A REASSESSMENT OF PRAGMATISM IN BEHAVIOR ANALYSIS: I. THE THEORY OF TRUTH

UNA REEVALUACIÓN DEL PRAGMATISMO EN EL ANÁLISIS DE LA CONDUCTA: I. LA TEORÍA DE LA VERDAD

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Abstract

Radical behaviorism is often said to be inspired by pragmatism. Similarities between these two philosophies generally center on epistemological issues. For instance, the pragmatic theory of truth as effectiveness would be shared by behavior analysts. But because pragmatism is a philosophy built precisely by the gathering of components derived from previously existing philosophical traditions, it cannot be reduced to just one of these components alone without running the risk of mischaracterization. Is the idea of truth as effectiveness the only common ground

between pragmatism and behavior analysis? In this review, divided in two parts, we argue for a negative answer, exploring on one hand, different dimensions of the pragmatic theory of truth, and on the other hand, world views underlying these two philosophies. In this first part, we note that the criterion of effectiveness is not the sole pragmatic criterion of truth. The criterion of coherence, along with the role of beliefs addressed in pragmatic theory, are fundamental to a thorough understanding of pragmatic theory of truth, with relevant consequences to evaluate the relations between pragmatism and behavior analysis.

Key words: pragmatism, behavior analysis, truth, coherence, beliefs

Resumen

A menudo se dice que el conductismo radical se inspira en el pragmatismo. Las semejanzas entre estas dos filosofías generalmente se concentran en aspectos epistemológicos. Por ejemplo, la teoría pragmática de la verdad como efectividad, o sea, funcionamiento exitoso, es compartida por los analistas de la conducta. Pero, como el pragmatismo es una filosofía construida precisamente mediante la conjunción de componentes derivados de tradiciones filosóficas previamente existentes, no puede ser reducido a un sólo aspecto sin correr el peligro de representarlo de forma inadecuada. ¿La idea de la verdad como efectividad es el único terreno común entre el pragmatismo y el análisis de la conducta? En este trabajo, dividido en dos partes, argumentamos una respuesta negativa, explorando, por un lado, diferentes dimensiones de la teoría pragmática de la verdad, y, por otro lado, las visiones de mundo subyacentes a estas dos filosofías. En esta primera parte, se observa que el criterio de eficacia no es el único criterio pragmático de la verdad. El criterio de coherencia, junto con el papel de las creencias tratado en la teoría pragmática, son fundamentales para una comprensión completa de la teoría pragmática de la verdad, y tiene consecuencias relevantes para evaluar su relación con el análisis de la conducta.

Palabras clave: pragmatismo, análisis de la conducta, verdad, coherencia, creencias

In line with Skinner's (1974) statement that radical behaviorism is the philosophy of behavior analysis, many authors have analyzed different features of this philosophy (Chiesa, 1994; Moore, 2008; Zuriff, 1980). The relevance of these analyses is justified inasmuch as it recognizes this philosophy as a discourse critically reflecting the production of scientific knowledge, and addressing assertions about subject matter, method, and research objectives of science. However, different understandings of radical behaviorist philosophy coexist. Within this diversity of interpretations,

mechanistic (Delprato, 1993; Marr, 1993; Shull & Lawrence, 1993), contextualistic (Hayes, Hayes, & Reese, 1988; Morris, 1988), positivistic (Abib, 1982, 1985; Zuriff, 1980) and pragmatic elements (Baum, 1994; Leigland, 1999; Moxley, 2001; Zuriff, 1980) of behavior analysis have been identified.

