Abstract (Spanish) / Abstract (English): It will have a minimum length of 210 and a maximum of 220 words in Spanish; and 200 and maximum 210 words in English. The abstract will describe concisely and in this order: 1) Justification of the topic; 2) Objectives; 3) Methodology; 4) Main results; 5) Main conclusions. It must be impersonally written “This paper analyzes...” In the case of the abstract, the use of automatic translators will not be accepted due to their poor quality.

4) Keywords (Spanish) / Keywords (English): A maximum of 6 keywords must be presented for each language version directly related to the subject of the work. The use of the key words set out in UNESCO’s Thesaurus and of the Journal itself will be positively valued.

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6) Body or development of the document: It implies putting into practice throughout the text, a critical attitude that should tend towards the interpellation, in order to attract the attention of the topic and the problem treated. The writer must generate in the reader the capacity to identify the dialogical intention of the proposal and to promote an open discussion.

7) Conclusions: Objectively state the results and findings. Offer a vision of the implications of the work, the limitations, the tentative response to the problem, the relations with the objective of the research and the possible lines of continuity (to fulfill this objective it is suggested not to include all the results obtained in the research). The conclusions should be duly justified according to the research carried out. The conclusions may be associated with the recommendations, evaluations, applications, suggestions, new relations and accepted or rejected hypotheses.

8) Bibliography: It is the set of works used in the structuring of the scientific text. It should include only the reference of the works used in the research. Bibliographical references should be ordered alphabetically and conform to the international APA standards, in their sixth edition.

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3.2. Guidelines for references

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Journal Article (Up to six authors): Ospina, M.C., Alvarado, S.V., Fefferman, M., & Llanos, D. (2016). Introducción del dossier temático “Infancias y juventudes: violencias, conflictos, memorias y procesos de construcción de paz” [Introduction of the thematic dossier “Infancy and Youth: Violence, Conflicts, Memories and Peace Construction Processes”]. *Universitas*, 25(14), 91-95. <https://doi.org/10.17163/uni.n25.%25x>

Journal article (more than six authors): Smith, S.W., Smith, S.L. Pieper, K.M., Yoo, J.H., Ferrys, A.L., Downs, E.,... Bowden, B. (2006). Altruism on American Television: Examining the Amount of, and Context Surrounding. *Acts of Helping and Sharing. Journal of Communication*, 56(4), 707-727. <https://doi.org/10.1111/j.1460-2466.2006.00316.x>

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DIGITAL MEDIA

Pérez-Rodríguez, M.A., Ramírez, A., & García-Ruíz, R. (2015). La competencia mediática en educación infantil. *Análisis del nivel de desarrollo en España*. *Universitas Psychologica*, 14(2), 619-630. <https://doi.org.10.11144/Javeriana.upsy14-2.cmei>

It is prescriptive that all quotations that have DOI (Digital Object Identifier System) are reflected in the References (can be obtained at <http://goo.gl/gfruh1>). All journals and books that do not have DOI should appear with their respective link (in their online version, if they have it, shortened by Bitly: <https://bitly.com/>) and date of consultation in the indicated format.

Journal articles should be presented in English, except for those in Spanish and English, in which case it will be displayed in both languages using brackets. All web addresses submitted must be shortened in the manuscript, except for the DOI that must be in the indicated format (<https://doi.org/XXX>).

3.3. Epigraphs, Figures and Charts

The epigraphs of the body of the article will be numbered in Arabic. They should go without a full box of capital letters, neither underlined nor bold. The numbering must be a maximum of three levels: 1. / 1.1. / 1.1.1. A carriage return will be established at the end of each numbered epigraph.

The charts must be included in the text in Word format according to order of appearance, numbered in Arabic and subtitled with the description of the content.

The graphics or figures will be adjusted to the minimum number required and will be presented incorporated in the text, according to their order of appearance, numbered in Arabic and subtitled with the abbreviated description. Their quality should not be less than 300 dpi, and it may be necessary to have the graph in TIFF, PNG or JPEG format.

4. Submission Process

The receipt of articles is permanent, however, considering that the publication of the Sophia Journal is bi-annual, the manuscripts must be sent at least one period before the date stipulated in the corresponding Call.

The manuscripts must be sent through the OJS (Open Journal System) system of the journal, for which it is necessary that the author previously registers in



the respective space (enter in the following link: <http://sophia.ups.edu.ec/index.php/sophia/user/register>, complete the form and follow each of the suggested steps).

The two documents that must be sent are:

1) Presentation and cover (Use official model), which will appear:

Title. In Spanish in the first line, in letter Arial 14, with bold and centered, with a maximum of 85 characters with space. In English in the second line, in letter Arial 14, in italics and bold.

Full names and surnames of the authors. Organized in order of priority, a maximum of 3 authors are accepted per original, although there may be exceptions justified by the topic, its complexity and extent. Each name must include the name of the institution in which he/she works as well as the city, country, email and ORCID number.

Abstract (Spanish) It will have a minimum length of 210 and a maximum of 220 words. It must include 1) Justification of the topic; 2) Objectives; 3) Methodology; 4) Main results; 5) Main conclusions. It must be impersonally written "The present paper analyzes..."

Abstract. Summary with all its components, translated into English and in cursive. Do not use automatic translation systems.

Keywords (Spanish): 6 standardized terms preferably of a single word and of the UNESCO and the Journal's Thesaurus separated by commas (,).

Keywords. The 6 terms above translated into English and separated by comma (,). Do not use automatic translation systems.

In addition, a statement must be included (using a template called: Presentation) in which it is explained that the submitted manuscript is an original contribution, not sent or being evaluated in another journal, confirmation of the signatory authors, acceptance (if applicable) of formal changes in the manuscript according to the norms and partial transfer of rights to the publisher. This document must be signed and recorded through the OJS system, in the section: "Complementary files".

2) Manuscript totally anonymized, according to the guidelines referred in precedence.

All authors must register with their credits on the OJS platform, although only one of them will be responsible for correspondence. No author can submit or have in review two manuscripts simultaneously, estimating an absence of four consecutive numbers (2 years).

5. Publication interval

The interval between receipt and publication of an article is 7 months (210 days).



Normas de Publicación en «Sophia»



ISSN: 1390-3861 / e-ISSN: 1390-8626

1. Información general

«Sophia» es una publicación científica de la Universidad Politécnica Salesiana de Ecuador, editada desde junio de 2006 de forma ininterrumpida, con periodicidad fija semestral, especializada en Filosofía de la Educación y sus líneas interdisciplinarias como Epistemología, Deontología, Estética, Estudios Críticos, Hermenéutica, Axiología, Ontología, Antropología Filosófica, Sociología, Analítica Filosófica... vinculadas al ámbito de la educación.

Es una revista científica arbitrada, que utiliza el sistema de evaluación externa por expertos (*peer-review*), bajo metodología de pares ciegos (*double-blind review*), conforme a las normas de publicación de la American Psychological Association (APA). El cumplimiento de este sistema permite garantizar a los autores un proceso de revisión objetivo, imparcial y transparente, lo que facilita a la publicación su inclusión en bases de datos, repositorios e indexaciones internacionales de referencia.

«Sophia» se encuentra indexada en Emerging Sources Citation Index (ESCI) de Web of Science; en Scientific Electronic Library Online (SciELO); en el Sistema de Información Científica (REDALYC); en el directorio y catálogo selectivo del Sistema Regional de Información en Línea para Revistas Científicas de América Latina, el Caribe, España y Portugal (LATINDEX), en la Matriz de Información para el Análisis de Revistas (MIAR), en Clasificación Integrada de Revistas Científicas (C.I.R.C), en Academic Resource Index (Research Bible), en la Red Iberoamericana de Innovación y Conocimiento Científico (REDIB), en el Portal de difusión de la producción científica (Dialnet); en Bibliografía Latinoamericana en Revistas de Investigación Científica y Social (BIBLAT); en el Directorio de Revistas de Acceso Abierto DOAJ y en repositorios, bibliotecas y catálogos especializados de Iberoamérica.

La revista se edita en doble versión: impresa (ISSN: 1390-3861) y electrónica (e-ISSN: 1390-8626), en español y en inglés, siendo identificado además cada trabajo con un DOI (Digital Object Identifier System).

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2. Alcance y política

2.1. Temática

Contribuciones originales en materia de Filosofía de la Educación, así como áreas afines: Epistemología, Deontología, Estética, Estudios Críticos, Hermenéutica, Axiología, Ontología, Antropología Filosófica, Sociología, Analítica Filosófica,... y todas aquellas disciplinas conexas interdisciplinarmente con una reflexión filosófica sobre la educación.

2.2. Aportaciones

«Sophia» edita estudios críticos, informes, propuestas, así como selectas revisiones de la literatura (*state-of-the-art*) en relación con la Filosofía de la Educación, aceptando asimismo trabajos de investigación empírica, redactados en español y en inglés.

