



THINKING PSYCHOLOGY BEYOND THE MIND AND THE BRAIN: A TRANS-THEORETICAL APPROACH

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A pesar de su boyante expansión, la psicología sigue boyante también en el sentido de flotante sin un referente claro de ciencia de qué. La fragmentación sigue siendo el paisaje más llamativo de la psicología. Su concepción más socorrida como ciencia de la mente y la conducta aboca a más problemas que resuelve, entre ellos el dualismo que se creía superar. Por su parte, la neurociencia cognitiva, lejos de suponer una salida, parece ella misma una fábrica de explicaciones dualistas con su personificación del cerebro atribuyéndole las funciones psicológicas. Como alternativa, se presentan cinco concepciones no dualistas ni cerebrocéntricas de la psicología actual, como muestra de que el dualismo y el cerebrocentrismo no son inevitables. Frente a la pluralidad de enfoques, se propone una concepción transteórica de la psicología como ciencia del sujeto y el comportamiento, más allá de la mente y el cerebro.

Palabras clave: Ciencia psicológica, Comportamiento, Dualismo, Cerebro-centrismo.

Despite its buoyant expansion, psychology is still also buoyant in the sense that it is floating without a clear definition regarding the science of what it is exactly. The landscape of psychology remains strikingly fragmented. Its most cherished conception as a science of mind and behavior leads to more problems than it solves, among them the dualism that it was thought to overcome. On the other hand, cognitive neuroscience, far from being a solution, seems itself to be a factory of dualistic explanations with its personification of the brain attributing the psychological functions to it. As an alternative, we present five conceptions of current psychology that are neither dualistic nor brain-centric, as proof that dualism and brain-centrism are not inevitable. Faced with the plurality of approaches, a trans-theoretical conception of psychology is proposed as the science of the subject and behavior, beyond the mind and the brain.

Key words: Psychological science, Comportment, Dualism, Brain-centrism.

B UOYANT PSYCHOLOGY

Psychology is buoyant in the sense that it is prosperous and plethoric. Since the end of the 19th century when it was constituted as an autonomous discipline, it has not stopped growing and expanding. In current figures, it would be enough to consider the more than fifty psychology faculties in Spain today with 70,000 students and the number of colleges in the order of 80,000. However, psychology is also buoyant in the sense of floating without going deep, adrift. The assessment Ortega made on his psychology course of 1915-1916 about nineteenth-century psychology can be applied to that of the twentieth century and that of the twenty-first century to date. As Ortega says, "During the last century the psychology ship was chartered with all provisions: exquisite precision apparatuses, laboratories, associations, surveys, journals, nothing was

spared. Only one thing was thought about very little: the destiny of the ship." (Ortega y Gasset, 1981, p. 27).

It seems that all winds favor psychology, like that ship that went to explore the west pole, without asking what is a terrestrial pole. Thus, psychology has steered towards the study of consciousness with the structuralism of the early twentieth century but it has also docked in the study of the unconscious with psychoanalysis. It has centered on behavior with behaviorism but then has turned towards cognition with cognitivism. Now it is trying to cast anchor at the brain with cognitive neuroscience. The present winds of mindfulness seem to be blowing fresh air into consciousness, the mind and the brain with the Dalai Lama as a guru of mental well-being and neuroscience. Who knows if big data and algorithms will end up being constituted as the new object of psychology.

Psychology can also be buoyant and should be in a third sense: in the bullfighting sense of tackling its own drifting with frankness and nobility, beyond self-satisfied prosperity. It would be worth digressing from self-satisfied psychology to progress to places that are not normally traveled, if not avoided or passed through on tiptoe. We refer to fundamental problems of psychology of the type that do not stop you from sleeping but that we must also not fall asleep to.

One problem begins when we ask what psychology is. It is an uncomfortable question for any psychologist. If each of the

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Developed from the lecture "Nuevos enfoques para pensar la psicología más allá de la mente y el cerebro" ["New approaches to thinking psychology beyond the mind and the brain"] presented at the III Congreso Nacional de Psicología [III National Congress of Psychology] held in Oviedo from 3-7 July 2017



attendees at a conference had to give an answer, undoubtedly different and even distant conceptions would arise. In any case, although it is not unanimous, of course, there is a definition that could be called standard and almost official supported by the American Psychological Association, as well as in widely used academic texts, according to which psychology is the “study of the behavior of individuals and their cognitive processes” or of the mind and behavior (American Psychological Association, 2018; Gerrig, 2014; Schacter, Gilbert, Wegner, & Nock, 2015).