According to the pragmatic interpretation, repercussions of pragmatism are identifiable in several aspects of behavior analysis and radical behaviorist philosophy. Discussions of the objectives of science (Baum, 1994; Krägeloh, 2006; Lattal & Laipple, 2003), world views (Laurenti; 2008; Moxley, 2001, 2007), philosophy of language (Abib, 2001; Moxley, 2002), ethics (Lopes, Laurenti, & Abib, 2012; Rocha, 2013; Ruiz & Roche, 2007) and politics (Newman, 1991; Rakos, 1980) are a few examples. With regard to this first aspect, behavior analysis is said to be linked to pragmatism because both hold that the objectives of science are prediction and control, and both measure the effectiveness of a theory according to the achievement of these objectives. As Krägeloh (2006) wrote, "pragmatism considers any theory as true if it is effective in prediction and control of behavior" (p. 326).

This discussion reflects one of the uses of the term pragmatism, understood as a method to overcome metaphysical disputes (cf. James, 1907, p. 45). Due to this meaning, one of the arguments traditionally used to link radical behaviorist philosophy to pragmatism concerns the adoption, in both philosophical systems, of an instrumental criterion of truth: effectiveness (Abib, 2001, 2009; Baum, 1994; Hayes, Hayes, & Reese, 1988; Lattal & Laipple, 2003; Leigland, 1999; Morris, 1993a, 1993b; Moxley, 2001; Tourinho & Neno, 2003; Zuriff, 1980). However, judging effectiveness as the sole criterion of truth implies neglecting other important dimensions of a pragmatic theory of truth.

Thus, considering that when it comes to a pragmatic perspective of the theory of truth employed by behavior analysis, the effectiveness criterion is the one that stands out. The objective of this first essay is to further explore this criterion in the context of two other aspects of pragmatism: the *coherence* criterion and the *role of beliefs*. The latter two having been largely overlooked in behavior-analytic discussions on the topic. Moreover, we limit ourselves to highlighting two main representatives of pragmatism and radical behaviorism, William James and B. F. Skinner, respectively.

The instrumental criterion of truth as effectiveness

The instrumental criterion of truth can be evinced in pragmatism when it is considered as a method from which one can adopt a belief or an idea by outlining

its practical consequences. In James' own words (1907), "the pragmatic method . . . is to try to interpret each notion by tracing its respective practical consequences. What difference would it practically make to any one if this notion rather than that notion were true?" (p. 45). Under this perspective, beliefs, ideas and principles that encompass practical consequences are validated, and those that do not produce such consequences are deemed false. But what are practical consequences? Generally speaking, practical consequences are those that make a significant difference in life (Abib, 2009; cf. James, 1907, p. 76). As stated by James (1907):

> *True ideas are those that we can assimilate, validate, corroborate and verify. False ideas are those that we can not.* That is the practical difference it makes to us to have true ideas; that, therefore, is the meaning of truth, for it is all that truth is known-as. (p. 201)

This discussion relates to the pragmatic theory of truth, which on the surface would identify truth with effectiveness. It is an instrumental criterion because according to this conception of truth a belief works as an instrument of action that aids the organization of one's individual experience. Again, according to James (1907):

> the possession of true thoughts means everywhere the possession of invaluable instruments of action; and that out duty to gain truth, so far from being a Black command from out of the blue, or a 'stunt' self-imposed by our intellect, can account for itself by excellent practical reasons. (p. 202)

Declaring truth as effectiveness, pragmatism places true beliefs as "*one species of good*" (James, 1907, p. 75) since having true ideas became something useful for us in solving practical problems of life, as well as the belief in false ideas, consequently, shall not be of any use. As stated by James, "*the true is the name of whatever proves itself to be good in the way of belief, and good, too, for definite, assignable reasons*" (p. 76).

This instrumental criterion also applies to science, for scientific knowledge works as an instrument of action inasmuch as it helps scientists to work satisfactorily with their research object. In that sense, James (1907) attested that "no theory is absolutely a transcription of reality, but … any one of them may from some point of view be useful" (p. 57) and that "*theories thus become instruments, not answers to enigmas, in which we can rest*" (p. 53). Furthermore, from a philosophy of language point of view, identifying true beliefs with effectiveness means considering that a formulation can be truthful if it guides actions having practical consequences. In that sense, metaphysical, religious, and scientific formulations all can be considered truthful if they produce these consequences. Indeed, pragmatism adopts

a more democratic conception of truth as it may be attributed to any statement whose acceptance produces practical consequences. Consequently, the adjective 'truthful' is not restricted to logic and empirical verification according to the molds established by scientific method. True statements are not, therefore, a privilege of science. James (1907) summarized this pragmatic position by saying "but you see already how democratic she [pragmatism] is. Her manners are as various and flexible, her resources as rich and endless, and her conclusions as friendly as those mother nature" (p. 81).

