

Article in press

THE DEMARCATION PROBLEM. SCIENCE, PSYCHOLOGY, AND PSYCHOTHERAPY

José Ramón Fernández Hermida
Universidad de Oviedo

La polémica sobre la naturaleza científica de la Psicología tiene que ver necesariamente con la idea de ciencia y con los criterios que sirven para demarcarla. Se pasa revista a distintas ideas filosóficas sobre la ciencia con sus respectivos criterios de demarcación y se defiende la pluralidad de las ciencias, que no son reducibles unas a otras. La Psicología se concibe, así mismo, como una ciencia plural, en tensión entre las ciencias naturales y humanas, en la que el desarrollo histórico aún no ha llevado a un monismo teórico ni metodológico. Esta pluralidad es la fuente de la dificultad para desarrollar un criterio de demarcación tanto para la Psicología, como para la psicoterapia. Finalmente se analizan los problemas para establecer los criterios de demarcación para la Psicología y la psicoterapia, y se proponen los principales aspectos que se deben tener en cuenta a la hora de construirlos.

Palabras clave: Problema de demarcación, Filosofía de la ciencia, Psicología, Psicoterapia.

The controversy over the scientific nature of psychology necessarily has to do with the idea of science and the criteria that demarcate it. Different philosophical ideas about science are reviewed with their respective demarcation criteria, and the plurality of the sciences—which are not reducible to each other—is supported. Psychology is also conceived as a plural science, in tension between the natural and human sciences, and in which historical development has not yet led to theoretical or methodological monism. This plurality is the source of the difficulty in developing a demarcation criterion for both psychology and psychotherapy. Finally, the problems in establishing the demarcation criteria for psychology and psychotherapy are analyzed, and the main aspects that must be taken into account when constructing them are proposed.

Key words: Demarcation problem, Philosophy of Science, Psychology, Psychotherapy.

In 2019, the relatively unsettled waters of Spanish psychology were further agitated as a result of the initiative of the Ministry of Health to draw up a list of false therapies or pseudo-therapies, within a «Health Protection Plan» promoted by the aforementioned ministry together with the Ministry of Science, Innovation, and Universities. The most relevant, but probably not the only, reason for the nervousness produced was the response that the professional organization gave to the document presenting the plan. The text included the following sentence: «It should be pointed out that, in the field of psychological therapies, what is considered to be based on scientific evidence should be updated, since some of the treatments that can be considered pseudo-therapies can provide proven benefits for the health of patients, when used correctly by professional psychologists within the framework of an appropriate therapist-patient relationship» (Spanish Psychological Association, 2019b).

Following this statement, some psychologists understood that the association was defending the use of psychological techniques or therapies with no scientific basis. This led the association to issue a statement that rejected outright the use

of therapies without empirical evidence, supported the «Health Protection Plan» against pseudo-therapies, highlighted the difficulties inherent in drawing up lists of psychological techniques not based on scientific rationality, and offered its collaboration to the authorities to achieve this objective (Spanish Psychological Association, 2019a). Then nothing relevant happened, either officially or unofficially.

At the heart of this debate is the issue of the nature of scientific rationality and how we can know whether a psychotherapeutic intervention incorporates it or not. Sometimes Wittgenstein's aphorism, which appears in his *Tractatus Logico Philosophicus*, has been cited, stating that what can be shown cannot be said (4.1212). This aphorism refers to the property of language that allows us to refer to complex concepts by showing what they are, without being able to define precisely, through a set of necessary and sufficient properties, what their exact delimitation is. These complex and blurred concepts are not atomic facts verifiable by experience. We can see the concept of science contained in this conceptual category, formed by similar phenomena with a family resemblance (Pigliucci, 2013). This means that it is easier to show what is not scientific than to indicate why, that is, to offer a definition of science that contains all the necessary and sufficient conditions to characterize a discipline as scientific. Answering the question of whether a psychotherapy has scientific foundations requires having some

Received: 9 June 2020 - Accepted: 24 June 2020

Correspondence: José Ramón Fernández Hermida. Universidad de Oviedo. Plaza Feijoo s/n. 33003 Oviedo. España.

E-mail: jrhermid@uniovi.es

Article in press

previous assumptions clear, such as whether there is one science or several, whether it is possible to establish a demarcation criterion between science and non-science, what type of science is or supports psychotherapy and on what basis the scientific demarcation criteria of psychotherapeutic activity can be built.

Of course, the controversy generated in Spain is not an isolated case. A significant number of psychologists consider that clinical practices should be adapted to the scientific evidence, and that clinical judgment and experience should be exercised within the field of information provided by scientific methods. Of these, the randomized clinical trial (RCT) is an essential reference. It has sometimes been called the gold standard (Machado & Beutler, 2017; Tackett, Brandes, King, & Markon, 2018), although this is an expression that can be rejected because it gives an idea of infallibility, and that is not what is defended (Lilienfeld, Lynn, & Bowden, 2018). On the other hand, there is a perspective maintained, tacitly or explicitly by a good number of psychologists, which gives pre-eminence to clinical judgement and personal experience and questions the usefulness of RCTs in guiding therapeutic action on a specific case. This position was already observed more than half a century ago by Meehl (1954), who pointed out the need for statistical judgement, as a complement to clinical judgement. According to these critics, RCTs give extraordinary priority to internal versus external validity, and the consequent generalization of results (Tackett et al., 2018). In some cases, it is pointed out that RCTs are normally conducted following the bio-medical model, which seeks specific treatments for discrete disorders. This path has been repeatedly seen as not very productive, as is the case, for example, with trauma, where it has been proven that all «bona fide» psychotherapies obtain the same results, and where the technique has little impact on effectiveness (Norcross & Wampold, 2019). In other cases, it is argued that RCTs are limited because they seem to start from the false assumption that the (manualized) technique is independent of the participants and the therapeutic relationship (Wampold & Imel, 2015). Furthermore, it is argued that RCTs are not neutral and that they are more likely to settle on results that are more in line with the technique's assumptions (Freire, 2006). The reality is that, as has been denounced by the defenders of a psychology based on scientific evidence (Lilienfeld, Lynn, et al., 2018), a significant number of clinicians base their evaluation and intervention practices fundamentally on their clinical experience and subjective judgment, paying no attention to the best scientific evidence available on the efficacy and validity of psychological techniques.

