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Psychoanalysis and science: the equation of the subjects

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Abstract: This article aims to demonstrate that Jacques Lacan's assertion that modern science was the condition of possibility of the emergence of psychoanalysis derives a set of propositions: to modern science; psychoanalysis could only arise in the modernity of thought; and between psychoanalysis and science there is a logic of compatibility. To do so, from an epistemological point of view, the article aims to define the status of a world affected by modern scientific activity as opposed to the ancient world. This led research to the axiomatic, in a broader scope, from Descartes' works and mathematical physics, which proposes a caesura that affects all existing discourses. With the mathematization of thought, the qualities of the existent were abolished, thereby providing the propitious ground for the emergence of the subject of the unconscious, which Lacan will allocate between signifiers, promoting an essentially modern theory of the subject.

Keywords: psychoanalysis, science, subject, signifier.

Psychoanalysis and science: the equation of the subjects

This article, which is inserted in a project of the Federal University of Rio Grande do Sul, is the result of discussions that intersect psychoanalysis and academic research. The study, whose object includes investigating the foundations of clinical research in psychoanalysis, the aim being to reflect on the relationship between psychoanalysis and science, since the latter, in modernity, becomes the ideal model for research activity in universities. Thus, in bringing psychoanalysis to a debate with scientific activity, the researchers, alongside the aforementioned project, intend to present another point of articulation to consider the field of psychoanalysis problems and its practice of investigation in undergraduate and postgraduate courses.

Therefore, due to the arrival of psychoanalysis in the university scope, one is led to question what type of link is established between the praxis inaugurated by Freud and modern scientific activity. The course most undertaken by some theorists in this sense is the search for coordinates that establish the status of scientificity for the psychoanalytic praxis. This article, in turn, will follow the same path that Lacan (1964/2008) took, which places the possibility of reflecting upon useful theoretical ground for this discussion in the works of Alexandre Koyré. Thus, the research will start based on the assumption that responding to the demand of science in psychoanalysis can be configured in epistemological error, because it would homogenize fields that try to transform different problems into intelligible issues.

Thus, Lo Bianco (2003) points out that many of the projects designed to affirm the scientificity of psychoanalysis are now focused on a methodological approach that favors quantitative research, whose results are analyzes of therapeutic efficacy based on cost-benefit marketing criteria; they are undertakings that aim to locate psychoanalytic theory within positive science, in which the central aim is to search for empirical evidence of Freudian metapsychology. Both projects, as the author states, disregard the specificity of the object of psychoanalysis: the subject of the unconscious.

In this sense, this article will not seek to assume the coordinates of the ideal of science on which psychoanalytical practice and the conceptual field will be based, but rather aim to interrogate the type of relationship that is established between psychoanalysis and modern science. To do so, the researchers will use the field of epistemology whose nodal point, in their view, is what is unified under the following axiomatic: "not only there is a scope, but there are broader scopes" (Milner, 1980/1996, p. 67, free translation).

The development of this axiom will lead the subject to the emergence of modernity, which is in agreement with Lacan's assertion that the condition of possibility of the emergence of psychoanalysis was the foundation of what is termed 'modern', and that in turn, one may portray it in "a historically defined moment; we may have to know whether it is rigorously repeatable in experience: what was inaugurated by Descartes and which is called *cogito*" (Lacan, 1965/1998, p. 870, free translation).

Following this trajectory, we can locate Lacan's emblematic statement (1965/1998) that "the subject on whom we operate in psychoanalysis can only be the subject of science" (p. 873). Using Jean-Claude Milner (1980/1996), this article will try to demonstrate the possibility of analyzing this Lacanian axiom in what the equation of the subjects encompasses, that is, the existence of a logical

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compatibility, as Calazans (2006) states, between the way to address problems through psychoanalysis and modern science. The way this attempt will be traced will enable the statement that both psychoanalysis and science strip the qualities from the existents.

Epistemology of science: the mathematization of physics is a broader scope

Before going into the epistemology of science properly, it is necessary to defend the researchers' position in affirming that there is modern science and that we conceive it from a broader scope. Lacan (1965/1998, p. 871, free translation) states that the birth of science must be taken in the absolute sense, while making explicit reference to the works of Koyré. Milner (1980/1996) will find in this the reason "for which science is essential to the existence of psychoanalysis" (p. 32, free translation).

The researchers will comprehend the emergence of science in what is inscribed as modern from the scope operated by Galileo in regards to the mathematization of physics. Later the article will introduce how this sets up a new order in thought, but more importantly it is our task to assume that the foundation for this statement is centered on what Milner (1980/1996, p. 63, free translation) called the "language scope". It is the axiomatic point that there are caesuras in the discourses that found new fields of problems. Thus, using the works of Koyré and Kojève, Milner (1980/1996) finds a combination of propositions that not only indicates the existence of scopes, but also a scope that would affect all existing discourses, that is, a broader scope. Thus, when we affirm that "not only is there a scope, but there are broader scopes" (Milner, 1980/1996, p. 67, free translation), this article is following a path in epistemology that considers the emergence of modern science as the fruit of a split that affects not only specific locations of speeches, but also the whole universe. What is at stake, in this sense, is the creation of a new world in opposition to an ancient world.