The instrumental concept of pragmatic truth contrasts with a traditional view that conceives truth as a property inherent to facts (Abib, 2009; James, 1907; Lattal & Laipple, 2003). As James (1907) expressed it, an idea or belief on its own cannot be truthful, but it becomes truthful in its own process of validation. In other words, once the truth of ideas and beliefs is evaluated by its practical consequences – and such consequences are identified in the course of experience – pragmatism holds a conception of provisory truth, since experience is constantly changing. About this, James asserted: "truth is *made*, just as health, wealth and strength are made, in the course of experience" (p. 218). Furthermore, in the Jamesian conception, "the practical value of true ideas is thus primarily derived from the practical importance of their objects to us" (James, 1907, p. 203). Then, because the requirements change along with the individual's experience with the world, the practical value of one's beliefs also is changing constantly.

Coherence as another pragmatic criterion of truth

Nevertheless, the validation process of a new belief is not limited to verification between particular beliefs and their practical effects only. According to James, a belief is deemed valid "*unless the belief incidentally clashes with some other vital benefit*" (James, 1907, p. 77). That is, the instrumental criterion is subordinated to the criterion of coherence of truth, which involves relations between new beliefs and a set of beliefs validated beforehand (Tourinho & Neno, 2003). That way, even though effectiveness is necessary for validation of an idea, it is not a sufficient and independent measure. The process initially implies verifying whether the new idea is coherent with the stock of beliefs that has formerly organized individual experience productively (Tourinho & Neno, 2003).

According to James (1907), therefore, the process of adoption of a theory, for example, is complex because considering the criterion of coherence, the theory

must agree with a set of beliefs of the individual that was previously determined as truth. To clarify this, James referred to Schiller and Dewey to describe the process of establishing new truthful ideas; these ideas may be scientific, philosophical, or from common sense. The process is the same. In this procedure, the individual facing a new experience may have his/her stock of old beliefs and opinion jolted. This new experience can put in check the set of old beliefs, or it can simply show that they are no longer capable of satisfying new urges. The result of that, wrote James, "is an inward trouble to which his mind till then had been a stranger, and from which he seeks to escape by modifying his previous mass of opinions" (pp. 59-60).

Notwithstanding, the change of the old stock of opinions to accommodate the new experience is not a passive and cold process, imposed by the intellect. There is resistance to change: "the greatest enemy of any one of our truths may be the rest of our truths. Truths have once for all this desperate instinct of self-preservation and of desire to extinguish whatever contradicts them" (James, 1907, p. 78). While opinions are shifting, a new idea may arise and enable assimilating the new experience to the old stock of opinions, with a minimum possibility of disruption. This new idea facilitates the fluid transit between new and old opinions, and it is considered, then, truthful; "new truth is always a go-between, a smoother-over of transitions" (James, 1907, p. 61). It is in this sense, thus, that James (1907) declared that statements taken as true in science, or in any other domain, mean "*that ideas … become true just in so far as they help us to get into satisfactory relation with other parts of our experience*" (p. 58).

Worth mentioning at this point is that the process of making an idea become truthful is very conservative, inasmuch as "an *outrée* explanation, violating all our preconceptions, would never pass for a true account of a novelty" (James, 1907, p. 60). James (1907) complemented this by stating that "the most violent revolutions in an individual's beliefs leave most of his old order standing" (p. 60). Such conservative character explains the difficulty and complexity that involves the validation process of a new idea, since, concerning the criterion of coherence, conciliation between old and new beliefs is required. This same process, for its part, applies to old ideas in storage, which also have mediated even older ideas and new experiences in their time, in this sense "they also once were plastic" (p. 64). Once more, these ideas were considered truthful, because they modified the old stock of opinions in a way that it made possible to admit novelty without completely undermining the set of beliefs previously validated.