It should be mentioned that, in many cases, the belligerence of the contenders does not lead to the complete denial of the other's reasoning. Thus, supporters of RCTs are fully aware of the shortcomings noted and they go so far as to paraphrase Churchill's phrase that RCTs are the worst method to use if we exclude all others (Lilienfeld, McKay, & Hollon, 2018). While

the critics do not exclude the use of RCTs, they rather expose their present limitations and claim to focus attention on variables of greater importance for psychotherapeutic action.

In addition to these two positions, one focused on the scientific evidence produced by RCTs, and another criticism, more inclined to give weight to experience and clinical judgment, there is a third position, which we will mention for inventory purposes, very briefly. This position seems to mix the required qualification for the exercise of an activity, in this case, psychotherapy, with the adjustment of practice to criteria based on scientific evidence. In summary, the position is that the axis of the discussion on the scientific nature of psychotherapy, and the fight against pseudo-therapies, lies in determining whether the qualification of the person carrying it out is sufficient for a state or corporation. In Spain, it is said, with ignorance of the existing professional and legal situation, that only psychologists specialized in clinical psychology and specialists in psychiatry can practice psychotherapy and that such a restriction would help in the fight against pseudo-therapies (Bertolín Guillén, 2020). It is evident that such a merely administrative criterion leads us through paths completely alien to the philosophical discussion on the demarcation criteria that should demarcate science-based psychotherapy. Assuming that such a legal restriction is true—which it is not, given that no intervention of a psychological nature, psychotherapy included, is an exclusive activity of specialist psychologists (see Judgment of the Spanish High Court of 3/10/2016 on appeal 361/2013)—its application could be based, like any political measure, on the fact that it is prudent to restrict the performance of certain activities to duly trained professionals. However, such a limitation does not guarantee, per se, the scientific basis of the activity actually carried out.

In addition to what has been said so far about the rational basis on which the demarcation criterion should be based, there is the important question of the reproducibility of the results of psychological experiments. Since clinical trials of psychological problems can be considered a type of psychological experiment, it is worth asking whether this model, coming from medicine, is fully applicable to psychology, if we take into account the difficulty in reproducing results in the psychological field, and how this difficulty affects the status of psychology, as a science, and, therefore, of psychotherapeutic activity as a scientific activity. It is not a question here of problems of organization or publication, as can be inferred, when solutions are proposed to improve the replicability of clinical research, such as the need for the instruments, protocols and procedures used together with the data obtained to be public and subject to scrutiny, for inferential biases to be avoided by pre-registering trials, or even reports, or for multi-site work to be encouraged (Tackett et al., 2018). Rather, it is a question of determining whether psychological science has the necessary conditions to support the idea that the phenomena observed, in a given

Article in press

context and by a given observer, can be reproduced in similar contexts by other independent observers, as is presupposed in the natural sciences. If this is not the case, then the usefulness of clinical practice guidelines—in which recommended treatments are listed, depending on prior diagnosis—may be highly questionable. The reason is that these clinical guidelines would not be reflecting the relationship between discrete natural phenomena and operations that are independent of the observer, but rather the relationship between interactive and historical dimensional phenomena (Varga, 2015) and operations that are completely dependent, in their results, on knowledge of the aims and purposes of the operations being performed. Hence, the importance is stressed of including those intervening and the therapeutic relationship in the equation (Wampold & Imel, 2015).

The movement to base clinical practice on scientific evidence has as its essential preliminary premise the delimitation of the notion of science and the establishing of the distinction between science and non-science. The ideas about what is science and what distinguishes science from non-science are thus essential to decide whether it is possible to distinguish between practices of clinical psychology based on their scientific foundation, and therefore whether it is feasible to elaborate the criteria that enable the creation of a list of the pseudoscientific practices or pseudo-therapies in clinical psychology.

In this article, I intend to analyze initially the nature of the concepts of science and of the demarcation criterion, from a philosophical perspective, pointing out the implications that follow from a critical analysis of these ideas.

THE IDEA OF DEMARCATION IN SCIENCE

Demarcation in science consists of establishing a criterion that allows us to elucidate whether a discipline or a proposition is scientific or not. In the field of health, there is a clear need to achieve clarity in determining what science is and what it is not, due to the prestige that science achieves in our society and the imperative to protect the public from professional malpractice and to allocate the scarce resources available rationally.

However, the application of this demarcation criterion is not simple in any case, whether experimental or exact sciences, natural or human science, or science of any kind, since the idea of science that one has must always be elucidated first. That is, it must be seen what kind of characteristics science has that make it perfectly distinguishable from other types of knowledge or activity, whether there is one science or many sciences; if there are many it must be determined what type they are and how they relate to the general concept of science, and so on. It does not make sense to talk about what is or is not scientific, if we do not know how to define what science or the sciences are with a degree of clarity.

In addition to knowing what we mean by the idea of science, according to Laudan (Laudan, 1983), the

demarcation criterion to be established must meet certain requirements in order to be effective: 1) the criterion must give an explicit and reliable account of the current intuitive classification of what is or is not science. That is to say, it must be sensitive to the current conceptions of what is or is not scientific activity, without prejudice to the fact that there may be borderline situations that are situated on one side or the other by the reasoned application of the criterion. Any demarcation criteria that would situate voodoo as a form of scientific psychotherapy or that would catalogue physics or chemistry as pseudosciences is unacceptable; 2) it should have a necessary and sufficient set of premises that allow the demarcation. If the premises of the demarcation criterion are only necessary, but not sufficient, then doubt would be created regarding the activities or science to be judged, since it has what is necessary, but not what is sufficient to reach the criterion of science. If on the contrary they are sufficient, but not necessary, conditions then the difficulty would be to establish what is non-scientific, since the conditions may be present in one case and not in another; 3) any demarcation criteria should be proposed with full awareness that its implications have important practical consequences.

THE IDEA OF SCIENCE

The idea of science is complex, with gnoseological, epistemological, and social dimensions, among others. It is a controversial and philosophical issue, which cannot refer to the carrying out of empirical verifications.