Given this, this paper will aim to address two points that are articulated and that help us to ratify Lacan's thesis that the emergence of the subject from the unconscious is due to the advent of modern science. The points are: the mathematization of physics and the emptying of properties of the subject from the incidence of the signifier.

The emergence of modern science will not only imply new coordinates to comprehend the universe, but also the possibility of a new vectorization of reading for epistemology to read and intelligibly transform the ways of addressing problems in scientific activity. This is what Gaston Bachelard (1971/2006) demonstrates in stating that science, contrary to the beliefs of classical positivism and idealism, would not be constituted by constant continuity, whose unfolding would be a gradual and restricted accumulation of scientific knowledge. For this philosopher, scientific thought is formed based on epistemological scopes that, far from occurring from the cumulative development of its principles, are produced by the reorganization of reason, with the installation of fields of problems that are different from what one previously had.

Thus, taking the stand to think on the development of science would be contrary to the evocation of a continuous narrative. What is at stake in this refusal is the possibility of not rejecting the dialectical movement of scientific inquiry. In this aspect, the article distances itself from historians of positivist science, who advocate a continuum and evolutionary statute for science. The significant problem with this position is that it presupposes a supremacy of the sensory organs as a way to apprehend the scientifically real. Our position to this extent is to approach the structure of scientific activity not through the positivist experiment, but rather through the logical-abstract character that is inaugurated with modern physics from the broader scope: the insertion of mathematics as the field of production of scientific phenomena.

It is in this sense that Bachelard (1971/2006) will also demarcate that, in the field of philosophy, science was marked by unified principles as an absolute means of apprehending that which is real. Thus, for the adherents of classical positivism whose uniformity lay in sensuous experience, and for the idealists whose uniformity was justified by the absolute separation of experience and reason, what was formed in the scientific-philosophical field was a homogeneous knowledge that sometimes worked in favor of the use of sensory organs, sometimes of the a priori frames of reason, without the possibility of dialectizing.

However, the modes of operation for scientific activity reading begin to undergo intense blows with the emergence of a microphysical world. The scientific spirit of before becomes ineffective to account for the establishment of a world that is unknown to the sensuous experience of the scientist, which also corroborates the installation of a crisis in rationalism – which will be called "dogmatic" in this article. As Robert Blanché (1967/1983, p. 65-66, free translation) enlightens us, "the knowledge that the old fundamental concepts of science are applicable only to the region of average magnitudes, here stands the Copernican revolution of our time". It is in this sense that the world of the infinitely small now requires substantial change in the *modus operandi* of science to address the new field of problems.

With this, there is what one can demarcate as a new statute of the object of science, considering another take through the epistemological lenses to observe its field of problems. For Bachelard (1934/1985), the advent of modern physics, which engenders the world of the infinitely small, promotes a fundamental change in the way that scientific inquiry is conducted, namely, "the realization of the rational or, more precisely, the achievement of the mathematician" (p. 13, free translation), so that what is established is the mathematization of physics, in which a new field of problems and approach to the scientific object

is configured, and articulated with a production process that goes from theorization to the real, not the other way around, as the realists thought.

In this sense, Alexandre Koyré (1973/1991) provides a distinction between experience and experimentation. Whereas the former approaches the field of common sense and Aristotelian physics, which, as will be demonstrated, is non-mathematical, while the second is closer to the line of thought affected by Descartes and Galileo. Experimentation was linked to the use of a methodically constructed language to interrogate phenomena.

A fundamental aspect is pointed out to the researchers: the use of mathematical language as a formal method of approaching nature. Thus, in order to circumscribe the magnitude of a larger epistemological scope one needs to make an effort to understand the consequences of the mathematization of physics. According to Koyré (1973/1991), this leads us to a rupture with Aristotelian cosmology, whose principles outlined a hierarchical world (in descending order: from God to things), composed of qualities and finitude; and the emergence of the "mathematization (geometrization) of nature and, therefore, the mathematization (geometrization) of science" (Koyré, 1973/1991, p. 155, free translation).

In this plane of thought, the first consequence to be derived from the destruction of Aristotelian cosmology is the production of a rupture in the way of thinking about the coordinates of the world. With the processes of mathematization of thought, the idea of a world ordered by qualities, finitude and hierarchies is replaced by new coordinates, such as:

> An open universe, indefinite and even infinite, unified and governed by the same universal laws, a universe in which all things belong to the same level of Being, contrary to the traditional conception that distinguished and opposed the two worlds of Heaven and Earth. (Koyré, 1973/1991, p. 155, free translation)

It is worth mentioning that what was at stake in this rupture was less the absolute disqualification of the way of addressing the problems in the old world and more the restructuring of reason to handle the new coordinates that were established. The new principles that were outlined did not seek to improve the old ones, but rather to surpass them, thus creating a new universe.