The description of the genesis of new truthful ideas expands the discussion about the pragmatic theory of truth. In the validation process, before an idea is confronted with practical consequences to evaluate its effectiveness, it necessarily has passed through a process of conciliation of a new experience with the old stock of opinions. James (1907) highlighted the fact that neglecting the role of old opinions consolidated as truths in the process of establishing new truthful ideas ". . . is the source of much of the unjust criticism leveled against pragmatism. Their influence is absolutely controlling. Loyalty to them is the first principle – in most cases it is the only principle" (p. 61). Considering how complementary the relation between the coherence and effectiveness criteria is, "to 'work' means both these things" (James, 1907, p. 217), namely, being coherent and effective. These are, therefore, the meaning of truth.

The discussion about the formation of truthful ideas also needs to be expanded to consider subjective and objective elements that take part in this process. James (1907) recognized that it is hard "to discriminate subjective from objective factors in Truth's development" (p. 66). The validation process of a new idea is objective in the sense that it corresponds to objects or realities —"by 'realities' or 'objects' here, we mean either things of common sense, sensibly present, or else common-sense relations, such as dates, places, distances, kinds, activities" (James 1907, p. 206). That is, this reality, just as well as objects, concerns concrete experiences and practical consequences. On the other hand, the process of making an idea become truthful is subjective, because satisfaction and desire of individuals take part in it. James (1907) elucidated this aspect by saying that "a new opinion counts as 'true' just in proportion as it gratifies the individual's desire to assimilate the novel in his experience to his beliefs in stock. … When old truth grows, then, by new truth's addition, it is for subjective reasons" (p. 63).

Moreover, James (1896/1912) stressed that the process of pursuit and validation of a true idea cannot be explained in purely intellectual terms. In his own words: "Evidently, then, our non-intellectual nature does influence our convictions. … and pure insight and logic, whatever they might do ideally, are not the only things that really do produce our creeds" (p. 11). Still according to him, volitional and passionate elements can exert significant control in the process of adopting a new belief. By volitional and passionate, James referred to factors such as "fear and hope, prejudice and passion, imitation and partisanship, the circumpressure of our caste and set" (p. 9). So in order to understand the dimensions that permeate the pragmatic criteria of truth, we move on to discuss the role of belief —commonly neglected in

the linking of radical behaviorism and pragmatism —especially its volitional and passionate elements considered critical to explain this matter.

The role of belief in the pragmatic theory of truth

As for the criterion of effectiveness, there is a clear connection between belief and action. As seen before, in the core of his theory of truth, James (1907) assumed that the adoption of different sets of beliefs leads to practical differences. That is because, metaphorically, James compared a belief with a live hypothesis, which is translated as a tendency of the individual to act in a certain way. On the other hand, facing a dead hypothesis, there is no disposition or inclination to act (James, 1896/1912). Thereby, it is supposed that there is an intrinsic relation between belief and action, which is to say that "The maximum of liveness in a hypothesis means willingness to act irrevocably. Practically, that means belief; but there is some believing tendency wherever there is willingness to act at all" (James, 1896/1912, p. 3). In other words, James acknowledged there is always a belief underlying a specific action, which, if truthful, leads to practical consequences.