Historians can trace it back to Aristotle, who distinguished between the episteme and the doxa. The episteme was the reasoned knowledge of the causes of particular facts, tending to the logical search for universals that would condense an eternal and immutable knowledge with apodictic certainty, that is to say, not fallible. It was also the study of causes rather than of how things could be done, the latter being the form of knowledge of technicians or craftsmen. The doxa refers to the common opinion not well reasoned, which together with superstition and technical knowledge are fallible. The idea that science was assimilated to true knowledge, that it was not mutable, was maintained with certain variations until well into the nineteenth century and was supported in one way or another by thinkers such as Galileo, Huygens, Newton, Bacon, Locke, Leibniz, Descartes, and Kant. From the Aristotelian perspective, scientific knowledge was distinguished for being general and universal, absolutely true and of an explanatory-causal nature (Nickles, 2006). These were the criteria for demarcation.

It is clear that the criterion of the infallibility of science, and therefore the eternal nature of its knowledge, has not received prestige from scientists or philosophers of science since the mid-19th century. Wikipedia even states that «scientific opinions can be partial, temporarily contingent, conflicting, and uncertain» (Wikipedia, 2020). The cause is the triumph of fallibilism which, unlike the Aristotelian

Article in press

position, sees as a distinctive feature of science not so much its eternal and unchanging character, but, on the contrary, its capacity to self-correct. According to fallibilism, scientific thought can also be amended, and that is its most outstanding characteristic, since it is always subject to revision. The thinkers who promoted it were Peirce, Comte, Helmholtz, and Mach, who began to identify methodology as the hallmark of science (Laudan, 1983). They began to talk about the scientific method as a criterion for the demarcation of science. The problem was—and is—to get the scientific community to agree on what the scientific method is (a protocol or procedure? the application of a particular logic? a system of verification that transcends the particular sciences?) and on its unity (what is the relationship between the multiple methods of the different sciences?) A no lesser problem is that if fallibilism has the scientific method as its fulcrum, we must realize that nothing exempts this method from fallibility. As Yela (1996a) says (p. 355): «that method is debatable, of course and precisely because it is scientific». This necessarily leads us to consider that the demarcation criterion must be situated before the method, perhaps in a form of refinement of rational thought, albeit not being easy to define or delimit this idea.

If the procedure or the method, understood as the fallibilists saw it, was not enough, then a way of dealing with the problem of delimiting what science is can be situated in scientific language itself, and more specifically in the formulation of its problems or hypotheses, and not so much in the existence of precise rules for understanding reality. The arrival of the positivist vision initially conceives science as a mere description or exact reflection of reality. This position is called radical descriptionism. According to this perspective, science must construct its hypotheses, theories, or models in such a way that they can be empirically verified. In order to do so, there must be an empirical method to decide whether its proposals are true or false; if no such method exists, it is a pseudo-proposal devoid of meaning. In other words, science is, in that sense, fundamentally a method for building hypotheses and verifying them, and the demarcation criterion is the presence of significant verifiable proposals and the existence of a method of verification.

In psychology, operationalism or the insistence on constructing operational statements, that is, in such a way that by carrying out the appropriate operations they can be verified, is in the trajectory of this tradition.

However, the verificationist position presents significant problems. The first is that it breaks with the initial condition for constructing a demarcation criterion, which has been mentioned above, since the mere existence of a verifiable proposal and a method for solving it does not eliminate the possibility of labeling such anti-scientific expressions as «the earth is flat» or «vaccines are harmful to humanity» as scientific. «Flat-earthers» and «anti-vaxxers» are not scientists, but their claims are nevertheless verifiable, and there are

methods for doing so. It must be taken into account that according to the positivists what is important is the proposal analyzed, and not the history of empirical support that it has.

Verificationism relies on induction to know the truth. Every verified fact points to a general law, which, on the other hand, can never be known, since the existence, at some point, of a fact contrary to existing theory cannot be excluded. Through the inductive method with which positivist science operates, it is not possible to know the truth, but at most a more probable truth. This means that verificationism has universal laws as its limit, which compromises the most important laws of current physics or chemistry.

In summary, the demarcation criteria promoted by verificationism neither exclude anti-scientific theories, nor do they necessarily include the more consolidated sciences.

Within the positivist wave, the Popperian perspective changes the verificationist objective, for falsificationism (Popper, 1935-2002). It is not so much a question of verifying the meaning, as of knowing whether the meaning is falsifiable. Science begins with the problem, proposes theories, and tries to find a way to refute them. If there is no possible refutation then the theory is not scientific. The criterion of demarcation is of a logical-formal nature. This criterion of falsifiability starts from the assumption that there is a science, which attempts to discover the truth by eliminating erroneous ideas or concepts.

As in the case of verificationism, Popper's position presents the serious problem that it is unable to separate scientific ideas, fully established in the scientific community itself, from non-scientific ones. The possibility that scientific formulations can be verified as false seems necessary, but it is not sufficient. Many proposals that derive from non-scientific positions are falsifiable (e.g., there may be methods to prove that certain «magic» rituals cure a tumor or eliminate a certain suffering), but that does not make them recognized as scientific hypotheses.

For Bunge (2000) science is a style of thought and action governed by naturalism, rationality, and fallibilism. It is characterized by being constituted by the scientific method (taken in a generic way and not as a recipe) and by the objective of science. The method, defined by a logical and systematic set of rules, is composed of a series of operations, which do not have a sequential character. These include the following: enunciating well formulated and plausibly fecund questions; arbitrating conjectures (founded and contrastable by experience) to answer the questions; deriving logical consequences from these conjectures; arbitrating techniques for testing the conjectures, and testing these techniques for the relevance and faith they warrant; conducting the testing and interpreting the results; assessing the claim to truth of the conjectures and the fidelity of the techniques; and determining the domains in which the conjectures and techniques are valid as well as formulating new problems arising from the research.



Article in press

The goal of science is to obtain objective knowledge of the world. The world is the material world, which must not be understood in a reductionist way. For Bunge, the material is not reduced to the corporeal matter, but rather there are other kinds of matter. Method and objective constitute the difference between science and non-science. If the object is not material or the thinking style is not scientific, then it is not a science.

In the case of Bunge (2011), the demarcation criterion applied to science is complex, since in addition to being shaped by the style of thought, mentioned above, and the material nature of its objective, it is necessary to add the testable and predictive nature of its statements, the intelligibility and correctness of its results and conclusions, as well as its compatibility with the whole of the preceding scientific knowledge.