As Koyré (1973/1991) stresses, Aristotle's physics – even if consistent with an elaborate and systematic science – absolutely abdicates from mathematical thinking. The consequence of this way of analyzing the field of natural phenomena is "(a) the belief in the existence of qualitatively defined 'natures'; and (b) the belief in the existence of a Cosmos" (Koyré, 1973/1991, p. 157). This article will analyze how this is established in Aristotelian thought, based on its distinction between natural movements and violent movements, and how this distinction establishes the existence of a hierarchized world, endowed with qualities and finitude, that is, a world endowed with substance.

The idea of cosmos in Aristotle is structured from a harmonious order, in which things belong to a predetermined place, so that it can only be located in its natural place. This brings us to an orderly and static conception of the universe. In this sense, for any movement to be able to move something from its place, a resistance would be imposed in order to maintain its initial position. Aristotle called this movement of displacement "violence" (Koyré, 1973/1991).

Thus, everything that is of the movement implies either disorganization in the order of the universe, violence, or a resumption in the harmony of the things that would return to their respective places. There would be an effort of the Being to move in order to reorder the hierarchy of the universe, where each element has a place that is destined for it in advance. "It is this resumption to order that constitutes precisely what we call the 'natural' movement" (Koyré 1973/1991, p. 158, free translation).

Therefore, along with the established cosmic balance between natural movement and violent movement, Aristotelian physics would be shaped by founding a world endowed with hierarchies, in which things move around an unchanging axis, so that "movement is the being – or *actus* – of all that is not God" (Koyré, 1973/1991, p. 159, free translation). With this, the natural places of each thing would find themselves in a position below a higher place, whose central figure is divine, and which in turn acts as the cause, as the engine of the motions.

In this panorama, the world would be endowed with finitude inasmuch as each thing would correspond in a certain place, therefore, a thing cannot occupy more than one place at the same time or it will still be unable to occupy another space that does not correspond to it according to a previously established order.

The background to these coordinates, according to Koyré (1973/1991), is the denial of the vacuum, or rather, a total unawareness of it. To consider this would be an obstacle to the understanding of motion in Aristotle's physics. Now if one takes this into account, in a situation of vacuum, the nothingness of the environment would be incapable of stopping the movement of a body, the unfolding would be the destitution of the cosmic equilibrium, so that this body thrown into the emptiness of matter would move infinitely.

Galileo, on the other hand, introduces the consideration of an empty space of matter, content and activity. As Koyré (1973/1991, p. 161) states, "an empty space (that of geometry) completely destroys the conception of a cosmic order: in an empty space, not only are there no natural places; there are no places of any kind". It is, therefore, in the science of Galileo and in Descartes' philosophy[1], according to Koyré (1973/1991),

1 Since Descartes was the philosopher who inaugurated modernity, precisely because he was the first to reject all previous knowledge and consider the transformations of Galilean physics as truth.

possible for us to go beyond and refine the notions of motion and space. With the advent of the law of inertia, for example, a set of theorems and axioms that would be inoperative in an Aristotelian world can now be operated.

Therefore the consequences of the mathematization of physics are, in the first order, the rupture with the substantialist notion of Aristotle in which each entity had a corresponding place within a finite hierarchy. It is possible to think of the great impasse that the Aristotelian physicist would find him/herself in when he/she came across the impossibility of checking a body in an eternal movement. Thus, "it is not surprising that the Aristotelian felt astonished and lost in the face of this mind-bending effort to explain the real by the impossible, or all the same, to explain the real being by the mathematical being" (Koyré 1973/1991, p. 166, free translation).

It is to this extent that we can ratify the thesis that modern physics brings up from its mathematization, whose most precise effects are the constitution of a (geometrized) mathematical world in which the criteria of subjective qualities supplied to things are stripped. Thus, the blow suffered by science concerns the advent of the abstract of mathematics, which derogates from the apprehension of scientific problems by the perception of the senses. It is possible to see, therefore, a phenomena arising from an a priori of the operations of thought that establish, or, more precisely, that create the scientific object.

Using Francois Châtelet (1994), one can see that there is a fundamental change in the use of language to interrogate reality. If with Aristotle the verification of reality was derived from a daily language, in which the same characteristics of the spirit were attributed to the matter, then with the Galilean project what is portrayed is the emptying of meaning from the mathematical language, in its rigorous accuracy and intelligibility. From Galileo's physics, "mathematical language is the language of integral rationality" (Châtelet 1994, p. 65, free translation).

Thus, the researchers can state that the advent of modern science, with the operations of mathematization of physics, gave rise to a world devoid of qualities. It is an emptying of the universe and of the existent that corresponds to the beginning of the Cartesian project of using the doubt for all the ulterior knowledge to inaugurate a subject emptied of intrinsic qualities.

Psychoanalysis and science: the emergence of the subject without qualities

In this topic, the article will traverse a path that starts from an affirmation of Lacan found in writings such as *Science and the truth* (1965/1998),, *On the subject who is finally in question* (1966/1998) and the *Seminar on the four fundamental concepts of psychoanalysis* (1964/2008), from which it is only possible to conceive the subject of the unconscious from the emergence of modern science articulated with Cartesian thought.