Given this definition of belief, James added that beliefs cannot always be justified on purely intellectual criteria. This has to do with human nature itself, which necessarily involves a passionate component (cf. James, 1896/1912, p. 19). Recognizing this passionate nature does not, however, mean being subdued by it. In fact, James recommended that, in certain contexts, we should fight our passions, seeking to justify our beliefs on intellectual grounds and refusing to believe anything without sufficient evidence (cf. James, 1896/1912, p. 8; p. 14). Science would be an emblematic case. Rooted on the science's view of his time, whose epitome was Newtonian physics, James understood that science could achieve the right balance between believing something and its justification in intellectual bases. According to James (1896/1912), such balance is due to a "regular *technique*" called the "method of verification" (p. 21). Thus, the scientific method is understood as a strategy that allows scientists to mitigate their passionate nature in the belief justification process (cf. p. 7).

Going beyond the scientific field, James (1896/1912) discussed some circumstances where we would have the right to believe, that is, to act in accordance with hypotheses that do not have sufficient scientific evidence to justify them – so there would be a more prominent participation of passionate elements in this process. These circumstances provide a "*genuine* option" between two hypotheses. In this

kind of option, the hypotheses are necessarily alive, i.e., involving strong action trends. It is also a "*forced* option" because it is based on a complete logical disjunction, in which there is no possibility of not choosing; and a "*momentous* option" because it involves a unique opportunity, whose loss is not insignificant or reversible (cf. James, 1896/1912, pp. 2-4). Examples of these types of options are the moral, religious and those referring to interpersonal relationships issues, since they involve questions whose solution cannot wait for conclusive logical and empirical evidence. In such cases, "*Our passional nature not only lawfully may, but must, decide an option between propositions, whenever it is a genuine option that cannot by its nature be decided on intellectual grounds*" (p. 11).

However, even in science, it is not always possible to completely nullify this passionate component (James, 1896/1912, p. 20). In addition, there are situations in which totally annihilating this aspect would be counterproductive: "For purposes of discovery such indifference is to be less highly recommended, and science would be far less advanced than she is if the passionate desires of individuals to get their own faiths confirmed had been kept out of the game" (James, 1896/1912, p. 21). With that in mind, James (1896/1912) argued that not all decisions are, even in a scientific context, exclusively founded on purely intellectual elements and some of our actions may be driven, to a certain extent, by this volitional and passionate aspects.

Extrapolating the Jamesian ideas to the science, it can be assumed that the belief system of a scientist is composed not only of beliefs that are justified empirically and logically, as there may be a degree of "irrationality" within those beliefs. These irrational elements become evident when the topic is the coherence criterion in pragmatic theory of truth, because the fierce defense of scientists to maintain their own stock of oldest beliefs can reveal a passionate component of belief in the process of validation of a new theory. James (1896/1912) offered this observation:

> Why do so few 'scientists' even look at the evidence for telepathy, so-called? Because they think, as a leading biologist, now dead, once said to me, that even if such a thing were true, scientists ought to band together to keep it suppressed and concealed. It would undo the uniformity of Nature and all sorts of other things without which scientists cannot carry on their pursuits. (p. 10)

In short, it is possible to assert that the role of belief is a defining feature in this theory of truth. Beliefs prove to be indispensable for understanding the instrumental criterion of truth because evaluating the effectiveness of a belief in terms of its practical consequences is to assume in advance that different beliefs involve particular actions. Citing Peirce, James (1907) stated that ". . . our beliefs are really rules

for action" (p. 46). Besides that, assuming that some of our actions or beliefs are, in greater or lesser degree, also influenced by passionate and volitional elements, which surpass purely intellectual arguments, explains how the applying of the coherence criterion also can be taken by irrational elements (James, 1896/1912). Therefore, it is argued that all aspects, effectiveness, coherence and the role of beliefs, are central for the pragmatic theory of truth.

Relations between the pragmatic theory of truth and Skinnerian science

Considering the features of the pragmatic theory of truth discussed so far, what would be the implications of assuming a relation between pragmatism and the Skinnerian framework? Affinities with pragmatism are noted in Skinner's proposal for explaining behavior in terms of its consequences (Skinner, 1981). Like James (1907), Skinner (1974) adopted an instrumental truth criterion: "a proposition is 'true' to the extent that with its help the listener responds effectively to the situation it describes" (p. 235). Transposing this discussion to the scientific field, in radical behaviorism, scientific knowledge is the verbal behavior of scientists: "[science] is a corpus of rules for effective action, and there is a special sense in which it could be 'true' if it yields the most effective action possible" (Skinner, 1974, p. 235). Truthful knowledge and effective rules are those confirmed by experience, inasmuch as they lead the scientist to the achievement of his/her scientific objectives.