Analysis of the social influence on a cultural product such as science can be found in Kuhn's work (1962-2004). This author offers a vision of science governed by paradigms (whose definition is not very precise), which follow one another according to the evolution of science itself (paradigms die when theories cannot account for the facts) and the interests of groups of scientists. The nature and evolution of science is better explained by analyzing the social forces that drive it than by focusing on its nature, objective, or method. Here the demarcation criterion has a main component of a social and psychological kind (when do scientists who work in normal science make the decision to enter a revolutionary period, or take up beliefs that place them outside of science?), and it leaves aside a gnoseological or epistemological analysis.

Finally, within this brief excursus on the main ideas of science and their corresponding demarcation criteria, there is Gustavo Bueno's perspective of philosophical materialism (Bueno, 1995), which is not easy to summarize in a few words.

First of all, it should be noted that for this philosophical approach what is called science is not a unit, but is preached from a set of scientific knowledge (or sciences) organized in the form of fields that have as their object material categories and as subjects the scientists operating within them. The sciences are studied as a rational activity applied to certain fields of reality, which are formed by categories. Categories are ontological ideas that have as their purpose the classification and ordering of reality, according to certain characteristics such as their immanence and their delimited nature, such that they cannot be classified by another category. These fields of reality, which are not static but dynamic, always subject to the judgment of reason, are both pre-existing to the sciences themselves and a consequence of the scientists' own actions. The pre-existing fields are dominated by the technologies represented by the various trades. The fields created are produced as a consequence of the very scientific activity that closes the field. In these fields, there are concepts, ideas, elements or objects, instruments, procedures, relations between the different terms of the field,

and operative subjects. The process of closure occurs as a consequence of the subjects who operate with the terms of the field producing new terms that are within the same field. For this philosophical perspective, a science is a science to the extent that as a consequence of the operations within the field, objective truths can be established. According to this perspective, one could enumerate certain distinctive features of philosophical materialism:

1. The sciences are not eternal, but are complex human material constructions, which have a historical character.
2. Science is not unique, but rather there is a plurality of sciences. This plurality is made up of sciences, which, as far as we are concerned, include those known as the human sciences, which have human behavior as their object of study, as opposed to the natural sciences, which exclude it. In fact, the most radical difference between these types of science is in the type of relations, which they study, within the terms of their scientific field. The natural sciences work with relations of contiguity—paratetic, physical-chemical—, while the human sciences, such as psychology, economics, or sociology, work with relations at a distance—apothetic, phenomenal, perceptive, behavioral—(Fuentes, 2019).
3. Science is not an activity solely linked to the matter or the terms of the field, nor solely linked to the subjects operating within it. It is the result of the operations that take place in the field.
4. Science produces scientific truths that cannot be judged independently of the operations performed in that field, and therefore must be judged relative to the operations, operators, and relationships established in it. There is no scientific truth that is not linked to the ideas and instruments that construct it.

According to this position, the essential demarcation criteria for determining the existence of a science would be that its field of study is a category of material reality and that the operations that take place within that field can lead to the establishment of objective truths. This does not exclude the fact that historical and social reasons may also influence the constitution of the sciences, given their nature of historical and social construction.

IS A DEMARCATION CRITERION POSSIBLE WITHIN THE PLURALITY OF SCIENCES?

Laudan (1983), in response to the positivist wave, concluded that the establishment of a demarcation criterion was an impossible undertaking, due to the evident epistemic heterogeneity (there is no single scientific method) of the activities and beliefs that are usually understood as scientific.

So, if an epistemic demarcation is not possible, what kind of demarcation is possible?

Laudan warns that the difficulties in arbitrating a demarcation criterion do not mean that it is irrelevant to analyze when a statement is well-confirmed, when a theory is



Article in press

corroborated, or what the distinction is between reliable and unreliable knowledge.

Pinker, in his defense of enlightenment (Pinker, 2018), says that what distinguishes science is the belief that the world is intelligible, meaning that the phenomena we experience can be explained by principles that are deeper than the phenomena themselves, and the idea that we should let the world tell us whether our ideas about it are correct or not (i.e., Popperian falsifiability). These premises may be necessary, but they are certainly not sufficient.

One way to overcome the problem posed by Laudan, is to analyze the nature of science beyond the epistemological perspective and to recognize that science is a rational human activity in which all the elements that make it up, not just the supposed method, are relevant in its study. This implies adopting a vision that fits the plurality of the sciences that really exist, in which the demarcation criterion is a complex algorithm in which all the elements of a scientific field come into play, both material and formal.

The use of a rationality that is particularly sophisticated, but not qualitatively different from common reason, which allows us to understand how the different methods contribute to the achievement of «scientific truth», must be associated with considerations about the material nature of the category under study, the existence of concepts, ideas, or constructs specific to that categorical field, the existence or not of a scientific community formed by researchers, practitioners, institutions, and the media (congresses, manuals, journals), the assessment of the objective knowledge that is being developed and its compatibility with that developed in other fields of knowledge, and many other aspects. This is what I mean when I refer to a complex algorithm.

However, it is far from the purpose of this article to offer a solution to this problem of demarcation in science. It is enough for me to point out the insufficiency of simple solutions, to point out the need for the gnoseological diversity of the sciences to be taken into account, and to underline the need to adopt demarcation criteria adjusted to the scientific field to be addressed.

THE TWO «SOULS» OF PSYCHOLOGY

From its own genesis as a discipline (about which there is also discussion), there are diverse conceptions or opinions about whether psychology is a science and, if it is, when it began to be called a science and what type of science it is.

The historian of psychology, Kurt Danziger, believes that psychology, as a modern scientific discipline, was born in the 18th century by the British empiricists, such as Hume, who saw the mind as a machine that could and should be explained in an individual, who took center stage, to the detriment of God, tradition, society, religion, etc. The previous view was philosophical, religious, ethical, or medical, but not psychological (Brock, 2006). The vision of empiricism, which sees the mind as an object of study, has before it the

rationalist and skeptical position of Kant, who defended that psychology would never be a science because it was impossible to apply mathematics to psychological processes (Sturm, 2006) as they cannot be measured nor can they be the object of experimentation.

William James warns, on the last page of his book *Psychology, The Briefer Course*, that when we speak of psychology as a natural science, let us not assume that it is based on solid foundations, but rather we must take into account its fragility. This leads him to affirm that psychology can be seen as «A list of basic facts, some gossip, and conflict about simple opinions, some merely descriptive classifications and generalizations, a strong prejudice that we have mental states conditioned by our brain, but not a single law of the same style as there is in physics, no proposition from which one can causally deduce consequences... This is not a science, it is only a hope of science» (James, 1892-2001).