In this regard, Jean-Claude Milner (1980/1996) indicates that this is an equation in which Lacan articulates three statements. Milner enunciated that the subject of science is the subject of psychoanalysis, namely, "(1) that psychoanalysis operates about a subject (and not, for example, about an I); (2) that there is a subject of science; (3) that these two subjects constitute only one" (Milner, 1980/1996, p. 28, free translation).

We can reiterate in Lacan's works (1965/1998) that modernity of thought is inaugurated with Descartes' and this inaugural moment correlates with the possibility of the emergence of the subject of psychoanalysis in its articulation with the advent of science from the mathematization (geometrization) of space, which is similar to Koyré (1973/1991). What is fundamental here is that which concerns the advent of *Cogito*, a place of all the support from Cartesian thought. Milner (1980/1996) advocates that this *Cogito* is precisely what testifies to scientific thought: the Cartesian edifice is the philosophical support of Galilean discoveries.

In this respect, we have what Milner calls Lacan's "radical Cartesianism", from which we can derive a set of propositions:

> if Descartes is the first modern philosopher, it is due to the *Cogito*; Descartes invents the modern subject; Descartes invents the subject of science; the Freudian subject, insofar as Freudian psychoanalysis is intrinsically modern, it could be nothing other than the Cartesian subject. (Milner, 1980/1996, p. 33, free translation)

It is valid to conclude that this is not a chronological linearity from these axioms; it is not in relation to a period in the history of thought that Lacan refers to in tracing these correlations. Rather, it is a question of analyzing how a zone of compatibility between the subject of science and the Freudian subject is established, inasmuch as the appearance of the *cogito* comes from a broader scope, which is dependent on the constitution of an infinite universe.

What the beginning of the Cartesian project provokes in the field of knowledge is a rejection of all knowledge through radical doubt. This can be observed in the first part of the book *The discourse on method*. Descartes uses all the knowledge that was destined to him of the noble schools of Europe in addition to everything that was possible for him to apprehend from the fields of knowledge, such as mathematics, philosophy, physics, the arts, to insert in his thought the necessity to examine all of them, "even the most superstitious and most false, in order to know their fair value and avoid being deceived by them" (Descartes, 1637/1996, p. 9-10, free translation).

To this extent, the Cartesian project starts apart from the center of philosophy, whose state of affairs was massively under the scrutiny of uncertainties – thus robbing

itself of a resolutely credible sustainment – and closer to the sciences, "insofar as they draw their principles from philosophy" (Descartes, 1637/1996, p. 12, free translation), and cannot, therefore, lay down sufficiently well-founded principles. We must emphasize here which science Descartes refers to and with this we are brought directly to the topic in which we approach what was constituted as Aristotelian cosmology: finite, descriptive, endowed with qualities and hierarchical.

From the hyperbolic doubt of Descartes arises the certainty of the Cogito. The *act of thinking*, therefore, establishes the certainty of the existence of the subject. However, it is really the act of thinking at the moment of its enunciation that leads us to the great Cartesian impasse: truth, as far as the existent is concerned, is only guaranteed at the moment in which thought is enunciated. By this one would have an evanescent subject and the problem of the philosopher would be to find an outlet that would uphold the validity of existing over time.

For Alain Badiou (1988/1996), the question of the subject in Descartes must be thought precisely from the place that the subject itself occupies, namely, the place of the enunciation. The certainty of the existence of the being will therefore come from the subject himself saying: *I think*. Thus, "the subject's point is *there*, where one thinks that by thinking he should be, he is. The connection between being and place underlies the radical existence of enunciation as the subject" (p. 336, free translation).

Thus, Cartesian thought promotes emptying of substance in the existent. Nothing that was supposed can acquire the status of truth; the subject will only have a certainty: that when he thinks, he is. However, the subject who is only affirmed at the moment of enunciation is an evanescent subject, who has neither materiality nor durability over the course of time, which will prove to be compatible with Lacan's use of the signifier in its articulation with the production of the subject.

In *Science and truth*, Lacan (1965/1998) even indicates a new writing for the aphorism of Descartes, he proposes that quotation marks should be added in the second sentence, thus forming a I think: "*therefore I am*". These quotation marks have the function of indicating that thought only institutes being, insofar as it is linked to speech, thus "the whole operation touches the essence of language" (p. 879, free translation).

The relationship between the emergence of Descartes' radical doubt and the emergence of Galileo's physics can be circumscribed with the advent of the category of the infinite. As Dunker (2008) states, when confronted with the insufficiency of medieval knowledge centered on a closed order – the finite cosmos – Cartesian philosophy, based on the astronomical and mathematical discoveries that established new ways of addressing the scientific problem, begin to search for "a specific point, safe and indisputable, that defines this new order (*mathesis universalis*) of knowledge, which will be the modern form of knowledge" (p. 5, free translation).