Las aportaciones en la revista pueden ser:

- **Revisiones:** 10.000 a 11.000 palabras de texto, incluidas tablas y referencias. Se valorará especialmente las referencias justificadas, actuales y selectivas de alrededor de unas 70 obras.
- **Investigaciones:** 8.000 a 9.500 palabras de texto, incluyendo título, resúmenes, descriptores, tablas y referencias.
- **Informes, estudios y propuestas:** 8.000 a 9.500 palabras de texto, incluyendo título, resúmenes, tablas y referencias.

2.3. Características del contenido

Todos los trabajos presentados para la publicación en «Sophia» deberán cumplir con las características propias de una investigación científica:

- Ser originales, inéditos y relevantes
- Abordar temáticas que respondan a problemáticas y necesidades actuales
- Aportar para el desarrollo del conocimiento científico en el campo de la Filosofía de la Educación y sus áreas afines
- Utilizar un lenguaje adecuado, claro, preciso y comprensible
- No haber sido publicados en ningún medio ni estar en proceso de arbitraje o publicación.

Dependiendo de la relevancia y pertinencia del artículo, se considerarán como contribuciones especiales y ocasionalmente se publicarán:

- Trabajos que superen la extensión manifestada
- Trabajos que no se correspondan con el tema objeto de la reflexión prevista para el número respectivo

2.4 Periodicidad



«Sophia» tiene periodicidad semestral (20 artículos por año), publicada en los meses de enero y julio; y cuenta por número con dos secciones de cinco artículos cada una, la primera referida a un tema **Monográfico** preparado con antelación y con editores temáticos; la segunda, una sección de **Misceláneas**, compuesta por aportaciones variadas dentro de la temática de la publicación.

3. Presentación, estructura y envío de los manuscritos

Los trabajos se presentarán en tipo de letra Arial 12, interlineado simple, justificado completo y sin tabuladores ni espacios en blanco entre párrafos. Se separarán con un espacio en blanco los grandes bloques (título, autores, resúmenes, descriptores, créditos y epígrafes). La página debe tener 2 centímetros en todos sus márgenes.

Los trabajos deben presentarse en documento de Microsoft Word (.doc o .docx), siendo necesario que el archivo esté anonimizado en Propiedades de Archivo, de forma que no aparezca la identificación de autor/es.

Los manuscritos deben ser enviados única y exclusivamente a través del OJS (Open Journal System), en el cual todos los autores deben darse de alta previamente. No se aceptan originales enviados a través de correo electrónico u otra interfaz.



3.1. Estructura del manuscrito

Para aquellos trabajos que se traten de investigaciones de carácter empírico, los manuscritos seguirán la estructura IMRDC, siendo opcionales los epígrafes de Notas y Apoyos. Aquellos trabajos que por el contrario se traten de informes, estudios, propuestas y revisiones sistemáticas podrán ser más flexibles en sus epígrafes, especialmente en Material y métodos; Análisis y resultados; Discusión y conclusiones. En todas las tipologías de trabajos son obligatorias las Referencias.

A. INVESTIGACIONES EMPÍRICAS

Su objetivo es contribuir al progreso del conocimiento mediante información original, sigue la estructura IMRDC: Introducción (objetivos, literatura previa), Materiales y métodos; Análisis y Resultados; Discusión, integración y conclusiones. Siguiendo los criterios planteados por la Unesco, es este tipo de textos científicos se llaman también como: “memorias originales”

La estructura recomendada, especialmente en trabajos que incluyen investigaciones empíricas, es la siguiente:

1) **Título (español) / Title (inglés):** Conciso pero informativo, en castellano en primera línea y en inglés en segunda. Se aceptan como máximo 85 caracteres con espacio. El título no solo es responsabilidad de los autores, pudiéndose proponer cambios por parte del Consejo Editorial.

2) **Datos de Identificación:** Nombres y apellidos completos de cada uno de los autores, organizados por orden de prelación. Se aceptarán como máxi-

mo 3 autores por original, aunque pudieren existir excepciones justificadas por el tema, su complejidad y extensión. Junto a los nombres deberá incluirse, el nombre de la institución en la que trabaja así como la ciudad, el país, el correo electrónico y número completo de ORCID de cada autor aspectos que deberán constar de modo obligatorio en la Carta de Presentación, además deberán ser cargados en el sistema OJS de la revista, en la sección Metadatos y/o en un documento word adjunto al archivo que contiene el trabajo que se propone para la evaluación.

3) Resumen (español) / Abstract (inglés): Tendrá como extensión mínima de 210 y máxima de 220 palabras en español; y de 200 y máximo de 210 palabras en inglés. El resumen describirá de forma concisa y en este orden: 1) Justificación del tema; 2) Objetivos; 3) Metodología y muestra; 4) Principales resultados; 5) Principales conclusiones. Ha de estar escrito de manera impersonal “El presente trabajo analiza...”. En el caso del abstract no se admitirá el empleo de traductores automáticos por su pésima calidad.

4) Descriptores (español) / Keywords (inglés): Se deben exponer máximo 6 términos por cada versión idiomática relacionados directamente con el tema del trabajo. Será valorado positivamente el uso de las palabras claves expuestas en el Thesaurus de la UNESCO y en el de la propia revista localizado en el siguiente enlace: https://sophia.ups.edu.ec/tesauro_sophia.php

5) Introducción y estado de la cuestión: Debe incluir el planteamiento del problema, el contexto de la problemática, la justificación, fundamentos y propósito del estudio, utilizando citas bibliográficas, así como la literatura más significativa y actual del tema a escala nacional e internacional.

6) Material y métodos: Debe ser redactado de forma que el lector pueda comprender con facilidad el desarrollo de la investigación. En su caso, describirá la metodología, la muestra y la forma de muestreo, así como se hará referencia al tipo de análisis estadístico empleado. Si se trata de una metodología original, es necesario exponer las razones que han conducido a su empleo y describir sus posibles limitaciones.

7) Análisis y resultados: Se procurará resaltar las observaciones más importantes, describiéndose, sin hacer juicios de valor, el material y métodos empleados. Aparecerán en una secuencia lógica en el texto y las tablas y figuras imprescindibles evitando la duplicidad de datos.

8) Discusión y conclusiones: Resumirá los hallazgos más importantes, relacionando las propias observaciones con estudios de interés, señalando aportaciones y limitaciones, sin redundar datos ya comentados en otros apartados. Asimismo, el apartado de discusión y conclusiones debe incluir las deducciones y líneas para futuras investigaciones.

9) Apoyos y agradecimientos (opcionales): El Council Science Editors recomienda a los autor/es especificar la fuente de financiación de la investigación. Se considerarán prioritarios los trabajos con aval de proyectos competitivos nacionales e internacionales. En todo caso, para la valoración científica del manuscrito, este debe ir anonimizado con XXXX solo para su evaluación ini-



cial, a fin de no identificar autores y equipos de investigación, que deben ser explicitados en la Carta de Presentación y posteriormente en el manuscrito final.

10) Las notas (opcionales) irán, solo en caso necesario, al final del artículo (antes de las referencias). Deben anotarse manualmente, ya que el sistema de notas al pie o al final de Word no es reconocido por los sistemas de maquetación. Los números de notas se colocan en superíndice, tanto en el texto como en la nota final. No se permiten notas que recojan citas bibliográficas simples (sin comentarios), pues éstas deben ir en las referencias.

11) Referencias: Las citas bibliográficas deben reseñarse en forma de referencias al texto. Bajo ningún caso deben incluirse referencias no citadas en el texto. Su número debe ser suficiente para contextualizar el marco teórico con criterios de actualidad e importancia. Se presentarán alfabéticamente por el primer apellido del autor.

B. REVISIONES

Las revisiones de literatura se basan en el análisis de las principales publicaciones sobre un tema determinado; su objetivo es definir el estado actual del problema y evaluar las investigaciones realizadas. Su estructura responde a las fases del tema/problema, aportes de investigadores o equipos, cambios en la teoría o las corrientes teóricas principales; problemas sin resolver; tendencias actuales y futuras (Giordanino, 2011). De acuerdo con la UNESCO, este tipo de trabajos se conocen también como: “estudios recapitulativos”

1) Título (español) / Title (inglés): El título del artículo deberá ser breve, interesante, claro, preciso y atractivo para despertar el interés del lector. Conciso pero informativo, en castellano en la primera línea y en inglés en la segunda línea. Se aceptan como máximo 85 caracteres con espacio. El título no solo es responsabilidad de los autores, también los Miembros del Consejo Editorial puede proponer cambios al título del documento.