This instrumental criterion of truth may be used, then, to evaluate explanations of behavioral phenomena (Tourinho & Neno, 2003). Skinner (1953) seems to have suggested prediction and control as practical consequences of a science of behavior:

Science not only describes, it *predicts* [emphasis added]. It deals not only with the past but with the future. Nor is prediction the last word: to the extent that relevant conditions can be altered, or otherwise *controlled* [emphasis added], the future can be *controlled* [emphasis added]. (p. 6)

In fact, the explanations that aid scientists in dealing productively with the research object, in this case predicting and controlling behavior, are deemed valid (Tourinho & Neno, 2003). Nevertheless, we have observed that there is a certain insufficiency in the adoption of effectiveness as the only criterion of truth. This instrumental criterion should be subordinated to an evaluation of the relation between new explanations and those previously validated. In this way, from a Jamesian

pragmatic point of view, effectiveness, understood as prediction and control, is not sufficient to validate the explanation in radical behaviorism.

Extrapolating the discussion of the relation between Skinnerian system and pragmatism in addition to the instrumental criterion of truth, Tourinho and Neno (2003) asserted that subordinating the criterion of effectiveness to that of coherence ". . . means that new explanations for behavior should be consistent with basic tenets of the behavior-analytic explanatory system" (p. 69). That is, if we consider the coherence criterion in Skinner's theory and apply it in the process of validating new explanations of behavior, this process would involve assessing the agreement between these new beliefs about such object and that stock of basic principles of behavior already considered valid. It is possible to state, therefore, that by inferring the basic behavior principles needed to discuss the coherence criterion, Tourinho and Neno suggested that these principles can assume in Skinner's theory the same role as belief has in the theory of truth of James[1].

This discussion raises some difficulties because, as suggested by Tourinho and Neno (2003), basic tenets of the behavior-analytic explanatory system, which would serve as the basis for applying the coherence criterion, are not yet well defined and, in fact, are the subject of major debates in the context of behavior analysis. For example, discussions about monism versus pluralism (Laurenti, 2009; Lopes, 2009b), and determinism versus indeterminism (Laurenti, 2008; Strapasson & Dittrich, 2011), which imply different beliefs about behavior. Despite this, Tourinho and Neno argue that two principles identified in Skinner's system count on the reasonable agreement of behavior analysts, namely, the relational character of behavior and the recognition of variability as intrinsic to behavioral relations. But, at least with respect to this latter aspect, it is also far from the target of a consensus[2]. As Skinner (1989) noted, we assume that the existence of variation "is in the nature of behavior" (p. 129), an assumption consistent with the Skinnerian explanatory

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[1]   It is worth remarking that James' concept of belief, understood as a disposition to act, does not seem to subscribe to mentalism or cognitivism. As James (1896/1912) put it: "belief is measured by action" (p. 29). Actually, this seems consistent with Skinner's definition of belief: "Belief is a matter of probability of action . . ." (Skinner, 1969, p. 170).

[2]   For example, variability has been treated as: (a) the result of a lack of experimental control (Sidman, 1960), (b) a resulting of management of contingencies (e.g., operant and respondent variability) (Neuringer, 2014; Neuringer, Kornell, & Olufs, 2001); and, as we believe, (c) a natural aspect of behavior (Skinner, 1989).

mode called selection by consequences. A more detailed discussion of the issue is beyond the scope of this essay. For now, however, we mentioned this controversy to illustrate how the beliefs about behavior demand delimitations, and to argue that the consolidation of them is essential to initiate the validation process of new explanations of behavioral phenomena, as well as for assessing the coherence of new basic principles, which could characterize these objects of study.