Thus, in regards to this subject launched by Descartes:

> The qualitative aspects of empirical individuality, whether psychic or somatic, will not fit; neither will the qualitative properties of a soul; he is neither mortal nor immortal, pure nor impure, just nor unjust, sinful nor holy, condemned nor saved; not even the formal properties we had long imagined to be constitutive of subjectivity will fit, such as: it has neither Si nor reflexivity nor consciousness. (Milner, 1980/1996, p. 33, free translation)

In this measure, it is to Koyré (1973/1991) that we owe the assertion that doubt is a method, or that the period of skepticism that inaugurates the *Cogito* was responsible for the production of rationalism in modern science. As previously stated in this work, science is broadened by a process constituted by the passage from nature endowed with qualities to the universe of mathematical precision, or even, depending on the perspective, with the insertion of the signifier, the symbolic, in the production of scientific knowledge. Thus, Ramos and Alberti (2013) indicate that "this means that the formalization of the real, specific of scientific practice, is in fact a symbolic arrangement. The scientific practice consists of a mathematization of the real, which is against quantification" (p. 211-212, free translation).

The subject between signifiers: Lacan and linguistics[2]

As previously stated, modern science has operated the abolition of qualities in the universe, i.e., through mathematizing, it has removed substance from the world. In a way, the processes of mathematization of the scientific object started having the status of the ideal of science, extending their field beyond the natural sciences. It is possible to observe with this the development of a scientific discursivity in modern thought that extended its limits more and more: an extended Galileanism.

The paradigm of structure, or rather, structuralism can be mentioned as an example. If, since Galileo, the scientific program is complied with the symbolic field of mathematics, geometric figures and numerical references, then other similar investigative projects will appear on the horizon of other areas of knowledge. Obviously, as Milner (1980/1996) warns us, this is not an absolute transposition, since leaving the field of nature and entering the social and human object must be based on adaptations. It is in this panorama that structuralism is inscribed.

2 There is no intention, within this heading, to state what the final and absolute position of Lacan was in his dialogue with linguistics. Instead, this article aims to show how linguistics was one of the tools used by Lacan to reflect upon the subject. It is not the researchers' intention to promote homogenization among the fields nor to interpret this encounter as the only possible one.

In this sense, it is valid to emphasize that structuralism, applied to linguistics, operates a reduction of sensitive qualities and not its total abolition, which is due to the phonetic matter present in this specific field that are especially dependent on sensory organs. However, even so the structural program was consolidated as a method that aimed to promote scientific treatment for its objects.

In this panorama, this question is presented to us: what was the doctrine of science that established scientific coordinates for linguistics? Following Lévi-Strauss in his text on linguistics and anthropology, there is evidence for the prominence of linguistic study in relation to the other areas that responded to the title of social sciences or human sciences. Linguistics was "the one that made the most progress by far; it is certainly the only one that can claim the name of science and that has managed, at the same time, to formulate a positive method and to comprehend the nature of the facts that is fit to analyze" (Lévi-Strauss, 1958/2012, p. 43, free translation).

It was the structuralist program that gave linguistics the title of science, insofar as it relied on a method of reducing sensuous qualities, promoted by an epistemological scope operated by Ferdinand de Saussure. We shall try to make this intelligible by analyzing how the method of reducing the qualities and introducing the facts of language into a system of oppositions is the key to apprehending the nature of the linguistic sign. This argument will be used as a tool to approach the signifier in psychoanalysis and investigate how it correlates with the Saussurian signifier and also to what extent it subverts it by inserting the category of the subject.

The notion of subject, in principle, would prevent the scientific treatment which the structural program aims to promote. However, in Lacan, it will be shown that it is a subject without qualities, contrary to the category due to its self-consciousness, that is, for the psychoanalyst, structuralism has inaugurated "a very special modality of the subject" (Lacan, 1965/1998, p. 875, free translation). We will see how this is established in Lacan's approach to structural linguistics.

The study of the language before Saussure, in short, stated that its function was communication through the formatting of words from the things present in nature. It is to this fact that structural linguistics will rebel against, since, in this perspective, "the linguistic sign unites not a thing and a word, but a concept and an acoustic image" (Saussure, 1916/2012, p. 106). Thus, as Francois Dosse (1991/1993) states, what Saussure promotes is the emergence of a method of reading language that will unify various knowledge based on the approach of the structure and that is constituted from "an interpretation of the language that places it resolutely on the side of abstraction to better separate it from empiricism and psychologizing considerations" (p. 66-67, free translation).

The concept of sign in Saussure, with this, begins to indicate the relationship between an acoustic image and a concept, which we can also call signifier and signified, respectively. The emergence of this epistemological scope in the way of understanding the sign will be supported by two fundamental principles, namely, the principle of arbitrariness and the principle of linear nature of the signifier.

The first principle, according to Saussure (1916/2012), concerns the fact that the relationship established between signifier and signified in the linguistic sign is not necessary but arbitrary. "Thus the idea of 'sea' is not bound by any inner relationship to the sequence of sounds, s-e-a, which is its signifier; it could be represented equally well by another sequence, no matter which it is" (Saussure, 1916/2012, p. 108, free translation).