2) Datos de Identificación: Nombres y apellidos completos de cada uno de los autores, organizados por orden de prelación. Se aceptarán como máximo 3 autores por original, aunque pudieren existir excepciones justificadas por el tema, su complejidad y extensión. Junto a los nombres deberá incluirse, el nombre de la institución en la que trabaja así como la ciudad, el país, el correo electrónico y número completo de ORCID de cada autor aspectos que deberán constar de modo obligatorio en la Carta de Presentación, además deberán ser cargados en el sistema OJS de la revista, en la sección Metadatos y/o en un documento word adjunto al archivo que contiene el trabajo que se propone para la evaluación.

3) Resumen (español) / Abstract (inglés): Tendrá como extensión mínima de 210 y máxima de 220 palabras en español; y de 200 y máximo de 210 palabras en inglés. El resumen describirá de forma concisa y en este orden: 1) Justificación del tema; 2) Objetivos; 3) Metodología; 4) Principales resultados; 5) Principales conclusiones. Ha de estar escrito de manera impersonal “El presente trabajo ana-



liza...”. En el caso del abstract no se admitirá el empleo de traductores automáticos por su pésima calidad.

4) Descriptores (español) / Keywords (inglés): Se deben exponer máximo 6 términos por cada versión idiomática relacionados directamente con el tema del trabajo. Será valorado positivamente el uso de las palabras claves expuestas en el Thesaurus de la UNESCO y en el de la propia revista.

5) Introducción: Deberá incluir una presentación breve del tema, la formulación del propósito u objetivo del estudio, el contexto de la problemática y la formulación del problema que se propone enfrentar, la presentación de la idea a defender, la justificación que explica la importancia, la actualidad y la pertinencia del estudio; el marco metodológico utilizado, y finalmente, una breve descripción de la estructura del documento. En la justificación es necesario utilizar citas bibliográficas así como la literatura más significativa y actual del tema a escala nacional e internacional.

6) Cuerpo o desarrollo del documento: Implica poner en práctica a lo largo de toda la exposición, una actitud crítica que deberá tender hacia la interpelación, a efectos de concitar la atención del tema y el problema tratados. El escritor deberá generar en el lector la capacidad de identificar la intención dialógica de la propuesta y propiciar en él una discusión abierta.

7) Conclusiones: Expone de manera objetiva los resultados y hallazgos; ofrece una visión de las implicaciones del trabajo, las limitaciones, la respuesta tentativa al problema, las relaciones con el objetivo de la investigación y las posibles líneas de continuidad (para cumplir con este objetivo se sugiere no incluir todos los resultados obtenidos en la investigación). Las conclusiones deberán ser debidamente justificadas de acuerdo con la investigación realizada. Las conclusiones podrán estar asociadas con las recomendaciones, evaluaciones, aplicaciones, sugerencias, nuevas relaciones e hipótesis aceptadas o rechazadas.

8) Bibliografía: Es el conjunto de obras utilizadas en la estructuración del texto científico. Deberá incluir únicamente la referencia de los trabajos utilizados en la investigación. Las referencias bibliográficas deberán ordenarse alfabéticamente y ajustarse a las normas internacionales APA, en su sexta edición.

3.2. Normas para las referencias

PUBLICACIONES PERIÓDICAS

Artículo de revista (un autor): Valdés-Pérez, D. (2016). Incidencia de las técnicas de gestión en la mejora de decisiones administrativas [Impact of Management Techniques on the Improvement of Administrative Decisions]. *Retos*, 12(6), 199-2013. <https://doi.org/10.17163/ret.n12.2016.05>

Artículo de revista (hasta seis autores): Ospina, M.C., Alvarado, S.V., Fefferman, M., & Llanos, D. (2016). Introducción del dossier temático “Infancias y juventudes: violencias, conflictos, memorias y procesos de construcción de paz” [Introduction of the thematic dossier “Infancy and Youth: Violence, Con-



flicts, Memories and Peace Construction Processes”]. *Universitas*, 25(14), 91-95. <https://doi.org/10.17163/uni.n25.%25x>

Artículo de revista (más de seis autores): Smith, S.W., Smith, S.L. Pieper, K.M., Yoo, J.H., Ferrys, A.L., Downs, E.,... Bowden, B. (2006). Altruism on American Television: Examining the Amount of, and Context Surrounding, Acts of Helping and Sharing. *Journal of Communication*, 56(4), 707-727. <https://doi.org/10.1111/j.1460-2466.2006.00316.x>

Artículo de revista (sin DOI): Rodríguez, A. (2007). Desde la promoción de salud mental hacia la promoción de salud: La concepción de lo comunitario en la implementación de proyectos sociales. *Alteridad*, 2(1), 28-40. (<https://goo.gl/zDb3Me>) (2017-01-29).

LIBROS Y CAPÍTULOS DE LIBRO

Libros completos: Cuéllar, J.C., & Moncada-Paredes, M.C. (2014). *El peso de la deuda externa ecuatoriana*. Quito: Abya-Yala.

Capítulos de libro: Zambrano-Quiñones, D. (2015). *El ecoturismo comunitario en Manglaralto y Colonche*. En V.H. Torres (Ed.), *Alternativas de Vida: Trece experiencias de desarrollo endógeno en Ecuador* (pp. 175-198). Quito: Abya-Yala.



MEDIOS ELECTRÓNICOS

Pérez-Rodríguez, M.A., Ramírez, A., & García-Ruíz, R. (2015). La competencia mediática en educación infantil. Análisis del nivel de desarrollo en España. *Universitas Psychologica*, 14(2), 619-630. <https://doi.org.10.11144/Javeriana.upsy14-2.cmei>

Es prescriptivo que todas las citas que cuenten con DOI (Digital Object Identifier System) estén reflejadas en las Referencias (pueden obtenerse en <http://goo.gl/gfruh1>). Todas las revistas y libros que no tengan DOI deben aparecer con su link (en su versión on-line, en caso de que la tengan, acortada, mediante Bitly: <https://bitly.com/> y fecha de consulta en el formato indicado.

Los artículos de revistas deben ser expuestos en idioma inglés, a excepción de aquellos que se encuentren en español e inglés, caso en el que se pondrá en ambos idiomas utilizando corchetes. Todas las direcciones web que se presenten tienen que ser acortadas en el manuscrito, a excepción de los DOI que deben ir en el formato indicado (<https://doi.org/XXX>).

3.3. Epígrafes, tablas y gráficos

Los epígrafes del cuerpo del artículo se numerarán en arábigo. Irán sin caja completa de mayúsculas, ni subrayados, ni negritas. La numeración ha de ser como máximo de tres niveles: 1. / 1.1. / 1.1.1. Al final de cada epígrafe numerado se establecerá un retorno de carro.

Las tablas deben presentarse incluidas en el texto en formato Word según orden de aparición, numeradas en arábigo y subtituladas con la descripción del contenido.

Los gráficos o figuras se ajustarán al número mínimo necesario y se presentarán incorporadas al texto, según su orden de aparición, numeradas en arábigo y subtituladas con la descripción abreviada. Su calidad no debe ser inferior a 300 ppp, pudiendo ser necesario contar con el gráfico en formato TIFF, PNG o JPEG.

4. Proceso de envío

La recepción de artículos es permanente, sin embargo, considerando que la publicación de la Revista Sophia es semestral, el envío de los manuscritos deberá efectuarse al menos un período antes de la fecha estipulada en la Convocatoria correspondiente.

Los manuscritos deberán remitirse a través del sistema OJS (Open Journal System) de la revista, para lo cual es necesario que el autor se registre previamente en el espacio respectivo (ingrese en el siguiente link: <http://sophia.ups.edu.ec/index.php/sophia/user/register>, complemente el formulario y siga cada uno de los pasos que se sugieren).

Los dos documentos que deben ser enviados son:

1) **Carta de presentación o Cover letter** (usar modelo oficial), en la que aparecerán:

Título. En castellano en la primera línea, en letra Arial 14, con negrita y centrado, con un máximo de 85 caracteres con espacio. En inglés en la segunda línea, en letra Arial 14, en cursiva y con negrita.

Nombres y apellidos completos de los autores. Organizados por orden de prelación, se aceptan como máximo 3 autores por original, aunque pudieren existir excepciones justificadas por el tema, su complejidad y extensión. Junto a cada uno de los nombres deberá incluirse, el nombre de la institución en la que trabaja así como la ciudad, el país, el correo electrónico y número de ORCID.

Resumen. Tendrá como extensión mínima 210 y máxima 220 palabras. El resumen describirá de forma concisa y en este orden: 1) Justificación del tema; 2) Objetivos; 3) Metodología; 4) Principales resultados; 5) Principales conclusiones. Ha de estar escrito de manera impersonal “El presente trabajo analiza...”.

Abstract. Resumen con todos sus componentes, traducido al inglés y en letra cursiva. No utilizar sistemas de traducción automáticos.