If we take the identification between belief and basic principles of behavior further, we must keep in mind that James' pragmatism assigns a peculiar role to belief: that of making the process of validation even more complex. James (1907) admitted that subjective elements, alongside objective ones, participate in the new-beliefs validation process. Moreover, James also recognized, at the core of his conception, some irrational elements (volitive and passionate), which many times influence decisions (James, 1896/1912; Lopes, Laurenti, & Abib, 2012).

When discussing the genesis of truthful ideas, James (1907) emphasized that subjective elements are related to an individual's satisfaction and desire. In a way, Skinner (1974) admitted that "knowledge", including the scientific knowledge, "is subjective in the trivial sense of being the behavior of a subject" (p. 143); and that "a truth of a statement of fact is limited by sources of the behavior of the speaker" (p. 136). On the other hand, James (1907) argued there are also objective elements involved in the validation process of new beliefs; so this process does not imply subjectivism, especially in the case of the science (cf. James, 1896/1912, p. 7). Similarly, Skinner (1974) did not reduce scientific knowledge to knowledge of an individual scientist. Scientific knowledge is objective in the sense that it is knowledge of the world, and not what the scientist feels or introspectively observes. When the scientist "analyses the world around him, and if, as a result, he states facts or laws which make it possible for others to respond effectively without personal exposure to that world, then he produces something in which he himself is no longer involved" (Skinner, 1974, pp. 144-145). Although the truth of a statement is conditioned to the speaker's behavior sources, it is not limited to those sources, but also involves "the control exerted by the current setting, the effects of similar setting in the past, the effects upon the listener leading to precision or to exaggeration or falsification and so on" (Skinner, 1974, p. 136).

Indeed, both Skinner and James seem to accept the participation of subjective and objective elements in the truthful beliefs validation process. However, would there also be parallels between pragmatism and radical behaviorism concerning the role of volitional and passionate elements in the justification of our beliefs? In other

words, in the context of behavior analysis would it be possible to assume, as in the pragmatic proposition, a volitional and passionate element in the framework of basic beliefs of the behavioral phenomenon? Or would behavior analysis subscribe to an intellectualist concept of truth, by which scientific principles would be justified based upon purely rational foundations? If the latter is the case, these principles would never amount to beliefs in the conception of James, of which volitional and passionate elements can partake to a lesser or greater extent (Lopes, Laurenti, & Abib, 2012).

On the other hand, when we think about James' examples demonstrating the influence of this "irrational" nature in our convictions, we question whether the heated debates about certain principles discussed in behavior analysis, such as determinism versus indeterminism or mechanism versus contextualism, for example, would be under the control of the volitional and passionate aspect of belief. These are principles that still cannot be determined in terms of conclusive logical and empirical evidence. Consequently, the assured advocacy of some scientists for their basic principles of behavior could be the expression of this volitional and passionate dimension that, according to James' pragmatism, is inherent to the scope of beliefs (Lopes, Laurenti, & Abib, 2012). Therefore, if behavior analysts are to sustain relations with the pragmatic theory of truth, accepting the beliefs of the Jamesian proposition, and assuming them as basic principles of behavior, the role of this degree of irrationality in the scope of scientist's behavior needs to be discussed.

The acknowledgment of this degree of irrationality can bring promising implications within the study of behavior, especially in the scientific scope because it means broadening the discussion of science as the behavior of scientists by inserting the role of motivational variables in the multiple controls of scientists' verbal behavior. According to Moore (1996), pragmatism assumes that, since a scientific concept is a verbal phenomenon, knowing the principles controlling this type of phenomenon is crucial to the comprehension of the construction process of these terms and to understanding their own effectiveness. In Moore's words: "that is a matter of identifying the stimulus control involved (a) in the origin of the term, as an instance of verbal behavior, and (b) in the application of the term among the scientists for whom it facilitates effective action in the world at large" (p. 98). Returning to the Jamesian point of view, belief is a disposition to act, and volitional and passionate elements may influence this disposition. Thus, if the verbal operant may be described in terms of probability of emitting certain verbal responses (cf. Skinner, 1957, p. 22), the discussion of the role of belief in the pragmatic theory of truth makes us consider motivational variables in verbal behavior of scientists. In