As an example of this principle, Saussure uses the word *bouef*, which can be translated as 'ox', in English. If the variation of French in other regions is used, one will find signifiers for the word ox as "*b-ö-f* on one side of the Franco-Germanic border, and *o-k-s* (Ochs) on the other" (Saussure, 1916/2012, p. 108, free translation). With this comes the realization of how the principle of arbitrariness repeals any attempt to attribute a natural and necessary relationship between signifier and signified.

As for the principle of the linear nature of the signifier one must understand it based on the fact that "the signifier, as it has an auditory nature, develops over time, uniquely, and has the characteristics that it takes from time: (1) it represents an extension, and (2) this extension is measurable in a single dimension: it is a line" (Saussure, 1916/2012, p. 110, free translation).

What can be deduced from these two principles of the linguistic sign is what is found in Saussure's value theory. The signifier and the signified, or, if you will, the sound and the thought, do not constitute a system of pure values. The phonic substance is not a form upon which thought fits. It is necessary, therefore, to consider sound as an amorphous mass, "a plastic material which, in turn, divides into distinct parts, to supply the signifiers with that for which thought requires" (Saussure, 1916/2012, p. 158-159, free translation).

In this sense, Benveniste (1976, p. 56) states that:

> the signifier and the signified, the mental representation and the acoustic image are therefore in reality the two faces of the same notion and are composed together as the incorporator and the incorporated. The signifier is the phonic translation of a concept; the signified is the mental counterpart of the signifier. This consubstantiality of signifier and signified guarantees the structural unity of the linguistic sign (free translation).

To evidence this is to adopt an abstract posture in relation to language, that is, language is taken from the notion of a system which, in turn, is inapprehensible by observation, but which does not cease to be operative in the whole act of speech. In this sense, there is no direct relationship between signifier and signified, but rather a production of meaning through a game of oppositions.

Take the famous example of Saussure (1916/2012) on the word "*carneiro*" (sheep/mouton) in Portuguese. It is both an animal and a food (when we relate it to the possibility of feeding). Thus, in French, moutton, and in English, sheep, we have the same meaning, but we do not have the same value: while the French uses moutton indiscriminately, English uses the word mouton – not sheep – when it is necessary to refer to a sheep intended as food. This means that "the difference in value between sheep and *moutton* or *carneiro* is due to the fact that the former has a second term at its side, which does not occur with the French or Portuguese word" (Saussure, 1916/2012, p. 163, free translation).

What Saussure's theory of value advocates is the illusion in which one would fall into if we proceeded to analyze the nature of the sign only with respect to the union of a certain sound with a certain concept. If we did so, we would be isolating the linguistic sign of the system to which it belongs, which would be the same as "believing that it is possible to begin with the terms and construct the system by making the sum of them, whereas, on the contrary, it is from the total that one can obtain, by means of analysis, the elements that it contains" (Saussure, 1916/2012, p. 160, free translation).

Based on these outlines, the linguistic signifier in Saussure is by no means taken by substantiality: it is incorporeal, devoid of intrinsic properties, and can only be apprehended as that which is constituted from a set of oppositions with other signifiers. It is here that it is propicious to bring to light Lacan's axiom, borrowed from Roman Jakobson (1974), and presented at the seminar on psychoses: "the signifier, as such, means nothing" (Lacan, 1956/1985, p. 209, free translation).

What Lacan promotes by bringing the signifier stripped of properties into the analytic experience is related to, to a certain extent, his concern in regards to the relationship of psychoanalysis with the field of science and its consequent detachment from the tendencies of naturalization of the unconscious. This is what is observed in modern physics, for example: the signifier does not fulfill the function of signification there. Thus, Lacan warns: "you will be wrong to believe that the small formulas of Einstein that relate the mass of inertia to a constant and some exponents have the least significance. It is a pure signifier" (Lacan, 1956/1985, p. 211, free translation).

Lacan, in response to Freud, provides a key to reading by pointing out that what is relevant to the experience of psychoanalysis is not the search for significations, but rather the prevalence of signifying materiality, rebellious to any rigidity coupled to meaning. Thus, "the sense of analytic discovery is not simply that it has found significations, but rather that it has gone much further than it has ever been in its reading, even the signifier" (Lacan, 1956/1985, p. 225, free translation).

In this regard, it would be up to psychoanalytic theory, using the science of linguistics, to delimit the general laws that govern the status of the signifier. It is here that this article refers to Saussure's theory of value to indicate that the signifier, deprived of intrinsic value, can only be perceived in a game of oppositional relationships:

> the signifier-man as the signifier-woman are different things from a passive attitude and active attitude, aggressive attitude and giving attitude, something other than behaviors. There is undoubtedly a signifier hidden there behind them which, of course, is absolutely nowhere incarnable, but is incarnated in the fairest way possible in the existence of the word *man* and the word *woman*. (Lacan, 1956/1985, p. 226, our highlights, free translation)

Thus, the axiom "the signifier, as such, means nothing", it indicates the "fact of being in itself without its own signification" (Lacan, 1956/1985, 227, free translation), that is, the signifier does not lend itself to the production of identity, but only and exclusively to the production of difference. Lacan will find in Jakobson's (1974) developments what concerns the reading of the phonemes that are given not by the materiality itself, but by its logical opposition, insofar that the given phoneme would make the presence of another that opposes it unavoidable.