Descriptor. Máximo 6 términos estandarizados preferiblemente de una sola palabra y del Thesaurus de la UNESCO y de la propia revista, separados por coma (,).

Keywords. Los 6 términos antes referidos traducidos al inglés y separados por coma (,). No utilizar sistemas de traducción automáticos.

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Además, se deberá incluir una: **Declaración** (usar modelo denominado: Presentación) en la que se explica que el manuscrito enviado es una aportación original, no enviado ni en proceso de evaluación en otra revista, confirmación de las autorías firmantes, aceptación (si procede) de cambios formales en el manuscrito conforme a las normas y cesión parcial de derechos a la editorial. Este documento deberá ser firmado y consignado a través del sistema OJS, en la sección: “**Ficheros complementarios**”.

2) **Manuscrito** totalmente anonimizado, conforme a las normas referidas en precedencia.

Todos los autores han de darse de alta, con sus créditos, en la plataforma OJS, si bien uno solo de ellos será el responsable de correspondencia. Ningún autor podrá enviar o tener en revisión dos manuscritos de forma simultánea, estimándose una carencia de cuatro números consecutivos (2 años).

5. Intervalo de publicación

(El tamaño y estilo de la letra tal como se encuentra el numeral 4 (Proceso de envío)

El intervalo comprendido entre la recepción y la publicación de un artículo es de 7 meses (210 días).



Indications for External Reviewers of «Sophia»

The **Board of External Reviewers of «Sophia»** is an independent collegiate body whose purpose is to guarantee the excellence of this scientific publication, because the blind evaluation - based exclusively on the quality of the contents of the manuscripts and carried out by experts of recognized International prestige in the field - is, without a doubt, the best guarantee for the advancement of science and to preserve in this header an original and valuable scientific production.

To this end, the **Board of External Reviewers** is made up of several scholars and international scientists specialized in **Education**, essential to select the articles of the greatest impact and interest for the international scientific community. This in turn allows that all the articles selected to publish in «**Sophia**» have an academic endorsement and objectifiable reports on the originals.

Of course, all reviews in «**Sophia**» use the internationally standardized system of double-blind peer evaluation that guarantees the anonymity of manuscripts and reviewers. As a measure of transparency, the complete lists of reviewers are published on the official website of the journal <http://Sophia.ups.edu.ec/>)

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1. Criteria for acceptance/rejection of manuscript evaluation

The editorial team of «**Sophia**» selects those that are considered more qualified in the subject of the manuscript from the list of reviewers of the Board of Reviewers. While the publication requires the maximum collaboration of reviewers to expedite the evaluations and reports on each original, acceptance of the review must be linked to:

- a. **Expertise.** Acceptance necessarily entails the possession of competences in the specific theme of the article to be evaluated.
- b. **Availability.** Reviewing an original takes time and involves careful reflection on many aspects.
- c. **Conflict of interests.** In case of identification of the authorship of the manuscript (despite their anonymity), excessive academic or family closeness to their authors, membership in the same University, Department, Research Group, Thematic Network, Research Projects, joint publications with authors... or any other type of connection or conflict / professional proximity; The reviewer must reject the publisher's invitation for review.
- d. **Commitment of confidentiality.** Reception of a manuscript for evaluation requires the Reviewer to express a commitment of confidentiality, so that it cannot be divulged to a third party throughout the process.

In the event that the reviewer cannot carry out the activity for some of these reasons or other justifiable reasons, he/she must notify the publisher by the same route that he/she has received the invitation, specifying the reasons for rejection.

2. General criteria for the evaluation of manuscripts

a) Topic

In addition to being valuable and relevant to the scientific community, the topic that is presented in the original must be limited and specialized in time and space, without excessive localism.

b) Redaction

The critical assessment in the review report must be objectively written, providing content, quotes or references of interest to support its judgment.

c) Originality

As a fundamental criterion of quality, an article must be original, unpublished and suitable. In this sense, reviewers should answer these three questions in the evaluation:

- Is the article sufficiently novel and interesting to justify publication?
- Does it contribute anything to the knowledge canon?
- Is the research question relevant?

A quick literature search using repositories such as Web of Knowledge, Scopus and Google Scholar to see if the research has been previously covered, may be helpful.

d) Structure

Manuscripts that refer to «Sophia» must follow the IMRDC structure, except those that are literature reviews or specific studies. In this sense, the originals must contain summary, introduction, methodology, results, discussion and conclusion.

- The **title, abstract, and keywords** should accurately describe the content of the article.
- The **review of the literature** should summarize the state of the question of the most recent and adequate research for the presented work. It will be especially evaluated with criteria of suitability and that the references are to works of high impact - especially in



WoS, Scopus, Scielo, etc. It should also include the general explanation of the study, its central objective and the followed methodological design.

- In case of research, in the **materials and methods**, the author must specify how the data, the process and the instruments used to respond to the hypothesis, the validation system, and all the information necessary to replicate the study are collected.
- **Results** must be clearly specified in logical sequence. It is important to check if the figures or charts presented are necessary or, if not, redundant with the content of the text.
- In the **discussion**, the data obtained should be interpreted in the light of the literature review. Authors should include here if their article supports or contradicts previous theories. The conclusions will summarize the advances that the research presents in the area of scientific knowledge, the future lines of research and the main difficulties or limitations for carrying out the research.
- **Language:** It will be positively assessed if the language used facilitates reading and is in favor of the clarity, simplicity, precision and transparency of the scientific language. The Reviewer should not proceed to correction, either in Spanish or English, but will inform the Editors of these grammatical or orthographical and typographical errors.
- Finally, a thorough **review of the references** is required in case any relevant work has been omitted. The references must be precise, citing within the logic of the subject at study, its main works as well as the documents that most resemble the work itself, as well as the latest research in the area.

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3. Relevant valuation dimensions

For the case of empirical research articles, «**Sophia**» uses an evaluation matrix of each original that responds to the editorial criteria and to compliance with the publication guidelines. In this sense, the reviewers must attend to the qualitative-quantitative assessment of each of the aspects proposed in this matrix with criteria of objectivity, reasoning, logic and expertise.

If the original is a review of the literature (status of the matter) or other type of study (reports, proposals, experiences, among others), the Editorial Board will send to the reviewers a different matrix, including the characteristics of Structure of this type of originals:

STUDIES, REPORTS, PROPOSALS AND REVIEW	
Valuable items	Score
01. Relevancy of the title (clarity, precision and with a maximum of 85 characters).	0/5
02. They summarize (In an alone paragraph and without epigraphs, minimum / minimal: 210-220 words).	0/5
03. Introduction (brief presentation of the topic; formulation of the problem; it designs to defending or hypothesis to demonstrating; I target; importance of the topic; current importance; methodology; structure of the document).	0/5
04. Review of the bibliographical foundation (Beside using current bibliography to consider the incorporation of Sophia's documents).	0/10
05. Structure and organization of the article (argumentative capabilities, coherence and scientific redaction).	0/10
06. Original contributions and contextualized analyses.	0/5
07. Conclusions that answer to the topic, to the problem and to the raised aim.	0/5
08. Citations and references of agreement to the regulation and to the format requested by the magazine (Any document and author who consists in the section of bibliography must consist in the body of story and vice versa).	0/5
Maximun total	50 points

RESEARCHES	
Valuable items	Score
01. Relevancy of the title (clarity, precision and with a maximum of 85 characters).	0/5
02. They summarize (In an alone paragraph and without epigraphs, minimum / minimal: 210-220 words).	0/5
03. Introduction (brief presentation of the topic; formulation of the problem; it designs to defending or hypothesis to demonstrating; I target; importance of the topic; current importance; methodology; structure of the document).	0/5
04. Review of the bibliographical foundation (Beside using current bibliography to consider the incorporation of Sophia's documents). Methodological rigorous and presentation of instruments of investigation.	0/10
05. Structure and organization of the article (argumentative capabilities, coherence and scientific redaction). Analysis and results of investigation with logical sequence in the text. Presentation of tables and figures without duplicity of information.	0/10

06. Original contributions and contextualized analyses of the information.	0/5
07. Discussion, conclusions and advances that answer to the topic, to the problem and to the raised aim.	0/5
08. Citations and references of agreement to the regulation and to the format requested by the magazine (Any document and author who consists in the section of bibliography must consist in the body of story and vice versa).	0/5
Total	50 points

4. Ethical issues

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- a. **Plagiarism:** Although the journal uses plagiarism detection systems, if the reviewer suspects that an original is a substantial copy of another work, he must immediately inform the Editors citing the previous work in as much detail as possible.
- b. **Fraud:** If there is real or remote suspicion that the results in an article are false or fraudulent, it is necessary to inform them to the Editors.