Abstracting the currents before the birth of scientific psychology, if we agree that its constitution as such is at the end of the 19th century with Wundt, it can be said that from the moment of its inception there were already crises. With Wundt the two cultures of psychology were born, which have been seen as two approaches to the world similar to those proposed by Snow (1959-2012), who was not a psychologist, but a scientific novelist. For Snow there were two antagonistic and opposed visions of the world: the scientific one and the humanist one. In this respect, it is of some interest that psychology has sought to corroborate, in an empirical way, the suitability of this classification. Kimble (1984) found that the psychologists within the Division of Experimental Psychology of the APA tended to identify more with the first term of dichotomies as opposed to the humanist psychologists and psychotherapists, who identified more with the second. The dichotomies referred to the following dimensions: the most important academic values (scientific vs. humanistic), the predictability of behavior (deterministic vs. non-deterministic), the basic source of knowledge (observation vs. intuition), appropriate location for the research (laboratory vs. case or field study), the generality of laws (nomothetic or ideographic), and the appropriate level of psychological analysis (atomism vs. holism).

The two cultures already exist in the father of psychology himself. There is an experimentalist Wundt, who seeks to contradict the Kantian impossibility of measuring internal psychological events and who has his continuity in Ernst Heinrich Weber and his studies of the sense of touch and proprioception. The first quantitative law in the history of psychology refers to the fact that perception is relative and not absolute. That is, that perception is not a simple one-to-one reflection of physical reality, but that there are laws that can relate one to the other. This was completed by Gustav Theodor Fechner, the founder of psychophysics. Both Wundt and Fechner showed that it was possible to measure mental phenomena and relate them to physical ones.

Article in press

This experimentalist Wundt is a contemporary of the new physiology, with its experimental roots, which bases the psychological on the physiological. A physiological-mechanicist approach that is represented by authors such as Johannes Müller, who says categorically that «No one can be a psychologist, unless he first becomes a physiologist» or Herman Von Helmholtz who also states that «No force other than the common physical-chemical ones are active within the organism. In cases which, at this time, cannot be explained by these forces, one has to either find the way or the form of their action by means of the physical-mathematical method, or assume new forces of equal dignity to the physical-chemical forces inherent in matter, reducible to the forces of attraction and repulsion» (Hergenhahn & Henley, 2013). These are materialist-mechanicist statements that challenged the idea that forces alien to matter, such as animal spirits, operate in the organism.

Brain research, at that time, reached important milestones in the holistic standpoint of Pierre Flourens in competition with Paul Broca's localizationist perspective.

But against the experimentalist Wundt and the physiological currents, there is also another anti-reductionist Wundt, close to the culturalist theses. Wundt opposed mechanistic reductionism, when he said, «There are no psychological qualities in physics... A musical quality, the taste of wine, or the familiarity of a face is a rapid creative synthesis, which cannot, in principle, be explained as a mere sum of elementary physical characteristics» (Blumenthal, 1998). Wundt's goal was to understand the mental laws that govern the dynamics of consciousness, and here the concept of will was of particular importance. It could be said that for Wundt the central problem of psychology was to understand propositional acts, associated with the will. In fact, according to Blumenthal (1975), Wundt explains that the physical sciences describe the act of greeting a friend, eating an apple, or writing a poem in terms of the laws of mechanics or physiology. Moreover, no matter how detailed or complicated we make such distinctions, they are not useful as descriptions of psychological events. These events need to be described in terms of intentions and goals, according to Wundt, because the physical actions or forces for a given psychological event can take an infinite variety of physical forms. In one notable example, he argued that human language cannot be adequately described in terms of its physical form, but must rather be described in terms of the rules and intentions that underlie speech. The ways of expressing a thought through language are infinitely variable. To this, Wundt added that experimental psychology could be used to understand immediate consciousness (perception, attention, etc.) but that it was useless to try to understand the higher mental processes and their products. For these, only naturalistic observation or historical analysis was useful. The distinction between a monistic and experimental psychology and a historical and cultural psychology (Völkerpsychologie) was already present

in his book «Lectures on Human and Animal Psychology».

However, Wundt's accused intention of giving natural scientific foundation to psychology brought him considerable backlash. It is enough to remember the controversy with Dilthey (Teo, 2005). Dilthey's rejection of experimentalist psychology is based on his idea that it was wrong for psychology to emulate the natural sciences, since mental experiences cannot be broken down into their fundamental parts and measured. For Dilthey the object of psychology is experience in its entirety. According to his perspective, there are two psychologies: a natural-scientific one, which works with sensation or perception, and another scientific-humanistic one, which has as its object the totality of mental life.

It is clear that there are two psychological cultures because there are at least two ways of dealing with the nature of the psychological act, one naturalistic and the other historical-cultural. In a recent review (Gelo et al., 2020) on the conceptual basis of research on psychotherapeutic practices, it can be observed that one, the one that is closest to natural science-based psychology, is much more prevalent. Nevertheless, the second one is not disappearing. Both are indispensable, and both can be informative. This perspective is closer to what has come to be called methodological pluralism.

Reality in psychology cannot be described in black and white either. In fact, quite a few shades of gray combine naturalistic assumptions and concerns with humanistic interests and perspectives. This confluence has led to the idea of a third culture (Kagan, 2009), that of social scientists, who are located in an intermediate point between naturalists and humanists in nine main dimensions: primary interests; primary sources of evidence and control over the conditions that generate them; the essential vocabulary that they use; the influence of historical conditions on the interpretation of results; the importance of ethics; the dependence on material support to achieve their ends; the conditions in which their research is carried out; the contribution of their discoveries to the economy; and the criteria of beauty that they use to classify their conclusions, results, models, and theories.

The science of psychology always lives in the tension produced by the purpose of objectivity (seeking general laws that explain human behavior, through observation and with predominantly quantitative methodologies) and two very important aspects related to its object of study.

The first is that the study of psychology is not possible without considering subjectivity, due to the propositional character of psychological behavior (Yela, 1996b). In terms of philosophical materialism, it is not possible to eliminate the subject in the operations that are carried out within the scientific field, in the same way that it is eliminated in physics. Here, in the psychological field, the importance of subjectivity is always present, and its presence is an important component in the explanation of the result. This is the case to the extent that psychology can be defined as the science of the subject and behavior (Pérez-Álvarez, 2018).