However, this conception of psychology opens several problems in turn (Pérez-Álvarez, 2018a; 2018b). They refer to the assumption of psychology as a natural science on account of the scientific method, as if there were a method whose application would grant the status of natural science. There is no science without method, but the scientific method does not exist as something in itself either. In fact, the scientific method of standard psychology is the positivist method, typically hypothetical-deductive, quantitative, encrypted in replication and adhered to the criterion of truth as correspondence between theory and reality. Strictly speaking, it is not a method in the sense of a repertoire of steps to follow, but a certain philosophy of science (none other than the logical positivism of the early twentieth century) that establishes a whole style of thought and procedure. As a philosophy of science, it is not the only one nor probably the most appropriate one in psychology. For now, the methodology (supposedly now a reflection on the method) could also be inductive and abductive, qualitative, without renouncing replication but without considering it the *sine qua non* condition of scientificity in favor of, for example, the identification of phenomena (Iso-Ahola, 2017), based on other criteria of truth such as coherence, pragmatism, and narrative reconstruction (Asay, 2018; Hayes, Hayes, Reese, & Sarbin, 1993).

The identification of psychology as a science on account of the scientific method is probably the basis of its current *crisis of scientificity* in relation precisely to the problem of the replication of psychological findings in the order of only 40% (Ferguson, 2015; Open Science Collaboration, 2015). The problem of replication contrasts with the high confirmation of hypotheses in psychological research, in the order of 93%, only comparable with psychiatry (Fanelli, 2010). If it were based on hypothesis confirmation, psychology and psychiatry would be at the top of the sciences above physics, chemistry, and molecular biology (Fanelli, 2010). The crisis of scientificity also has to do with the toothbrush problem, in which each author has his own theory and does not want to use that of others (Mischel, 2009). Adherence to one’s own theories perhaps contributes more to the accumulation of self-referential publications than to the cumulative progress of knowledge, also contributing to the progressive fragmentation of psychology into an archipelago of species that create their habitat or scientific niche. The image of the archipelago of the Galapagos Islands is appealing, where Darwin observed how there were adaptive variations on the nearby islands, such as the famous beaks of the finches. Psychological theories also “sharpen” their beaks to extract

hypotheses and data that end up constituting their way and means of life.

Particularly, the conception of psychology as a science of mind and behavior incurs in the usual dualism no matter how much it is coated with current concepts and metaphors starting with processing, computing, storage, executive function, and “latent variable” (Pérez-Álvarez, 2018a; 2018b). On the other hand, cognitive neuroscience also reverts to dualism with the assignment to the brain of the psychological functions (Mudrik & Maoz, 2014). In fact, cognitive neuroscience is today the largest shelter of dualism with its mind-brain stitchings and personifications of the brain itself. Dualism is not an error due to mere philosophical reasons, but because it is at the base of the indicated problems, which are not only academic issues. The biggest problem of dualism is practical, insofar as it leads us to look in the inappropriate place to understand psychological phenomena and, if necessary, change them and decontextualize them, reducing them to processing and computing as a thing of the mind and the brain.

In the first part of this article, we present five non-dualistic and non-brain-centered conceptions of current psychology with the aim of showing that neither dualism nor brain-centrism are inevitable. In the second part, a transtheoretical conception of psychology as a science of the subject and behavior is offered with a view to showing in this case the ontological entity of psychology beyond the plurality of approaches.

NON-DUALISTIC AND NON-BRAIN-CENTERED CONCEPTIONS OF PSYCHOLOGY

We propose here a variety of conceptions of psychology that do not incur in the indicated problems of psychology. Whilst not new, these conceptions are nevertheless fresh air in the current panorama of psychology. It is not a question of offering a systematic recount but only representative of these conceptions that are innovative and at the same time rooted in the psychological tradition. One could include the *constructivist perspective* in the tradition of Baldwin, Vygotsky, and Piaget (Sánchez & Loredo, 2007; 2009), the *activity theory* of the renewed Russian-Danish tradition with its emphasis precisely on activity as the primary contact with the world (Mammen & Mironenko, 2015), as well as the new paradigm of *relational evolutionary science*, contextually holistic, integrating evolutionary and developmental explanations (Overton & Lerner, 2014; Witherington & Lickliter, 2016).

Within the conceptions included, we start with the *new science of the mind* (4E) followed by *contextual behavioral science* (CBS) as each one overcomes its own limitations as hegemonic psychologies throughout the twentieth century. Next, we present *ecological psychology* focused on perception, not as a process of inputting information but as a capture of the already organized world with its offerings and availability. In the same vein, *cultural psychology* is a radical consideration of the human psyche rooted in social practices. While ecological psychology offers an alternative to computational representational psychology, cultural psychology offers the alternative to the



inner/outer dichotomy, the mark of the everlasting dualism. Finally, a renewed *existential psychology* places psychology to face life itself with its undying problems.