5. Evaluation of the originals

After the quantitative-qualitative evaluation of the manuscript under review, the reviewer may make recommendations to improve the quality of the manuscript. However, the manuscript will be graded in three ways:

- a. **Rejection** due to detected deficiencies justified and reasoned with quantitative and qualitative assessment. The report should be longer if a score of less than 40 of the 50 possible points is obtained.
- b. **Acceptance without review**
- c. **Conditional acceptance** and therefore review (greater or lesser). In the latter case, it is necessary to clearly identify which review is necessary, listing the comments and even specifying paragraphs and pages suggesting modifications.

Indicaciones para revisores externos de «Sophia»

El **Consejo de Revisores Externos de «Sophia»** es un órgano colegiado independiente cuyo fin es garantizar la excelencia de esta publicación científica, debido a que la evaluación ciega —basada exclusivamente en la calidad de los contenidos de los manuscritos y realizada por expertos de reconocido prestigio internacional en la materia— es la mejor garantía y, sin duda, el mejor aval para el avance de la ciencia y para preservar en esta cabecera una producción científica original y valiosa.

Para ello, el **Consejo de Revisores Externos** está conformado por diversos académicos y científicos internacionales especialistas en **Filosofía de la Educación**, esenciales para seleccionar los artículos de mayor impacto e interés para la comunidad científica internacional. Esto permite a su vez que todos los artículos seleccionados para publicar en «Sophia» cuenten con un aval académico e informes objetivables sobre los originales.

Por supuesto, todas las revisiones en «Sophia» emplean el sistema estandarizado internacionalmente de evaluación por pares con «doble ciego» (*double-blind*) que garantiza el anonimato de los manuscritos y de los revisores de los mismos. Como medida de transparencia, anualmente se hacen públicos en la web oficial de la revista ([www. http://Sophia.ups.edu.ec/](http://Sophia.ups.edu.ec/)) los listados completos de los revisores.



1. Criterios de aceptación/rechazo de evaluación manuscritos

El equipo editorial de «Sophia» selecciona del listado de evaluadores del Consejo de Revisores a aquellos que se estiman más cualificado en la temática del manuscrito. Si bien por parte de la publicación se pide la máxima colaboración de los revisores para agilizar las evaluaciones y los informes sobre cada original, la aceptación de la revisión ha de estar vinculada a:

- a. **Experticia.** La aceptación conlleva necesariamente la posesión de competencias en la temática concreta del artículo a evaluar.
- b. **Disponibilidad.** Revisar un original exige tiempo y conlleva reflexión concienzuda de muchos aspectos.
- c. **Conflicto de intereses.** En caso de identificación de la autoría del manuscrito (a pesar de su anonimato), excesiva cercanía académica o familiar a sus autores, pertenencia a la misma Universidad, Departamento, Grupo de Investigación, Red Temática, Proyectos de Investigación, publicaciones conjuntas con los autores... o cualquier otro tipo de conexión o conflicto/cercanía profesional; el revisor debe rechazar la invitación del editor para su revisión.
- d. **Compromiso de confidencialidad.** La recepción de un manuscrito para su evaluación exige del Revisor un compromiso expreso de

confidencialidad, de manera que éste no puede, durante todo el proceso, ser divulgado a un tercero.

En caso que el revisor no pueda llevar a cabo la actividad por algunos de estos motivos u otros justificables, debe notificarlo al editor por la misma vía que ha recibido la invitación, especificando los motivos de rechazo.

2. Criterios generales de evaluación de manuscritos

a) Tema

La temática que se plantea en el original, además de ser valiosa y relevante para la comunidad científica, ha de ser limitada y especializada en tiempo y espacio, sin llegar al excesivo localismo.

b) Redacción

La valoración crítica en el informe de revisión ha de estar redactada de forma objetiva, aportando contenido, citas o referencias de interés para argumentar su juicio.

c) Originalidad

Como criterio de calidad fundamental, un artículo debe ser original, inédito e idóneo. En este sentido, los revisores deben responder a estas tres preguntas en la evaluación:

- ¿Es el artículo suficientemente novedoso e interesante para justificar su publicación?
- ¿Aporta algo al canon del conocimiento?
- ¿Es relevante la pregunta de investigación?

Una búsqueda rápida de literatura utilizando repositorios tales como Web of Knowledge, Scopus y Google Scholar para ver si la investigación ha sido cubierta previamente puede ser de utilidad.

d) Estructura

Los manuscritos que se remiten a «**Sophia**» deben seguir la estructura señalada en las normas de publicación tanto para las investigaciones empíricas como para revisiones de la literatura o estudios específicos. En este sentido, los originales han de contener resumen, introducción, metodología, resultados, discusión y conclusión.

- El título, el resumen y las palabras clave han de describir exactamente el contenido del artículo.



- La revisión de la literatura debe resumir el estado de la cuestión de las investigaciones más recientes y adecuadas para el trabajo presentado. Se valorará especialmente con criterios de idoneidad y que las referencias sean a trabajos de alto impacto —especialmente en WoS, Scopus, Scielo, etc. Debe incluir además la explicación general del estudio, su objetivo central y el diseño metodológico seguido.
- En caso de investigaciones, en los materiales y métodos, el autor debe precisar cómo se recopilan los datos, el proceso y los instrumentos usados para responder a las hipótesis, el sistema de validación, y toda la información necesaria para replicar el estudio.
- En los resultados se deben especificar claramente los hallazgos en secuencia lógica. Es importante revisar si las tablas o cuadros presentados son necesarios o, caso contrario, redundantes con el contenido del texto.
- En la discusión se deben interpretar los datos obtenidos a la luz de la revisión de la literatura. Los autores deberán incluir aquí si su artículo apoya o contradice las teorías previas. Las conclusiones resumirán los avances que la investigación plantea en el área del conocimiento científico, las futuras líneas de investigación y las principales dificultades o limitaciones para la realización de la investigación.
- Idioma: Se valorará positivamente si el idioma utilizado facilita la lectura y va en favor de la claridad, sencillez, precisión y transparencia del lenguaje científico. El Revisor no debe proceder a corrección, ya sea en español o inglés, sino que informará a los Editores de estos errores gramaticales u ortotipográficos.
- Finalmente, se requiere una profunda revisión de las referencias por si se hubiera omitido alguna obra relevante. Las referencias han de ser precisas, citando en la lógica de la temática a estudiar, sus principales obras así como los documentos que más se asemejen al propio trabajo, así como las últimas investigaciones en el área.

3. Dimensiones relevantes de valoración

Para el caso de artículos de investigaciones empíricas, «**Sophia**» utiliza una matriz de evaluación de cada original que responde a los criterios editoriales y al cumplimiento de la normativa de la publicación. En este sentido los revisores deberán atender a la valoración cuali-cuantitativa de cada uno de los aspectos propuestos en esta matriz con criterios de objetividad, razonamiento, lógica y experticia.

Para el caso de artículos reflexivos, estudios, revisiones de literatura (estado de la cuestión) u otro tipo de estudio (informes, propuestas, experiencias, entre otras), el Consejo Editorial remitirá a los revisores una matriz distinta, comprendiendo las características propias de estructura de este tipo de originales:

ESTUDIOS, PROPUESTAS, INFORMES Y EXPERIENCIAS	
Ítems valorables	Puntaje
01. Pertinencia del título (claridad, precisión y con un máximo de 85 caracteres).	0/5
02. Resumen (En un solo párrafo y sin epígrafes, mínimo/máximo: 210-220 palabras).	0/5
03. Introducción (breve presentación del tema; formulación del problema; idea a defender o hipótesis a demostrar; objetivo; importancia del tema; actualidad; metodología; estructura del documento).	0/5
04. Revisión de la fundamentación bibliográfica (Además de usar bibliografía actual considerar la inclusión de documentos de Sophia).	0/10
05. Estructura y organización del artículo (capacidad argumentativa, coherencia y redacción científica).	0/10
06. Aportaciones originales y análisis contextualizados.	0/5
07. Conclusiones que respondan al tema, al problema y al objetivo planteado.	0/5
0.8. Citaciones y referencias de acuerdo a la normativa y al formato solicitado por la revista (Todo documento y autor que conste en la sección de bibliografía debe constar en el cuerpo del artículo y viceversa).	0/5
Total máximo	50 puntos

INVESTIGACIONES	
Ítems valorables	Puntaje
01. Pertinencia del título (claridad, precisión y con un máximo de 85 caracteres)	0/5
02. Resumen (En un solo párrafo y sin epígrafes, mínimo/máximo: 210-220 palabras).	0/5
03. Introducción (breve presentación del tema; formulación del problema; idea a defender o hipótesis a demostrar; objetivo; importancia del tema; actualidad; metodología; estructura del documento).	0/5
04. Revisión de la fundamentación bibliográfica (Además de usar bibliografía actual considerar la inclusión de documentos de Sophia). Rigor metodológico y presentación de instrumentos de investigación.	0/10



05. Estructura y organización del artículo (capacidad argumentativa, coherencia y redacción científica). Análisis y resultados de investigación con secuencia lógica en el texto. Presentación de tablas y figuras sin duplicidad de datos.	0/10
0.6. Aportaciones originales y análisis contextualizados de los datos.	0/5
0.7. Discusión, conclusiones y avances que respondan al tema, al problema y al objetivo planteado.	0/5
0.8. Citaciones y referencias de acuerdo a la normativa y al formato solicitado por la revista (Todo documento y autor que conste en la sección de bibliografía debe constar en el cuerpo del artículo y viceversa).	0/5
Total máximo	50 puntos

4. Cuestiones éticas

- a. Plagio: Aunque la revista utiliza sistemas de detección de plagio, si el revisor sospechare que un original es una copia sustancial de otra obra, ha de informar de inmediato a los Editores citando la obra anterior con tanto detalle cómo le sea posible.
- b. Fraude: Si hay sospecha real o remota de que los resultados en un artículo son falsos o fraudulentos, es necesario informar de ellos a los Editores.