Article in press

The second aspect, which should not be ignored, is that it is not possible to disassociate the human sciences, including psychology, from natural language, since what is denoted by this natural language is the object of its explanation. In the words of Ribes-Iñesta (2018) (p. 61) «...psychological phenomena occur in and as ordinary language. Ordinary language is constitutive, as a social practice between individuals, of psychological phenomena...Psychological phenomena are the relationships that take place in the practices of ordinary language, and which include as an indissoluble part of them what we consider «psychological» words and expressions: imagining, thinking, perceiving, feeling, and other psychological phenomena. The psychological phenomenon *is* what happens when such terms in expressions are part of relationships with others and with diverse objects and events in circumstance». To the extent that the explanation moves away from this natural language, the idea to be explained loses its psychological nature and becomes of another type (explaining the execution of a propositional behavior as simple creation of neural networks, for example). But natural language is imprecise, of blurred logic, unfitting for a natural science.

There is not one single scientific approach to psychology, but several, despite the fact that there is growing unity in institutional psychology. Psychology's progress has been more instrumental and methodological than conceptual. In physiological psychology, there are more and better methods to study the nervous or endocrine activity; progress is being made in the development of new and old assessment methods; the mathematical techniques that give support to the theoretical models are being refined. Despite these advances, the conceptual distance between the two psychologies is not becoming narrower, nor is the reductionist takeover bid of one over the other materializing. The different solutions that have been offered (reductionism-materialism-monism, reductionism-idealism-monism, emergentism, interactionism, epiphenomenalism, parallelism, etc.) do not incite general agreement, and none of the results of these solutions has served to incite a single model or paradigm.

THE DEMARCATION CRITERION IN THE FIELD OF PSYCHOTHERAPY

It should be noted briefly that, when we talk in this section about the demarcation criterion in psychotherapy we are leaving aside its possible valuation as an activity or development outside the framework of science, whatever the science may be. The considerations of psychotherapy as a philosophical or artistic exercise, which explicitly place it outside the umbrella of scientific knowledge, are outside the scope of analysis of this article. Here we are only interested in determining when a practice, which claims to be scientific and obtains the benefits associated with that consideration, can be legitimately claimed as such.

Psychotherapy is a relational activity, which, like psychology, focuses on the person as a whole. Thus, what

psychology as a science preaches also has an impact on psychotherapy as a scientific activity. The establishment of a demarcation criterion for psychotherapeutic activities must inevitably carry forward the duality of psychology and recognize that the naturalistic pretension that animates some criteria is completely inappropriate and out of reality.

This naturalistic pretension underlies initiatives such as the movements of EST (empirically supported treatment), EBT (evidence based treatments), and EBP (evidence based practice) (Dianne L Chambless & Hollon, 1998; Dianne L. Chambless & Ollendick, 2001). The main problem, expressed in the terms of Norcross and Wampold (2019), is that these initiatives are based on a biomedical model for psychotherapy, which focuses almost exclusively on treatment methods for particular disorders, ignoring the results of research on more important factors such as the therapeutic relationship or adaptation of treatment to the preferences and culture of the patient. Referring to the particular case of post-traumatic stress disorder, these well-known researchers criticize the APA (American Psychological Association) for having adopted a clinical guide that recommends some treatments over others, based on the results of RCTs that have not considered the common factors. The result is that «The Guideline, literally and figuratively, depicts disembodied therapists applying manualized interventions to discrete ICD/DSM disorders. Focusing on what hardly impacts psychotherapy outcome (selection of particular treatment methods) and practically ignoring what strongly determines psychotherapy outcome (relationship, responsiveness) constitutes fatal flaws, in our opinion.» (Norcross & Wampold, 2019) (p. 392). It is clear that, with regard to what has been said for the particular case of psychotherapy applied to post-traumatic stress, the same can be said for the other psychological disorders and problems to which it is directed.

Follette (2018) expresses himself in the same terms when he states that the methodology used to evaluate treatments necessarily leads to the fact that it is not possible to distinguish pseudoscientific interventions from scientific ones because a biomedical model is being used that does not have a field of vision of psychological science. Thus, the empirical evaluation of effectiveness, as the only criterion, leaving aside the rational assessment of the soundness of the theories that support the therapy, may lead to it being «conceivable that a voodoo-based technique could be classified as probably effective according to the current evaluative structures in psychotherapy» (David, Jay Lynn, & Montgomery, 2018).

However, this should not mean that we should stop looking for the best psychotherapeutic technique available. Treatments continue to be applied in the field of mental health, including psychotherapeutic ones, which are not supported by any rational assessment of their effects. In this respect, the figures are striking (David et al., 2018). For example, in the field of depression, only one in six people in high-income countries, and one in twenty-seven in low- and middle-income countries,

Article in press

obtain effective treatment based on minimum quality standards (Thornicroft, 2017; Thornicroft et al., 2017). Some of these unscientific treatments are psychotherapies without empirical support, which can be harmful because they discourage, hinder, or prevent people who need effective treatment from obtaining it, so their psychological, social, occupational, economic, and other problems not only do not improve, but get worse (Trent Codd III, 2018). Others may deteriorate 3 to 10%, or even 15%, of patients, making their situation worse than it was at the beginning of therapy (Lilienfeld, 2007). The problem, therefore, should not be, in an ethical profession such as psychology, whether this situation can be tolerated, but whether there is any way that we can manage to establish rules to protect patients (or clients).

There is no completed set of rules that allow us to discriminate, precisely and reliably, what is science from pseudoscience (McIntyre, 2020). As we have seen, this is an impossible goal if we claim the existence of a single science (natural science), or if we seek simple criteria, such as judging the scientific nature of a psychotherapy solely according to its empirical efficacy in one context, usually highly restrictive and therefore often a mere mockery of reality. If we want to develop a demarcation criterion, we will have to handle complex decision elements, linked to the scientific field of psychology, that allow us to discriminate between the psychotherapeutic practices that have scientific support over those that do not, all this while expressly renouncing the reaching of universal consensus. Although seeing what is occurring in other disciplines, with less complex scientific objects, as happens with the flat-earthers and the anti-vaxxers, the maximum aspiration should be that the institutions of psychology, whether professional or scientific, successfully establish a common language that allows them to separate the wheat from the chaff.