New science of the mind 4E

The new science of the mind 4E refers to the consideration of mental processes as *embodied* rather than cerebral, *embedded* in the world beyond the head, *enacted* on environmental structures instead of on mental representations and *extended* in the environment not located within the self (Fuchs, 2018; Rowlands, 2010; Stewart, Gapenne, & Di Paolo, 2010; Thompson, 2007). Within their differences, these concepts have in common an anti-Cartesian position. In one way or another, they consist of reclaiming the mind as something interior, separate from the body and the world and re- interpreting it as an activity within the world. Both the body and the world are constituent parts of the mind, not mere supports or extensions on which the mind acts. The mind is not understood as something in itself that inhabits a place, but as the very relationship that is constituted and interwoven between the body and the world. The world is no longer offered as information to be processed, but as an *opening* that is configured and reconfigured every time in the thread of our proprioceptions, sensorimotor movements, actions, and experiences.

The new science of the mind takes phenomenology as its philosophical patronage with particular reference to Heidegger and Merleau-Ponty (Fuchs, 2018; Rowlands, 2010; Stewart et al, 2010; Thompson, 2007). Ortega can also be added, echoing concepts such as I-circumstance, I-executive and the structure of the world of life.

The touchstone of the new science of the mind begins with the idea of sensorimotor perception involving the whole body. The things of the world are offered to us with their forms and structures by virtue of the perspectives and movements of the body. Although only an orange circular-convex surface is shown to us, we actually see an orange-there, whose other out-of-sight aspects are co-present, forming the orange we see. What we are not given are bits of information that are filtered, processed and then projected in the “dark room” of the mind or of the brain as a representation of the orange, according to ridiculous explanations that still exist. The action is implied in the perception or perhaps rather perception implies action starting with bodily movements and changes of perspective, not to mention manipulative operations with things (Fuchs, 2018; Thompson, 2007). The perception-action implies tacit knowledge of the world (know-how) often not even articulated in the language when not *ineffable*. This “dark matter of the mind” emerges from acting as we learn the conventions (Everett, 2016).

Compared with the first generation of cognitivism and its conception of the mind as information processing (representational mind), the new science of the mind offers a holistic, dynamic and ecological-social approach to the mind based on a corporeal subject, located, active, coextensive with the world, *in media res* of things, people and artifacts (Rowlands, 2010). The new science of the mind is “new” and

may seem strange due to its non-Cartesian conception, the standard conception being Cartesian: the default mind. However, the new conception should by now be obvious and on the contrary the Cartesian strange, starting with the processing of information as a misleading metaphor.

Contextual behavioral science

Contextual behavioral science (CBS) is an extension of Skinner’s radical behaviorism. It is defined as a strategy of scientific and practical development, based on contextual philosophical assumptions (Hayes, Barnes-Holmes, & Wilson, 2012). Its “emancipation” of behaviorism began to be notorious in the early 1990s with the aforementioned book *Varieties of scientific contextualism* (Hayes et al, 1993) and culminated in 2004 with the declaration of a whole “new wave” of behavioral therapy (Hayes, 2004). In 2016 the great book of CBS was published (Zettle, Hayes, Barnes-Holmes, & Biglan, 2016).

The new CBS has its brand in relational frame theory (RFT), a behavioral theory of cognition and language developed based on Skinner’s work on verbal behavior (Hayes, Barnes-Holmes; & Roche, 2001). RFT shows how the consistent human ability to learn relationships between events and new functions, is built and not trained. Stimuli, situations and events, including private events (feelings, thoughts), can acquire new functions or alter existing ones by being part of a relational framework. Thus, the experience of “sadness”, because it is part of frames of reference or verbal contexts such as for example “it is bad”, “I cannot stand it”, “I have to remove it”, ends up acquiring “negative”, aversive and avoidant functions, different from the mere experience of “being sad”. In another historical context and relational framework, sadness could be an experience of joy or happiness as it seems to be in the case of Michelangelo in the Renaissance (“My joy is melancholy”) and Victor Hugo in Romanticism (“Melancholy is the pleasure of being sad”).

RFT is at the base of a variety of educational, organizational, ecological, and cultural fields of application (Zettle et al, 2016), with the clinical field being the best known. As well as its practical relevance, the research program of RFT silences the typical and topical criticisms of “behaviorism” due to it supposedly not being able to account for new behaviors that were not trained directly. Far from this, RFT gives an experimental account of the emergence of untrained behaviors and functions. It is the cultural institutions themselves, the environmental regulations and the relational frameworks instituted in educational practices that make language seem instinctive to the Chomskians.