5. Evaluación de los originales

Una vez realizada la evaluación cuanti-cualitativa del manuscrito en revisión, el revisor podrá realizar recomendaciones para mejorar la calidad del original. Sin embargo, se atenderá a la calificación del manuscrito de tres maneras:

- a. **Rechazo** debido a las deficiencias detectadas, justificadas y razonadas con valoración cualitativa y cuantitativa. El informe ha de ser más extenso si obtiene menos de los 30 de los 50 puntos posibles.
- b. **Aceptación sin revisión.**
- c. **Aceptación condicionada** y por ende con revisión (mayor o menor). En este último caso, se ha de identificar claramente qué revisión es necesaria, enumerando los comentarios e incluso especificando párrafos y páginas en las que sugieren modificaciones.

Protocol of Manuscript Evaluation for External Reviewers

Instructions

- The fulfillment of each one of the articles will be valued in agreement to the following protocol.
- The total sum of the articles will determine the approval or rejection of the article.
- The minimal puntaje in order that the article is approved will be of 44/50.

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Article Details	
Date of submission for evaluation:	Date of return of evaluation: Article code:
Title of the article to be evaluated:	
SECTION: REPORTS, STUDIES, PROPOSALS AND REVIEWS	
01.- Relevancy of the title (clarity, precision and with a maximum of 85 characters)	Mandatory comments:
	Value from 0 to 5
02.- They summarize (In an alone paragraph and without epigraphs, minimum / minimal: 210-220 words).	Mandatory comments:
	Value from 0 to 5
03.- Introduction (brief presentation of the topic; formulation of the problem; it designs to defending or hypothesis to demonstrating; I target; importance of the topic; current importance; methodology; structure of the document)	Mandatory comments:
	Value from 0 to 5
04.- Review of the bibliographical foundation (Beside using current bibliography to consider the incorporation of Sophia's documents).	Mandatory comments:
	Value from 0 to 10

05.- Structure and organization of the article (argumentative capabilities, coherence and scientific redaction)	Mandatory comments:	
	Value from 0 to 10	
06.- Original contributions and contextualized analyses	Mandatory comments:	
	Value from 0 to 5	
07.- Conclusions that answer to the topic, to the problem and to the raised aim	Mandatory comments:	
	Value from 0 to 5	
08.- Citations and references of agreement to the regulation and to the format requested by the magazine (Any document and author who consists in the section of bibliography must consist in the body of story and vice versa)	Mandatory comments:	
	Value from 0 to 5	
OBTAINED PUNCTUATION	Of the total of 50 predictable points, this assessor grants:	

REDACTED OPINION More detailed if the work does not get 44 points, to inform the autor (s). This text is sent verbatim to the autor (s) anonymously			
RECOMMENDATION ON HIS PUBLICATION IN SOPHIA			
Validation criteria	Result		
	Yes	Yes, with conditions	No
01. Widely recommended			
02. Recommended only if his quality is improved attending to the totality of the suggestions realized by the revisers			
03. His publication is not recommended			
PROPOSED CHANGES (In case of “Yes, with conditions”)			

Protocolo de evaluación de manuscritos para revisores externos

Instrucciones

- El cumplimiento de cada uno de los ítems será valorado de acuerdo al siguiente protocolo.
- La suma total de los ítems determinará la aprobación o rechazo del artículo. El puntaje mínimo para que el artículo sea aprobado será de 44/50.

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Datos del artículo		
Fecha envío evaluación:	Fecha devolución evaluación:	Código artículo:
Título del artículo a evaluar:		
SECCIÓN: ESTUDIOS, PROPUESTAS, INFORMES Y REVISIONES		
01.- Pertinencia del título (claridad, precisión y con un máximo de 85 caracteres)	Comentarios obligatorios:	
	Valore de 0 a 5	
02.- Resumen (En un solo párrafo y sin epígrafes, mínimo/máximo: 210-220 palabras).	Comentarios obligatorios:	
	Valore de 0 a 5	
03.- Introducción (breve presentación del tema; formulación del problema; idea a defender o hipótesis a demostrar; objetivo; importancia del tema; actualidad; metodología; estructura del documento)	Comentarios obligatorios:	
	Valore de 0 a 5	
04.- Revisión de la fundamentación bibliográfica (Además de usar bibliografía actual considerar la inclusión de documentos de Sophia)	Comentarios obligatorios:	
	Valore de 0 a 10	
05.- Estructura y organización del artículo (capacidad argumentativa, coherencia y redacción científica)	Comentarios obligatorios	
	Valore de 0 a 10	

06.- Aportaciones originales y análisis contextualizados	Comentarios obligatorios:	
	Valore de 0 a 5	
07.- Conclusiones que respondan al tema, al problema y al objetivo planteado	Comentarios obligatorios:	
	Valore de 0 a 5	
08.- Citaciones y referencias de acuerdo a la normativa y al formato solicitado por la revista (Todo documento y autor que conste en la sección de bibliografía debe constar en el cuerpo del artículo y viceversa)	Comentarios obligatorios:	
	Valore de 0 a 5	
PUNTUACIÓN OBTENIDA	Del total de 50 puntos previsibles, este evaluador otorga:	

OPINIÓN REDACTADA (Más detallada si el trabajo no tiene 44 puntos, para informar al autor/es) Este texto se remite textualmente al/ los autor/es de forma anónima			
RECOMENDACIÓN SOBRE SU PUBLICACIÓN EN SOPHIA			
PUBLICABLE	Resultado		
	SI	Sí, con condiciones	NO
01. Ampliamente recomendado			
02. Recomendado sólo si se mejora su calidad atendiendo a la totalidad de las sugerencias realizadas por los revisores			
03. No se recomienda su publicación			
MODIFICACIONES PROPUESTAS (En caso de «Sí, con condiciones»)			

Checklist prior to sending the manuscript

1. CHECK OF THE MANUSCRIPT, PRIOR TO SENDING	
To facilitate the process of evaluation of the manuscript and to accelerate the report of its possible publication, a final self-review of the manuscript is advised, checking the following questions.	
COVER LETTER	
Title of the manuscript in spanish (maximum 85 characters).	
Title of the manuscript in english (maximum 85 characters).	
The two versions of the title of the manuscript are concise, informative and collect as many identifiable terms as possible.	
The abstract in spanish is included, in a single paragraph and without epigraphs (minimum / maximum: 210/220 words).	
The abstract in english is included, in a single paragraph and without epigraphs (minimum / maximum: 210-220 words).	
Abstracts in spanish and english respond in order to the following issues: justification of the subject, objectives, study methodology, results and conclusions.	
It includes 6 descriptors (in english and spanish) (only simple words, not phrases or combinations of words), with the most significant terms, and if possible standardized.	
The texts in english (title, abstract and descriptors) have been written or verified by an official translator or expert in this language (The use of automatic translators is prohibited).	
All the identification data of the authors are included in the order stipulated in the norms: identification and correspondence data, professional filiations, last academic degree...	
The first and last name of the authors has been normalized.	
Each author is identified with their ORCID code.	
The maximum number of authors is three, with the exception of those works that justify a higher but limited number of authors	
The author(s) have duly signed the letter of presentation of the article, which includes the partial transfer of rights and the declaration of conflict of interest.	
MANUSCRIPT	
It includes title of the manuscript, abstract, and keywords. All in spanish and english.	