I do not have the answer. With extreme caution, it can be suggested in the light of what has been discussed so far, that a set of rules aspiring to become a demarcation criterion in a scientific field such as psychology, on the back of the natural and human sciences, should contain, as a minimum, the following premises or conditions:

1. Assessment models must adopt a complex perspective, taking into account all the elements of the scientific field, which define psychological science. Among them, one of the most important is that they take into account the solidity of the theoretical assumptions underlying the techniques under analysis. This solidity must inevitably be measured not only against other elements of psychological theory, but also with the objective knowledge that other scientific disciplines have generated in their respective fields. Science is not solipsistic, but that does not mean that each scientific field cannot have its own elements.
2. It should be transversal to the prevailing models in psychology, recognizing the methodological and conceptual plurality of psychological science. Analysis models should be

mixed, qualitative and quantitative, taking into account not only quantifiable phenomena but also qualitative characteristics relevant to psychological assessment.

3. It must recognize and faithfully distinguish proposals that are scientific from those that are not, in accordance with what is «recognized» in science and the profession. This criterion of Laudan (1983) is essential at the present time, when a multiplicity of psychotherapies, with different and distant foundations, seem to achieve equally positive results in the RCTs. Faced with this reality, there are two positions that must be maintained. The first is that we cannot remain impassive in the face of denial, admitting that all options are acceptable simply because they have internal acolytes or enthusiastic clients. After all, there are also astrologers and astrology clients, but this does not validate the discipline for psychological counseling. The second is that the verdict of the Dodo bird, which really affects a number of therapies, which have carried out systematic studies, should incite us to question an assessment methodology that is producing contradictory results.
4. It must be sufficient and necessary to grant or deny scientific status to the proposals evaluated, which is yet to be done, and it is not clear what this would look like.

At present, we are not in a position to submit a proposal that meets these conditions. However, we do seem to be in a position to begin to formulate one. To do so, it is essential to maintain a scientific attitude, an inclination to draw on the current reality and to change our ideas about it according to the empirical evidence (McIntyre, 2020). This would be no small thing, judging by our history.

ACKNOWLEDGMENT

Although the author is solely responsible for what has been said here, I would like to express my gratitude to Professor Marino Pérez Álvarez both for his teaching and for his comments and suggestions that have improved this manuscript.

CONFLICT OF INTEREST

There is no conflict of interest.

REFERENCES

Bertolín Guillén, J. M. (2020). Psicoterapias en la psicología clínica y psiquiatría actuales en España [Psychotherapies in current clinical psychology and psychiatry in Spain]. *Revista de Psiquiatría y Salud Mental (Barc.)*. doi: <https://doi.org/10.1016/j.rpsm.2020.01.004>

Blumenthal, A. L. (1975). A reappraisal of Wilhelm Wundt. *American Psychologist*, 30(11), 1081-1088. doi: 10.1037/0003-066X.30.11.1081

Blumenthal, A. L. (1998). Leipzig, Wilhelm Wundt, and psychology's gilded age. In G. A. Kimble & M. Wertheimer (Eds.), *Portraits of pioneers in psychology* (Vol. 3). Washington DC: American Psychological Association.

Article in press

- Brock, A. C. (2006). Rediscovering the history of psychology: Interview with Kurt Danziger. *History of Psychology*, 9(1), 1-16. doi: 10.1037/1093-4510.9.1.1
- Bueno, G. (1995). *¿Qué es la ciencia? La respuesta de la teoría del cierre categorial [What is science? The response of the categorical closure theory]*. Oviedo: Pentalfa.
- Bunge, M. (2000). *La investigación científica [Scientific research]*. México: Siglo XXI editores, s.a. de c.v.
- Bunge, M. (2011). Knowledge: Genuine and Bogus. *Science and Education*, 20(5-6), 411-438. doi: 10.1007/s11191-009-9225-3
- Chambless, D. L., & Hollon, S. D. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology*, 66(1), 7.
- Chambless, D. L., & Ollendick, T. H. (2001). Empirically Supported Psychological Interventions: Controversies and Evidence. *Annual review of psychology*, 52(1), 685-716. doi: 10.1146/annurev.psych.52.1.685
- Consejo General de Colegios Oficiales de Psicólogos [The Spanish Psychological Association]. (2019a). El Consejo General de la Psicología apoya el Plan de protección de la salud frente a las pseudoterapias [The Spanish Psychological Association supports the Health Protection Plan Against Pseudotherapies]. *Infocop Online*. Retrieved from http://www.infocop.es/view_article.asp?id=7889
- Consejo General de Colegios Oficiales de Psicólogos [The Spanish Psychological Association]. (2019b). El Consejo General de la Psicología hace aportaciones al Plan de Protección de la Salud frente a las Pseudoterapias [The Spanish Psychological Association contributes to the Health Protection Plan Against Pseudotherapies]. *Infocop Online*. Retrieved from http://www.infocop.es/view_article.asp?id=7866
- David, D., Jay Lynn, S., & Montgomery, G. H. (2018). An Introduction to the Science and Practice of Evidence-Based Psychotherapy. In D. David, S. Jay Lynn, & G. H. Montgomery (Eds.), *Evidence-Based Psychotherapy. The State of the Science and Practice* (pp. 1-10). Hoboken, NJ, USA: John Wiley & Sons, Inc.
- Follette, W. C. (2018). Pseudoscience Persists Until Clinical Science Raises the Bar. *The Behavior Therapist*, 41(1), 24-31.
- Freire, E. S. (2006). Randomized controlled clinical trial in psychotherapy research: An epistemological controversy. *Journal of Humanistic Psychology*, 46(3), 323-335.
- Fuentes, J. B. (2019). El Aprendizaje como contexto determinante de la Psicología científica: metodología biológica versus metodología psicológica [Learning as a determining context for scientific psychology: Biological methodology versus psychological methodology]. *Revista de Historia de la Psicología*, 40(2), 27-41. doi: 10.5093/rhp2019a7
- Gelo, O. C. G., Lagetto, G., Dinoi, C., Belfiore, E., Lombi, E., Blasi, S., . . . Ciavolino, E. (2020). Which Methodological Practice(s) for Psychotherapy Science? A Systematic Review and a Proposal. *Integrative Psychological and Behavioral Science*, 54(1), 215-248. doi: 10.1007/s12124-019-09494-3
- Hergenhahn, B. R., & Henley, T. B. (2013). Physiology and Psychophysics. In B. R. Hergenhahn & T. B. Henley (Eds.), *An Introduction to the History of Psychology. Seventh Edition*. Belmont, CA (USA): Wadsworth Cengage Learning.
- James, W. (1892-2001). *Psychology. The Briefer Course*. New York: Dover Publications, Inc.
- Kagan, J. (2009). *The Three Cultures. Natural Sciences, Social Sciences, and the Humanities in the 21st Century*. Cambridge: Cambridge University Press.
- Kimble, G. A. (1984). Psychology's two cultures. *American Psychologist*, 39(8), 833-839. doi: 10.1037/0003-066X.39.8.833
- Kuhn, T. S. (1962-2004). *La estructura de las revoluciones científicas [The Structure of Scientific Revolutions]*. Argentina: Fondo de Cultura Económica.
- Laudan, L. (1983). The Demise of the Demarcation Problem. In R. S. Cohen & L. Laudan (Eds.), *Physics, Philosophy and Psychoanalysis: Essays in Honour of Adolf Grünbaum* (pp. 111-127). Dordrecht: Springer Netherlands.
- Lilienfeld, S. O. (2007). Psychological Treatments That Cause Harm. *Perspectives on Psychological Science*, 2(1), 53-70. doi: 10.1111/j.1745-6916.2007.00029.x
- Lilienfeld, S. O., Lynn, S. J., & Bowden, S. C. (2018). Why Evidence-Based Practice Isn't Enough: A Call for Science-Based Practice. *The Behavior Therapist*, 41(1), 42-47.
- Lilienfeld, S. O., McKay, D., & Hollon, S. D. (2018). Why randomised controlled trials of psychological treatments are still essential. *The Lancet Psychiatry*, 5(7), 536-538. doi: 10.1016/S2215-0366(18)30045-2
- Machado, P. P., & Beutler, L. E. (2017). Research Methods and Randomized Clinical Trials in Psychotherapy. In A. J. Consoli, L. E. Beutler, & B. Bongar (Eds.), *Comprehensive Textbook of Psychotherapy. Theory and Practice*. New York: Oxford University Press.
- McIntyre, L. (2020). *La actitud científica. Una defensa de la ciencia frente a la negación, el fraude y la pseudociencia [The scientific attitude. A defense of science against denial, fraud, and pseudoscience]*: Cátedra.
- Meehl, P. E. (1954). *Clinical versus statistical prediction: A theoretical analysis and a review of the evidence*. Paper presented at the Proceedings of the 1955 Invitational Conference on Testing Problems, Minneapolis.
- Nickles, T. (2006). Problem of Demarcation. In S. Sarkar & J. Pfeifer (Eds.), *The Philosophy of Science. An Encyclopedia* (pp. 188-197). New York: Routledge. Taylor & Francis Group.
- Norcross, J. C., & Wampold, B. E. (2019). Relationships and responsiveness in the psychological treatment of trauma: The tragedy of the APA Clinical Practice Guideline. *Psychotherapy*, 56(3), 391-399. doi: 10.1037/psf0000228