The contextual philosophy of CBS is based on the contextualism of Stephen Pepper in *A World of hypotheses* (Pepper, 1942/1970), as well as on radical behaviorism and American pragmatism (Hayes et al, 2012). Contextualism differs from other conceptions of science such as mechanism, organicism and formalism in that it takes the event or act-in-context as the unit of analysis (Pepper, 1942/1970, p.233). As Hayes et al say, “A functional contextual perspective focuses on the behavior of organisms interacting in and with a context,



considered both historically and situationally: the ongoing situated act-in-context. Units drawn from this focus are holistic—the act and its context are not fully separable.” (Hayes et al, 2012, p.3). Contextual philosophy takes functional analysis from behaviorism with particular emphasis on the analysis of verbal behavior. For its part, it takes from pragmatism its practical, empirical-useful sense, as a criterion of truth. Functional contextualism aims at prediction and influence. Prediction-and-influence is the distinctive aspect of functional contextualism, in relation to other varieties of scientific contextualism whose emphasis is description or understanding (Hayes et al, 1993).

CBS conceives itself as a natural science nested in the science of evolution (Hayes et al, 2012; Hayes, Sanford, & Chin, 2017). Its self-conception as a natural science is a characteristic hallmark of the behaviorist tradition. Even though Skinner offers selection by consequences as a unification of evolutionary, ontogenetic and cultural levels, this is not biological reduction. In fact, radical behaviorism is characterized by the explanatory autonomy of behavioral analysis with respect to biology (Zilio, 2016). The relocation of CBS in the orbit of the science of evolution is more strategic due to the prestige of natural science, than ontological based on the nature of things (Hayes et al, 2017). In ontological questions, Hayes et al (2012) declare themselves to be *a*-ontological or agnostic, as if the evolutionary naturalistic decanting no longer implied an implicit, unthinking, dogmatic ontology and thus a certain ontology. In this case, an evolutionary naturalist ontology that in the end is incoherent with functional contextualism itself and the explanatory autonomy of behavior according to radical behaviorism (Zilio, 2016).

The lack of ontological criteria of CBS, together with its pragmatism, have surely contributed to its strange pairing with cognitive therapy for which it had been registered as a “new wave” (Hayes, 2004). This pairing seems to be due more than anything to the distribution of the clinical training market according to the standards of the Association for Behavioral and Cognitive Therapies (ABCT, Hayes & Hofmann, 2018).

Ecological Psychology

Ecological psychology refers here to the ecological psychology of James Gibson (Gibson, 1979), in the tradition of phenomenology and Gestalt with antecedents in the radical empiricism of William James and the field theory of Kurt Lewin (Heft, 2012). Its approach supports the theory of direct perception versus the conception of information processing. Gibson questions how visual perception can be an internal reconstruction based on two-dimensional inputs of a three-dimensional environment, according to the theory of processing. The theory of processing, says Gibson, leads to a chasm between the mind where perception is supposed to take place and the world where light interacts with the retina. In its place, Gibson maintains that perception is a direct, non-inferential and non-computational process, in which “information” is already organized by virtue of the active exploration of organisms and the “informational” properties of the environment.

In this respect, Gibson introduces the famous notion of *affordance*. Affordance is a word half invented by Gibson to refer to the psychological properties of the environment consisting of opportunities, offers, invitations, and availability for appropriate behavior in relation to them. Chairs, tables, staircases and other things in the everyday world are already offered for certain behaviors that they themselves invite and facilitate, without the need for any computation, which Gibson would call “mental gymnastics”. Affordances are properties of the environment correlative to the abilities of organisms. As Gibson says, an “An affordance is neither an objective property nor a subjective property; or it is both if you like. An affordance cuts across the dichotomy of subjective-objective and helps us to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychological, yet neither. An affordance points both ways, to the environment and the observer.” (Gibson, 1979, p. 129).

With the cognitivist turn at the second half of the 20th century, Gibson’s theory was marginalized from the mainstream of psychology. However, the theory of direct perception did not cease to be a research program (Turvey, Shaw, & Mace, 1981), of growing interest today extended to cultural forms (Heras-Escribano & de Pinedo-García, 2017; Kaaronen, 2017; Ramstead, Veissière, & Kirmayer, 2016; Rietveld & Kiverstein, 2014). According to the Gibsonian approach, behavior and cognition are part of the dynamic system of the relationship between the organism and the environment it inhabits. It would not make sense then to reduce the cognitive system to the brain (or even the body), since cognition and behavior emerge from the “dynamic brain-body-world nexus” (Kaaronen, 2017, p.5).