this case, the verbal operant in which are present more evidently the motivational variables is the mand. According to Skinner (1957), the mand is independent of a specific relation with a previous stimulus, and is predominantly controlled by specific emotional and motivational conditions; namely, the mand is "under the functional control of relevant conditions of deprivation or aversive stimulation" (p. 36). Contrasting to the mand is the tact, which is a verbal response controlled by preceding events or proprieties without being significantly influenced by specific emotional and motivational conditions (Skinner, 1957).

Different from a view of science based on the idea of neutrality, which asserts that scientific knowledge is product of a purely rational activity, devoid of motivations, emotions and interests, the pragmatic theory of truth proposes that scientific beliefs are not always founded uniquely in empirical evidence. Applying this discussion to behavior analysis, scientists' verbal behavior is not necessarily comprised only of tacts (cf. Lopes, 2009a). There may be mixed control of verbal behavior, in which to a lesser or greater extent motivational variables may participate. Skinner (1957) himself declared that "verbal behavior is probably never completely independent of the condition of a particular speaker" (p. 147). Based on that observation by Skinner, if the conditions of an individual speaker always influence his/her verbal behavior, the tact (in its pure, objective meaning) hardly ever occurs. The approximation between pragmatism and behavior analysis, based on the pragmatic theory of truth, contributes to a more critical and less dogmatic view of scientific knowledge. From this perspective, objectivity of scientific knowledge would be defined by the pursuit and explicitness of the control of scientists' verbal behavior, which implies asking how much preceding situations and emotional or motivational states participate in the occurrence of certain verbal responses.

Final remarks

We have suggested that the Jamesian pragmatic theory of truth, generally mentioned to substantiate connections with Skinnerian science, cannot be restricted to the criterion of effectiveness. It also is necessary to consider the criterion of coherence, which demands that new principles agree with those previously validated (James, 1907; Tourinho & Neno, 2003). Furthermore, it also is necessary to include the role of beliefs in the pragmatic theory of truth, suggesting that in the field of beliefs there is a volitional and passionate element that participates in the

adoption of some beliefs over others. Indeed, pragmatism articulates rationality, volition and affectivity in the explanation of the process of forming truthful ideas.

The thesis based on Skinner's proposal that science is the behavior of the scientists, may gain in scope with these connections to pragmatism, expanding the discussion about the control of scientists' verbal behavior to motivational variables. This suggests that behavior analysis and radical behaviorism could benefit from further discussions of the processes of production of scientific knowledge. A thorough view on the relations between the pragmatic theory of truth and the Skinnerian theory may lead behavior analysts to a more complex and objective conception of scientific knowledge – since it would explain different controlling variables of scientific behavior – more critical – by abandoning the concept of absolute truth – and humbler – because scientific knowledge would not have the prerogative over truth. It would facilitate frank dialogues with different fields of knowledge. These would be practical consequences possibly relevant for the survival of behavior analysis as a cultural practice.

Expanding the discussion about coherence and beliefs that make practical changes in our lives, pragmatism does not seem to be limited to an epistemological domain as a theory of truth, but also seems to involve discourse on world views. Therefore, exploring other sides of pragmatism may shed light on the affinities of radical behaviorism with other world views. Would it be coherent, from a pragmatic perspective, to adopt the pragmatic theory of truth and at the same time reject its ideas about role of beliefs – including, then, beliefs on the nature of the world? Would it be pragmatic to support relations with pragmatism as a method only, denying its world view? We will analyze these issues in Part II of this article, which follows, and in which we discuss the relation between the pragmatic world view and the world views of behavior analysis.

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