Now, is there not a point of compatibility with the so-called modern science which, in turn, operates in the world an emptying of substance? We may be allowed to answer affirmatively if we take into account that mathematical physics becomes its major reference. According to Marco Antonio Coutinho Jorge (2000/2008), Lacan's encounter with linguistics is part of a "quest for scientificity by psychoanalysis, conducted by Lacan in a *very particular way*, that is to say, in situating the question of the subject of the unconscious in a new way" (p. 69, our highlights, free translation). Let us see that, in approaching linguistic structuralism, Lacan did not seek to frame psychoanalysis in a restricted scientific program, but rather to delimit the coordinates of his object: the subject of the unconscious.

To make this attempt possible, it was necessary for the psychoanalyst to subvert Saussurean linguistics at two fundamental points: inserting the category of subject in the linguistic sign and giving primacy to the signifier in the linguistic sign.

The subject without the qualities of psychoanalysis

The subversion that Lacan promotes in the Saussurean linguistic sign is what leads us to affirm that the Lacanian signifier is not homologous to the Saussurean one. As is true in the first argument, if, for Saussure, the advent of the signified in the linguistic sign must be inserted in his theory of value, indicating that phonic matter, amorphous by nature, and thought, also amorphous and indistinct, then it relates to an arbitrary

principle – "it is, in fact, rather about the *mysterious* way, that 'thought-sound' uses divisions and that the language elaborates its units constituting itself among two amorphous masses" (Saussure, 1916/2012, p. 159, our highlights, free translation), for Lacan, one can apply the activity of the subject of the unconscious to this mysterious one.

Paul-Laurent Assoun (1996) asserts that it is precisely at this point that Lacan returns to Freud, who establishes an epistemological conjugation between Freudian metapsychology and Saussure's structural linguistics. However, what is structured is a connection that is not intended to include psychoanalysis within linguistic theory or vice versa. This issue can be summarized in the following clause:

> it is, therefore, necessary to carefully determine the precise point at which the contribution of psychoanalysis is legitimated and where the need to involve it in a debate whose terms, at the beginning, does not define, but whose plots it re-finds through its own means. (Assoun, 1996, p. 77, free translation)

It is in this way, it is regarding the subject's insertion in the field of linguistics, that Lacan, during his seminar More, would propose a split with the linguist Jakobson, founding the neologism linguisteria, a proper psychoanalytic field, inasmuch as it is not a question of something other than to prioritize the Freudian discovery: the subject of the unconscious. Thus:

> if we consider everything that, by the definition of language, deals with the foundation of the subject, so renewed, so subverted by Freud, it is then that everything is guaranteed, which was said by their mouth as stated by the unconscious, then it is necessary, to leave Jakobson to his reserved domain, to forge some other word. I'll call it linguisteria. (Lacan, 1972/2008, p. 22, free translation)

Articulated to this, the second axiom of Lacan can be mentioned – "the signifier is what represents the subject to another signifier" – and emphasizes in it the subversion that works by isolating the primacy of the signifier in the linguistic sign of Saussure that, as such, does not have an intrinsic reality and the insertion of the subject between signifiers is stripped of qualities.

The algorithmic representation of the linguistic sign that Saussure (1916/2012, p. 161) provides is: signified/signifier; in which signified over signifier can be read. As it is known, what promotes Lacan is his inversion, giving greater value to the signifier. In his work *The instance of the letter in the unconscious or the reason that since Freud*, Lacan (1957/1998, p. 500) adopted the Saussurean algorithm on its backside: "S/s, i.e.: signifier over signified, corresponding the "over" to the bar separating the two steps". Thus:

> the unconscious is, in its depth, structured, woven, chained, a fabric of language. And not only does the signifier play a role as great as the signified, but it plays an essential role in the theory. What in fact characterizes language is the system of the signifier as such. The complex game of signifier and signified poses questions on the verge of which one holds oneself, as a linguistics course is not proposed in this article; however linguistics has been given a great deal of thought up to now so that the relationship of the signifier and the signified is far from being, as stated in the set theory, biunivocal. (Lacan, 1956/1985, p. 139, free translation)

Therefore, this article has reached the fact that the subject of the unconscious is comprehended as the consequence of the signifier games. Lacan is promoting the emergence of a subject without qualities, which are so dear to Freud's discovery and very different from the philosophical and psychologizing aspects. If, as previously mentioned, it is in the nature of the signifier, when interpreted as such, to mean nothing, by allocating the subject among signifiers, as in Lacan's axiom (1960/1998). That is, we are saying that there is no signifier that can handle promoting the assumption of what the subject is, of what it is composed of, by rebelling against any attempt to substantiate it.