The notion of affordance is related to the niche notions of *evodevo* theory, the behavioral setting of Roger Baker’s *eco-behavioral science* and Vygotsky’s *scaffolding*. The cultural scaffolding and the availability of the environment (affordance) are complementary concepts of a non-representational approach (Estany & Martínez, 2014; Ramstead et al, 2016). The notion of affordance (along with scaffolding) offers us another way to enter psychology. Instead of the usual entrance, beginning with perception as a first process of a series of processes (boxes, modules), the Gibsonian perception consists of actions and operations of the organism correlated to the “objects” of the environment. Recall the famous experiment by Held and Heine, how the active cat develops the depth pattern, unlike the passive one that is transported in the gondola, although the stimulation is the same for both (Held & Heine, 1963). See Figure 1. If it were a matter of processing, the cat transported “like a gentleman” in the gondola could do so much better than the “worker”. As Pinillos concludes from this experiment, *action constitutes an essential ingredient of complete perceptual activity* (Pinillos, 1975, p.198).

Bad psychology begins when perception is taken as a process of inputting information. The world is not offered as information to be processed, but as a “landscape of affordances” (Ramstead et al, 2016; Rietveld & Kiverstein, 2014). A better task than “mental gymnastics” would be for psychologists to describe and



fix the world, instead of placing everything in the mind. For aspects of the world to become relevant, it is required that they “solicit” our attention. The theory of affordances could help to overcome the attitude-action hiatus by providing behavioral environments that promote certain social practices (Kaaronen, 2017; Rietveld & Kiverstein, 2014), as well as the nature-culture dichotomies (Heras-Escribano & de Pinedo-García, 2017), mind/brain and mind-world (Chemero, 2009).

Cultural psychology

Cultural psychology is not reduced to the obviousness of emphasizing the importance of cultural factors in psychology. Its central thesis is that psychological phenomena are inherently historical-cultural. From their origin in development, they are mediated by social practices through language and other cultural artifacts. Cultural psychology is not equivalent to transcultural or environmental psychology. While the latter presuppose a basic, general and universal (typically Western) mind that culture and environment modulate, cultural psychology emphasizes a process of mutually constitutive, inter-subjective development through social “tools”.

Cultural psychology is not really new, but a renewed version of an egregious tradition that goes back to the “psychology of the peoples” of Wilhem Wundt and more closely to Lev Vygotsky. From Vygotsky it is important to remember the concepts of interiorization, zone of proximal development and the aforementioned scaffolding. Cultural psychology is conceived as a hybrid discipline at the intersection of developmental psychology and social psychology with anthropology, history, sociology, sociolinguistics and education sciences as its closest neighbors (Valsiner, 2014a).

Its roadmap includes proposals to correct two limitations of standard psychology. The first invites the study of the psyche in objective cultural contexts beginning with what are known as the higher processes (in the Vygotskian tradition), instead of by decontextualized basic processes. The *Yokohama Manifesto* has been presented as a starting point to restore the role of higher psychological functions as the central object of psychology (Valsiner, Marsico, Chaudhary, Sato, & Dazzani, 2016, preface). The second proposal points to the methodology in a “new key” (Valsiner, 2014b). It does not refer merely to the rehabilitation of qualitative methods, but to a methodology that captures the dynamic microgenetic process when it occurs, not just after it has occurred. Interviews, observations, narratives, biographical memories, and analysis of cultural patterns are methods used in the study of higher processes beginning with the imagination throughout development, a starring theme in cultural psychology (Zittoun et al, 2013). Imagination, a subjective process if ever there was one, is at the same time deeply social as it is rooted in collective media, artifacts and imaginaries, functioning as an interface or interactive loop of daily contact with the world (Zittoun & Gillespie, 2016).

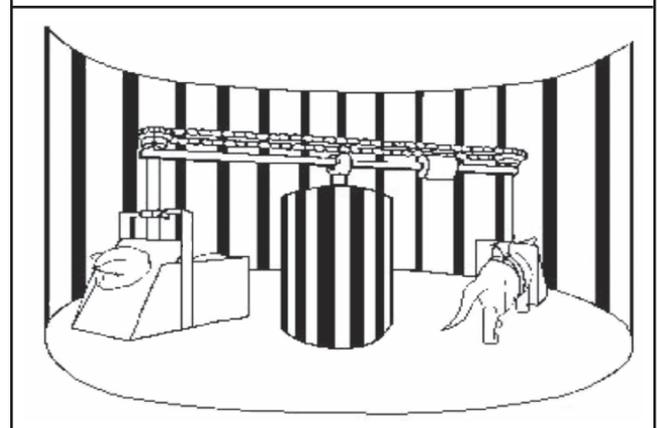
Cultural psychology assumes the “unique” character of psychological events located in an irreversible flow of time, on the edge of the past and the future: the present. This is a