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An introduction is included that in order contains: brief presentation of the subject; problem formulation; Idea to defend or hypothesis to prove; objective; Importance of the theme; relevance; methodology; structure of the document.	
The text is within the minimum and maximum extension: In the Review sections: 10,000/11,000 words of text (including references). In the research section: 8,000/9,500 words of text (including references). Reports, Studies: 8,000/9,500 words of text (including references).	
In case of research, the manuscript responds to the structure required in the guidelines (IMRDC).	
In the case of a report, study or review, the manuscript respects the minimum structure required by the guidelines.	
The review work includes three citations from three previous issues of Sophia Journal.	
The manuscript explicitly cites and cites the used sources and materials.	
The methodology described for the research work is clear and concise, allowing its replication, if necessary, by other experts.	
The conclusions follow on objective and problem raised are supported by the results obtained and presented in the form of a synthesis.	
If statistical analyzes have been used, they have been reviewed/contrasted by an expert.	
The citations in the text are strictly in accordance with the APA 6 regulations, reflected in the instructions.	
In case of use of final notes, it has been verified that these are descriptive and cannot be integrated into the general citation system. Footnotes are not acceptable.	
The final references have been rigorously reviewed and only those that have been cited in the text are included.	
The final references conform in style and format to the international standards used in Sophia.	
The number of references is according to the theoretical basis of the study carried out	
DOIs have been included in all References that carry it in the following format: doi: https://doi.org/XXXXXX	
All web addresses of references have been shortened with Google Url Shortner	
If figures and charts are included, they should provide additional and not repeated information in the text. Their graphic quality has been verified.	
The number of charts and / or figures does not exceed 6	
If the case, financial support is declared.	

ASPECTOS FORMALES	
The rules have been strictly observed in the use of bold, capital letters, italics and underlines.	
Arial font, size 12 has been used.	
A single line spacing (1) has been used without tab.	
The epigraphs have been properly and hierarchically numbered in Arabic.	
Double spaces have been deleted.	
The typographic quotes « » (with alt + 174 and alt + 175 for opening and closing) have been used.	
Word dictionary for surface spelling has been used.	
The text has been supervised by external staff to ensure grammar and style.	
PRESENTATION	
Attached is a cover letter indicating originality, novelty of the work and section of the journal to which it is addressed, and if appropriate, informed consent of experimentation.	
The cover letter includes an attachment signed by all authors, being responsible for the authorship and giving the copyright to the publisher.	
The manuscript is uploaded to the platform in Word format and without authors identification	
ANNEXED DOCUMENTS	
Attached are the two attached documents: the cover letter and the manuscript.	
The accompanying documents and annexes have been published with Figshare.	

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Chequeo previo al envío del manuscrito

1. CHEQUEO DEL MANUSCRITO, PREVIO AL ENVÍO	
Para facilitar el proceso de evaluación del manuscrito y acelerar el informe de su posible publicación, se aconseja una autorevisión final del manuscrito, comprobando las siguientes cuestiones.	
DOCUMENTO PORTADA (Cover Letter)	
Se incluye título del manuscrito en español (máximo 85 caracteres).	
Se incluye título del manuscrito en inglés (máximo 85 caracteres).	
Las dos versiones del título del manuscrito son concisas, informativas y recogen el mayor número de términos identificativos posibles.	
Se incluye resumen en español, en un solo párrafo y sin epígrafes (mínimo/máximo: 210/220 palabras).	
Se incluye abstract en inglés, en un solo párrafo y sin epígrafes (mínimo/máximo 210-220 palabras).	
Los resúmenes en español e inglés responden ordenadamente a las siguientes cuestiones: justificación del tema, objetivos, metodología del estudio, resultados y conclusiones.	
Se incluyen 6 descriptores (en español e inglés) (sólo palabras simples, no sintagmas o combinaciones de palabras), con los términos más significativos, y a ser posibles estandarizados.	
Los textos en inglés (título, resumen y descriptores) han sido redactados o verificados por un traductor oficial o persona experta en este idioma (Se prohíbe el uso de traductores automáticos).	
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MANUSCRITO	
Se incluye título del manuscrito en español, inglés, resumen, abstract, descriptores y keywords	

Se incluye una introducción que en orden contiene: breve presentación del tema; formulación del problema; idea a defender o hipótesis a demostrar; objetivo; importancia del tema; actualidad; metodología; estructura del documento.	
El trabajo respeta la extensión mínima y máxima permitidas: Sección de Revisiones: 10.000/11.000 palabras de texto (incluidas las referencias). Investigaciones: 8.000/9.500 palabras de texto (incluidas referencias). Informes, Estudios: 8.000/9.500 palabras de texto (incluidas referencias).	
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Si se trata de un informe, estudio o revisión, el manuscrito respeta la estructura mínima exigida en las normas.	
En los trabajos de revisión se incluyen tres citas de tres números anteriores de la Revista Sophia.	
El manuscrito explicita y cita correctamente las fuentes y materiales empleados.	
La metodología descrita, para los trabajos de investigación, es clara y concisa, permitiendo su replicación, en caso necesario, por otros expertos.	
Las conclusiones responden al objetivo y al problema planteados, se apoyan en los resultados obtenidos y se presentan en forma de síntesis.	
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El número de referencias está de acuerdo a la fundamentación teórica del estudio realizado	
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DOCUMENTOS ANEXOS	
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Cover Letter

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Miscellaneous ___

Title in Spanish: Arial 14 bold and centered.

Maximum 85 characters with spaces

Title in English: Arial 14 cursive. Maximum 805 characters with spaces

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Professional category, Institution, Country

Institutional email

ORCID

Name author 2 (standardized)

Professional category, Institution, Country

Institutional email

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Name author 3 (standardized)

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Abstract (Spanish)

Minimum 210 and maximum 220 words. It must include 1) Justification of the topic; 2) Objectives; 3) Methodology; 4) Main results; 5) Main conclusions. It must be impersonally written “The present paper analyzes...”

Abstract (English)

Minimum 200 and maximum 210 words. It must include 1) Justification of the topic; 2) Objectives; 3) Methodology; 4) Main results; 5) Main conclusions. It must be impersonally written “The present paper analyzes...” Do not use automatic translation systems.

Keywords (Spanish)

6 standardized terms preferably of a single word and of the UNESCO Thesaurus separated by commas (,).

Keywords

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Cover Letter

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Dossier Monográfico ___

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Título en español: Arial 14 negrita y centrado.

Máximo 85 caracteres con espacios

Title in English: Arial 14 cursiva. Máximo 85 caracteres con espacios

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Resumen

Mínimo 210 y máximo 220 palabras. Debe incluir 1) Justificación del tema; 2) Objetivos; 3) Metodología; 4) Principales resultados; 5) Principales conclusiones. Ha de estar escrito de manera impersonal “El presente trabajo analiza...”

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Apoyos y soporte financiero de la investigación (opcional)

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PRESENTATION Cover Letter

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Having read the regulations of the journal «Sophia» and analyzed its coverage, thematic area and approach, I consider that this journal is the ideal one for the dissemination of the work that I hereby attach, for which I beg you to be submitted for consideration for publication. The original has the following title “_____”, whose authorship corresponds to _____.

The authors (s) certify that this work has not been published, nor is it under consideration for publication in any other journal or editorial work.

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Announcements 2021-2025 / Convocatorias 2021-2025

ANNOUNCEMENTS 2021-2025

Sophia 32

Philosophical reflection on the quality on education

Descriptors: Analysis of the concept of “quality” in education; Philosophical, psychological and pedagogical fundamentals of quality in education; Quality and comprehensive and inclusive educational models; Philosophical basis of complex competences in education; Quality and skills in education; Approach of the capacities and educational quality.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: July 15, 2021

Publication date of this issue: January 15, 2022

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Sophia 33

Philosophy of the mind and education

Descriptors: Effects and causes of mental states; The nature of mental states and their importance in education; Monistic responses to the mind-body problem; Theories about the philosophy of mind; The philosophy of mind at the present; Philosophy of mind and its relationship with other sciences; Foundation of mental activity and behavior; Relationship of the philosophy of mind with psychology; Philosophy of mind and education; The power of the mind in education; Pedagogical strategies for the development of the mind; Concept of disability or mental dysfunction: implications and proposals in education.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: December 15, 2021

Publication date of this issue: July 15, 2022

Sophia 34

Philosophy, anthropology and education

Descriptors: Philosophical foundations of ethnography; Philosophical basis of cultural theories; Contributions of cultural and social anthropology to education; Philosophical foundation of dialogue between cultures; Interculturality, multiculturalism and education; The task of philosophy in intercultural dia-

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logue; The thought of diversity and its educational importance; Global citizenship, cosmopolitanism and education; Ecosophy, culture and transdisciplinarity.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: July 15, 2022