Article in press

- Pérez-Álvarez, M. (2018). Psychology as a Science of Subject and Comportment, beyond the Mind and Behavior. *Integrative Psychological and Behavioral Science*, 52(1), 25-51. doi: 10.1007/s12124-017-9408-4
- Pigliucci, M. (2013). The Demarcation Problem. In M. Pigliucci & M. Boudry (Eds.), *Philosophy of Pseudoscience. Reconsidering the Demarcation Problem*. Chicago: The University Chicago Press.
- Pinker, S. (2018). *En defensa de la Ilustración. Por la razón, la ciencia, el humanismo y el progreso [In defense of the Enlightenment. For reason, science, humanism, and progress]*. Barcelona: Paidós.
- Popper, K. (1935-2002). *The logic of Scientific Discovery*. London: Routledge Classics.
- Ribes-Iñesta, E. (2018). *Un estudio científico de la conducta individual. Una introducción a la teoría de la Psicología [A scientific study of individual behavior. An introduction to the theory of Psychology]*. Ciudad de México: Manual Moderno.
- Snow, C. P. (1959-2012). *The two cultures. 15th Edition*. Cambridge: Cambridge University Press.
- Sturm, T. (2006). Is there a problem with mathematical psychology in the eighteenth century? A fresh look at Kant's old argument. *Journal of the History of the Behavioral Sciences*, 42(4), 353-377. doi: 10.1002/jhbs.20191
- Tackett, J. L., Brandes, C. M., King, K. M., & Markon, K. E. (2018). Psychology's replication crisis and clinical psychological science. *Annual Review of Clinical Psychology*, 15.
- Teo, T. (2005). The natural-scientific critique. In T. Teo (Ed.), *The Critique of Psychology. From Kant to Postcolonial Theory* (pp. 77-92). USA: Springer Science+Business Media, Inc.
- Thornicroft, G. (2017). Improving access to psychological therapies in England. *The Lancet*, 391(10121), 636-637. doi: [https://doi.org/10.1016/S0140-6736\(17\)32158-X](https://doi.org/10.1016/S0140-6736(17)32158-X)
- Thornicroft, G., Chatterji, S., Evans-Lacko, S., Gruber, M., Sampson, N., Aguilar-Gaxiola, S., . . . Kessler, R. C. (2017). Undertreatment of people with major depressive disorder in 21 countries. *Br J Psychiatry*, 210(2), 119-124. doi: 10.1192/bjp.bp.116.188078
- Trent Codd III, R. (2018). Pseudoscience in Mental Health Treatment: What Remedies are Available? *The Behavior Therapist*, 41(1), 1-3.
- Varga, S. (2015). *Naturalism, interpretation and mental disorder*. Oxford: Oxford University Press.
- Wampold, B. E., & Imel, Z. E. (2015). *The Great Psychotherapy Debate. The evidence for what makes psychotherapy work*. New York: Routledge.
- Wikipedia. (2020). Opinion. Retrieved from https://en.wikipedia.org/wiki/Opinion#cite_note-Wynne-3
- Yela, M. (1996a). El problema del método científico en Psicología [The problem of the scientific method in psychology]. *Psicothema*, 6(Supl.), 353-361.
- Yela, M. (1996b). La estructura de la conducta, estímulo, situación y conciencia [The structure of behavior, stimulus, situation, and consciousness]. *Psicothema*, 8(Supl), 89-147.