challenge for an idiographic science, whose study of unique events is still nonetheless objective. Scientific objectivity derives from the identification of functional patterns and principles that organize the similarity between the events that constitute patterns. Although they are all *local* phenomena (ephemeral and irreversible), they are still real by means of *general* cultural processes. Culture is conceived here as a process of semiotic mediation, as a tool for the flexibility of the psyche in relation to the continuous variability of contexts. The objective culture (collective and pre-existing), becomes subjective culture, given the unique position of each one.

How does something external and objective become subjective and internal? The point is that the convenient inner/outer metaphor does not result in the unnecessary ontological notion of an interior as opposed to the exterior. Post Vygotskian developments try to overcome this misunderstanding arising from Vygotsky’s own conception of internalizing. From the elaborations of the notion of internalization-externalization as a mutual cyclical process, the concepts of position exchange and symbolic artifacts have been introduced (Zittoun & Gillespie, 2015). Position exchange refers to the different positions (roles), each with its configuration of demands, constraints, affordances, expectations and experiences, that constitute one’s life. It is understood then that the different positions give rise to a continuous stratification of experiences. On the other hand, symbolic resources refer to semiotic artifacts (books, movies, songs) that help guide the experience and, even more so, to produce it. Semiotic artifacts constitute a type of scaffolding that operates in the zone of proximal development promoting potential development. As they are experiences guided from outside, the experiences are also internal psychological phenomena. This is the question and the problem.

What has been internalized? The notion of internalization suggests that something external has happened inside that then comes out. However, internalization is not putting “inside” what

FIGURE 1
APPARATUS FOR THE EQUALIZATION OF MOVEMENT AND
VISUAL EXPOSURE OF AN ACTIVE CAT PULLING THE GONDOLA
AND A PASSIVE ONE THAT IS CARRIED



was “outside.” To begin with, the semiotic guide operates on the border of the individual and the world. Secondly, it is the guide to a flow of irreversible experiences through semiotic tools and artifacts. In both cases, there is a situation and a cultural artifact that provides scaffolding and guidance of one’s experience.

In both cases, strictly speaking, there is nothing that becomes internalized, rather, there is an external world that produces an experience. The experience is called ‘internal’ merely because it is not accessible to observers, it has private qualia that cannot be captured from an observer’s perspective. Thus, we would argue that there is no necessary problem with the internal/external metaphor provided we do not apply the metaphor in a simplistic manner. (Zittoun & Gillespie, 2015, p.485).

Beyond internalization-externalization, it is about seeing the complex stratification of experiences and responses caused by diverse situations and cultural guides, often contradictory. What you have is a *changed organism*, according to Skinner’s expression, in line with the experiences of life. The idea is that the mind or psyche, as cultural psychology tends to say, is neither inside nor outside, but between the individual and the world, in their way of acting and interacting.

Existential Psychology

Existential psychology is characterized by putting in the foreground certain conditions and concerns of life and the way of dealing with them. The conditions refer to the open, contingent and paradoxical nature of the human being. Open, like being-in-the-world, out-there, in accordance with the etymology of “existing” as “going out” and “being-out,” more or less exposed or safe. Contingent, which being a certain way could be another way without certainty of how it will be in the future. Paradoxical because of the polarity of constriction/expansion, between security and freedom as the main human dilemma (Schneider, 1999).

The concerns refer to the meaning of life (emptiness, meaning), loneliness (communication, relationships), freedom (decisions, responsibility), always over a background of uncertainty and death as the only certainty. Life not seeming to have another sense as certain as death, death is what gives meaning to life with its finiteness, threat, vulnerability, uncertainty and need to cope. Even though the “language of suffering” is usually clinical, psychological problems are still basically existential, beginning with anxiety and depression. Existential psychology is not to be confused with humanistic psychology. The existential approach embraces the Sartrean motto according to which “existence precedes essence”. Also relevant is Simone de Beauvoir’s motto referring to women, reused here in general to say now that we are not born a human being but we become one. Existential psychology today has two facets: experimental and cultural.

Experimental existential psychology studies the impact in our daily lives of existential concerns such as those indicated, according to an experimental paradigm known as *mortality salience* within terror management theory (Greenberg, Koole, & Pyszczynski, 2004; Hayes, Schimel, Arndt, & Faucher, 2010).