Publication date of this issue: January 15, 2023

Sophia 35

Philosophical currents and their impact on pedagogical orientations

Descriptors: Philosophy as the fundamental basis of pedagogical orientations. Idealism as the basis for the generation of pedagogical orientations; Rationalism as the foundation of pedagogical orientations; Empiricism as the basis of educational realism; Illustration as support of educational enlightenment; Other philosophical currents as the basis of theories or pedagogical orientations throughout history; Philosophical foundations of the new pedagogies; Philosophy of technology in the educational field; Philosophical basis of constructivism and other pedagogical theories; Ethical thinking and pedagogy; Philosophical critique of current educational models; Philosophy of dialogue and education; Hermeneutics and their contributions to the current pedagogy.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: December 15, 2022

Publication date of this issue: July 15, 2023

Sophia 36

Philosophical approach to learning as a cognitive process

Descriptors: Philosophical basis of learning; Learning as a cognitive process; Learning as a product and as a process of knowledge; Philosophical foundation of learning theories; Psychological and pedagogical foundations of learning; Philosophical foundations of multiple intelligences and education; Emotional intelligence and its impact on educational processes; Science and philosophy of human emotions: educational repercussions; Sense and meaning of cognitive processes; Memory, thought and language as the main cognitive processes of the human being; Cognitive processes and meaningful learning.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: July 15, 2023

Publication date of this issue: January 15, 2024

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Sophia 37

Physics, metaphysics and education

Descriptors: Philosophical reflections on the interpretation of physics; Metaphysics in the twenty-first century; History of physics and its educational approach; Relations between conceptions of physics in the history of philosophy; Problem of sense and truth in the philosophy of physics; Nature and implications of thermodynamics; Epistemology and guiding principles of current physical theories; Philosophical foundations of quantum mechanics; Philosophical implications of quantum theory; Philosophical implications of Newtonian physics; Philosophical implications of the theory of relativity; Pedagogical strategies in the teaching-learning of physics; Educational proposals to boost the understanding of physics; Philosophical implications of current theoretical physics.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: December 15, 2023

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Sophia 38

The inductive method in the humanities and pedagogy

Descriptors: Scientific activity and reflection on the method of knowledge; The inductive method in the social sciences; Induction, experience and action as the foundation of pedagogy; The methods of knowledge and learning in the humanities; Value and limits of the experimental method in the human sciences; Value and limits of pedagogical positivism; Reflections on the scientific method and implications in the learning processes; Applications of the inductive method in education; Usefulness of the inductive method for psychology; Pedagogical proposals of an inductive character in the human sciences.

Generation of articles from representatives of philosophy prominent in the central theme and its implications in psychology, pedagogy or other disciplines.

Deadline for receipt of manuscripts: July 15, 2024

Publication date of this issue: January 15, 2025

CONVOCATORIAS 2021-2025

Sophia 32

Reflexión filosófica sobre la calidad en la educación

Descriptores: Análisis del concepto de “calidad” en la educación; fundamentos filosóficos, psicológicos y pedagógicos de la calidad en educación; calidad y modelos educativos integrales e inclusivos; bases filosóficas de las competencias complejas en la educación; la calidad y las competencias en la educación; enfoque de las capacidades y calidad educativa.

Generación de artículos desde representantes de la filosofía destacados en el tema central y sus implicaciones en la psicología, en la pedagogía o en otras disciplinas.

Fecha límite para la recepción de manuscritos: 15 de julio de 2021

Fecha de publicación de esta edición: 15 de enero de 2022

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Sophia 33

Filosofía de la mente y educación

Descriptores: Efectos y causas de los estados mentales; la naturaleza de los estados mentales y su importancia en educación; respuestas monistas al problema mente-cuerpo; teorías sobre la filosofía de la mente; la filosofía de la mente en la actualidad; filosofía de la mente y la relación con otras ciencias; fundamento de la actividad mental y de la conducta; relación filosofía de la mente con la psicología; filosofía de la mente y educación; el poder de la mente en la educación; estrategias pedagógicas para el desarrollo de la mente; concepto de discapacidad o disfunción mental: implicaciones y propuestas en educación.

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Fecha límite para la recepción de manuscritos: 15 de diciembre de 2021

Fecha de publicación de esta edición: 15 de julio de 2022

Sophia 34

Filosofía, antropología y educación

Descriptores: Fundamentos filosóficos de la etnografía; bases filosóficas de las teorías culturales; aportaciones de la antropología cultural y social a la educación; fundamentación filosófica del diálogo entre culturas; interculturalidad, mul-

ticulturalidad y educación; el quehacer de la filosofía en el diálogo intercultural; el pensamiento de la diversidad y su importancia educativa; ciudadanía global, cosmopolitismo y educación; ecosofía, cultura y transdisciplinariedad.

Generación de artículos desde representantes de la filosofía destacados en el tema central y sus implicaciones en la psicología, en la pedagogía o en otras disciplinas.

Fecha límite para la recepción de manuscritos: 15 de julio de 2022

Fecha de publicación de esta edición: 15 de enero de 2023

Sophia 35

Corrientes filosóficas y su incidencia en las orientaciones pedagógicas

Descriptores: La filosofía como base fundamental de las orientaciones pedagógicas. El idealismo como base para la generación de orientaciones pedagógicas; el racionalismo como fundamento de orientaciones pedagógicas; el empirismo como sustento del realismo educativo; la ilustración como apoyo del iluminismo educativo; otras corrientes filosóficas como base de teorías u orientaciones pedagógicas a través de la historia; fundamentos filosóficos de las nuevas pedagogías; filosofía de la tecnología en el ámbito educativo; bases filosóficas del constructivismo y de otras teorías pedagógicas; pensamiento ético y pedagogía; crítica filosófica a los modelos educativos actuales; filosofía del diálogo y educación; la hermenéutica y sus aportaciones a la pedagogía actual.

Generación de artículos desde representantes de la filosofía destacados en el tema central y sus implicaciones en la psicología, en la pedagogía o en otras disciplinas.

Fecha límite para la recepción de manuscritos: 15 de diciembre de 2022

Fecha de publicación de esta edición: 15 de julio de 2023

Sophia 36

Enfoque filosófico del aprendizaje como proceso cognitivo

Descriptores: Bases filosóficas del aprendizaje; el aprendizaje como proceso cognitivo; el aprendizaje como producto y como proceso del conocimiento; fundamento filosófico de las teorías del aprendizaje; fundamentos psicológicos y pedagógicos del aprendizaje; fundamentos filosóficos de las inteligencias múltiples y educación; la inteligencia emocional y su incidencia en los procesos educativos; ciencia y filosofía de las emociones humanas: repercusiones educativas; sentido y significado de los procesos cognitivos; memoria, pensamiento y lenguaje como principales procesos cognitivos del ser humano; procesos cognitivos y aprendizajes significativos.



Generación de artículos desde representantes de la filosofía destacados en el tema central y sus implicaciones en la psicología, en la pedagogía o en otras disciplinas.

Fecha límite para la recepción de manuscritos: 15 de julio de 2023

Fecha de publicación de esta edición: 15 de enero de 2024

Sophia 37

Física, metafísica y educación

Descriptores: Reflexiones filosóficas acerca de la interpretación de la física; la metafísica en el siglo XXI; historia de la física y su planteamiento educativo; relaciones entre concepciones de la física en la historia de la filosofía; problema del sentido y de la verdad en la filosofía de la física; naturaleza e implicaciones de la termodinámica; epistemología y principios rectores de las teorías físicas actuales; fundamentos filosóficos de la mecánica cuántica; implicaciones filosóficas de la teoría cuántica; implicaciones filosóficas de la física newtoniana; implicaciones filosóficas de la teoría de la relatividad; estrategias pedagógicas en la enseñanza-aprendizaje de la física; propuestas educativas para dinamizar la comprensión de la física; implicaciones filosóficas de la física teórica actual.

Generación de artículos desde representantes de la filosofía destacados en el tema central y sus implicaciones en la psicología, en la pedagogía o en otras disciplinas.

Fecha límite para la recepción de manuscritos: 15 de diciembre de 2023

Fecha de publicación de esta edición: 15 de julio de 2024

Sophia 38

El método inductivo en las humanidades y en la pedagogía

Descriptores: La actividad científica y reflexión sobre el método de conocimiento; el método inductivo en las ciencias sociales; inducción, experiencia y acción como fundamento de la pedagogía; los métodos de conocimiento y aprendizaje en las humanidades; valor y límites del método experimental en las ciencias humanas; valor y límites del positivismo pedagógico; reflexiones sobre el método científico e implicaciones en los procesos de aprendizaje; aplicaciones del método inductivo en la educación; utilidad del método inductivo para la psicología; propuestas pedagógicas de carácter inductivo en las ciencias humanas.

Generación de artículos desde representantes de la filosofía destacados en el tema central y sus implicaciones en la psicología, en la pedagogía o en otras disciplinas.

Fecha límite para la recepción de manuscritos: 15 de julio de 2024

Fecha de publicación de esta edición: 15 de enero de 2025

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