What is established, therefore, in relation to the articulation between Lacan's two aforementioned axioms can be linked to the thesis that the subject of psychoanalysis and the subject of science are compatible: both are devoid of qualities. This is why the Freudian discovery was only possible in a world in which the subject was inaugurated by the Cartesian cogito affected by scientific activity. It is in this sense that the status of the subject will be "at the core of difference" (Lacan, 1965/1998, p. 871); signifying difference; a subject that is in the range of S1 (the master signifier) and S2 (the battery of signifiers). Such demonstration is structured based on Lacan's implication in the debate with structural linguistics.

With this, in conclusion, before we ask ourselves if psychoanalysis fits into the ideal of science, we see in its theoretical construction a path that has logical compatibility with the way that modern science guides its field of problems. Thus, it is not a matter of homogenizing psychoanalysis and science, but rather following in the footsteps of Lacan, who claims that the emptying of qualities operated by modern science is the condition that enables the emergence of the subject of the unconscious inaugurated by Freudian metapsychology.

However, we still have one question that we want to leave in the open to raise a field of investigation about it: considering the articulation that Lacan proposed between psychoanalysis and science during his teaching, can we transpose it as it is nowadays? What is the situation of psychoanalysis with science nowadays? How does it fit into the scientific debate that is so intensely present in

the university sphere? The debate over the DSM and ICD nosographic classifications, the emergence of new fields of scientific problems present in psychology, mainly in cognitive-behavioral psychology and its highly evidence-based field of research, with new technologies, leads us to question what position psychoanalysis occupies in this debate. Thus, with the path that we have developed here, we do not intend to empty it and close it down, but rather to set the coordinates for a debate that is about to take place every day, just as psychoanalysis reinvents itself at every clinical meeting.

Psicanálise e ciência: a equação dos sujeitos

Resumo: Pretendemos demonstrar que a afirmação de Jacques Lacan de que a ciência moderna foi a condição de possibilidade de surgimento da psicanálise deriva um conjunto de proposições: há ciência moderna; a psicanálise só pôde surgir na modernidade do pensamento; e entre psicanálise e ciência há uma lógica de compatibilidade. Para tanto, a partir da epistemologia procuramos definir o estatuto de um mundo afetado pela atividade científica moderna em oposição a um mundo antigo. Isso nos levou à axiomática do corte maior decorrente do pensamento de Descartes e da física matematizada, que propõe haver uma cesura que afeta todos os discursos compossíveis. Com a matematização do pensamento, as qualidades do existente são abolidas, fornecendo terreno propício para o surgimento do sujeito do inconsciente, que Lacan irá alocar entre significantes, promovendo uma teoria do sujeito essencialmente moderna.

Palavras-chave: psicanálise, ciência, sujeito, significante.

Psychanalyse et la science: l'équation des sujets

Résumé: Notre but est de démontrer que l'affirmation de Jacques Lacan qui dit que la science moderne a été la condition à la naissance de la psychanalyse résulte dans un certain nombre des propositions : il y a la science moderne ; la psychanalyse ne peut que surgir dans la modernité de la pensée ; et il y a entre la psychanalyse et la science une logique de compatibilité. Pour cela, à partir de l'épistémologie, nous avons cherché à définir le statut du monde affecté pour l'activité de la science moderne par opposition à un monde ancien, ce qui nous a amené à l'axiome de la coupure majeure de la pensée de Descartes et de la physique mathématique, qui propose l'existence d'une rupture qui touche tous les discours. Avec l'introduction de la mathématique dans la pensée les attributs de l'existant sont abolis et a laissé une place propice à l'apparition du sujet de l'inconscient que Lacan met entre les signifiants, ce qui a promu l'émergence d'une théorie moderne du sujet.

Mots-clés: psychanalyse, science, sujet, signifiant.

Psicoanálisis y ciencia: la ecuación de los sujetos

Resumen: Pretendemos demostrar que la afirmación de Jacques Lacan de que la ciencia moderna fue la condición de posibilidad de surgimiento del psicoanálisis constituye un conjunto de proposiciones: hay ciencia moderna; el psicoanálisis solo ha podido surgir en la modernidad del pensamiento; y entre el psicoanálisis y la ciencia hay una lógica de compatibilidad. Para tanto, desde la epistemología, tratamos de definir el estatuto de un mundo afectado por la actividad científica moderna en oposición a un mundo antiguo. Esto nos llevó a la axiomática del corte mayor resultante del pensamiento de Descartes y de la física matematizada que propone haber una censura que afecta todos los discursos composibles. Con la matematización del pensamiento, las cualidades de lo existente son anuladas, estableciendo el campo propicio para el surgimiento del sujeto del inconsciente, que Lacan situará entre significantes, promoviendo, así, una teoría del sujeto esencialmente moderna.

Palabras clave: psicoanálisis, ciencia, sujeto, significante.

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