The idea is to make the implicit awareness of our own mortality (or other condition) salient and to seek possible psychological defenses. A variety of defenses have been found that in principle do not have an obvious relationship with mortality such as adherence to political parties, worldviews, religion, science, or fame. For example, mortality salience strengthens the belief in intelligent design in those who believe in God, whereas in those who are convinced by natural science it strengthens the acceptance of the theory of evolution (Stavrova, Ehlebracht, & Fetchenhauer, 2016).

On the other hand, uncertainty salience also produces defenses similar to death salience referring to worldview, belonging, and attachment as well as other more specific ones such as fairness (van den Bos, 2009). Uncertainty more than death seems to be the cornerstone of our existential condition with its two facets, expansion (openness, adventure, freedom) and constriction (retreat, security, fear-of-freedom). Uncertainty has been presented as the fear of all fears including death (Carleton, 2016).

Cultural existential psychology studies how culture organizes existential experiences and the defenses against them (Sullivan, 2016). More specifically, it studies how different cultural patterns protect from some types of suffering and lead to other types, and it concludes that there do not seem to be cultures that reduce the challenges of life to zero. Thus, individuals in a collectivist culture (as opposed to an individualist one) are more prone to guilt and shame than to anxiety. The collectivist culture then protects from anxiety and leads to guilt and shame due to the greater commitment and responsibility towards others. On the other hand, individuals from an individualistic culture (with respect to a collectivist one) are more prone to anxiety than to guilt and shame. The individualistic culture then protects from guilt and shame and leads to anxiety, due to the greater commitment and enthusiasm for the self (Sullivan, 2016).

Table 1 provides a selection of fundamental concepts for each of the concepts cited.

TRANSTHEORETICAL CONCEPTION OF PSYCHOLOGY AS A SCIENCE OF THE SUBJECT AND BEHAVIOR

Recent conceptions of psychology have been revised with a view to showing alternatives to dualism and brain-centrism. The persistence of dualism in psychology and its drift towards brain-centrism are, as understood here, problematic conceptions. Although there is no psychology that identifies itself as dualistic or brain-centric (these are critical identifications), it refers to any conception of psychological functioning that has as reference any type of mental process, module, mechanism, executive function, processing system, computation or representation in some way. These are “impersonal,” mechanistic explanations, below the level of the subject or person, which attribute to some kind of homunculus or phantom in the machine that which is actually done by the subject situated in the world.

The mind- and brain-centered conceptions of psychology cause debate regarding the standard scientific conception that assumes psychology to be a natural science (the mind and the



brain as universal natural organs), on account of the hypothetical-deductive method of generating hypothesis and constructs, such that conceptions and methods feed back into each other. The scientific production generated does not necessarily mean an advance in the science of psychology. Instead of methodological psychology, a radical, total psychology is required, centered on the root where the psychological phenomena lie, like the psychologies presented, whose plurality should not surprise or disappoint.

Within their differences, the psychologies presented have a holistic, contextual, intersubjective, and cultural affinity. Due to their diversity, it is now a matter of offering a meta-scientific, trans-theoretical distillation in order to see psychology as a science, of what? For now, not of the mind, nor of the brain, nor of the behavior, the consciousness or the unconscious. But also without leaving out contents of the different traditions of psychology, for methodological reasons. In this regard, a conception of psychology is proposed that tries to analyze the intricate psychological phenomena by their "natural joints", according to Plato's renowned anatomical image.

Anatomy of psychological phenomena

According to the present approach, the anatomical structure of psychological phenomena involves the conjunction of three terms: subject, behavior, and world. Although all of them are present in the exposed conceptions (of course), they are not present in the same way. Also, none of these terms is univocal, nor is it explained by its ordinary meaning, so it is important to make some clarifications of their meaning here.

Starting with the subject, it refers above all to a corporeal subject, not a thinking subject. The body as the basis of the subject incorporates the history of life, not as something stored somewhere or coded, as cognitive neuroscience likes to hold, but as a *changed*, and changing, *organism*. History, with its experiences, habits and abilities, is incorporated into the organism as a disposition that is put into play in the appropriate contexts and opportune situations. He who knows how to play football or play the piano does not do it because he has the game or music stored somewhere (in his legs, in his hands, or in his brain?) He does so because the organism as a whole is changed in a certain way, resulting from its learning history, which can be updated in the appropriate context. The footballer and the pianist do not have their ability more in the brain than in the legs and hands. The ability is not even in the brain and legs or hands, but in the organism as a whole (without forgetting the brain), in this case the subject. This is not to say that the exchange of the brain would turn the pianist into a soccer player and vice versa. The ability in a certain sense is also in the institutions as relational practices (the rules of the game and the musical scores) that do not merely facilitate but rather co-direct the abilities of the actors.

The structure of the body determines the shape of the human world (*Umwelt*). The upright structure, bipedal walk, freed hands, etc., articulate a from-to structure (Polanyi, 1966, p.11). This corporal structure gives primacy to an operative, practical-

manipulative subject, as opposed to a thinking subject, an "information processor", as the subject is usually characterized. Far from defining the human being, what the thinking subject really does is reveal an intellectualist fallacy strengthened by the division of labor in the industrial society between the office and the production plant, between the management and the "workforce" "This division invites a separation and reification of the "mind" or cerebral cortex as the executive direction *within* and the body as the external executor.

The notion of behavior refers to a whole corporal, affective, cognitive, and operative articulation of the subject with the world, where behavior implies intentionality, know-how and understanding (not the external execution of intentions and internal cognitions). This notion of behavior is inspired by Merleau-Ponty in his 1942 work *The structure of behavior* based on Husserl (operative intentionality) and Heidegger (being-in-the-world), later developed by, among others, Evan Thompson in *Mind in life* (Thompson, 2007) and Thomas Fuchs in *Ecological brain* (Fuchs (2018). It is important to emphasize the gestalt, holistic, non-mechanistic and non-analytically-dismantling nature of this conception, as Merleau-Ponty speaks of the structure of behavior and Mariano Yela in the same vein also speaks of the structure of conduct (Yela, 1974). The behavior or conduct constitutes a structure or dynamic pattern that includes the organism and the environment, the subject and the situation. "The structure of behavior," says Yela, "is the unity of interdependence of the stimulus [situation], the subject, and the action." (Yela, 1974, p. 95).

**TABLE 1
FUNDAMENTAL CONCEPTS OF THE NON-DUALISTIC
CONCEPTIONS CITED**

Constructivist perspective; activity theory; relational evolutionary science	Circularity of the action of the subjects as continuous reorganizers of the world that in turn reopens on the subjects as changed organisms
New Science of the Mind	Embodied processes, located, acted, and extended; world as opening in continuous reconstruction
Contextual Behavioral Science	Relational Frame Theory in the study of cognition and language; functional contextualism
Ecological Psychology	Direct perception; perception-action-perception dynamic; affordances (behavioral properties of the environment)
Cultural Psychology	Scaffolding; proximal development; semiotic artifact (experience guide); internalization/changed organism
Existential Psychology	Human condition (openness, contingency, paradox); basic concerns (meaning, freedom, loneliness, death); experimental paradigm of salience (mortality, uncertainty); cultural patterns as defenses



Behavior in this perspective “is a collective phenomenon,” says Thompson, “which comprises the brain, the body and the environment, not something that resides within the nervous system.” (Thompson, 2007, p. 71). It is understood that this notion of behavior, for which some authors prefer the term “comportment” rather than “behavior”, captures “*this unifying structure of embodied affective (and cognitive) engagement with the world*” (Jacobs, Stephan, Paskaleva-Yankova, & Wilutzky, 2014, p.90, italics in the original). Merleau-Ponty sees this connection as an

intentional arc that projects around us our past, our future, our human contextual environment, our physical situation, our ideological situation, our moral situation or, rather, what makes us be situated under all these relationships. It is this intentional arc that forms the unity of the senses, that of the senses and intelligence, that of sensibility and mobility. It is this arch that is ‘distended’ in the illness. (Merleau-Ponty, 1945/1975, 153)

Like the bridge of the *Invisible Cities* of Italo Calvino described stone by stone or by the arch, behavior is not defined stone by stone (behaviors, perceptions, cognitions, neuronal activity), but by the arch the stones form. Or even better, a circuit in continuous reconstruction according to John Dewey’s classic discussion of the reflex arc, how psychology tends to dismember the phenomena that he calls the “psychological fallacy” (Dewey, 1896). This notion of behavior has served, for example, to reconceive the so-called “ADHD” beyond the symptoms as a way of being (Pérez-Álvarez, 2018c).

The notion of operant behavior in Skinner’s radical behaviorism can be set as a paradigmatic example of behavior in the sense that has been proposed, not without the appropriate specifications. To see it this way it is necessary to remember that operant behavior is part of a three-term-contingency: discriminative stimulus, behavior, and eventual effect. Contingency describes a situation in which certain behavior produces effects that revise the initial situation and successive actions. The necessary specifications consist in understanding that the contingency constitutes a functional, temporary, dynamic, and gestalt unit (Fuentes, 2011; Fuentes & Quiroga, 1999). Operant behavior establishes a functional relationship between a present situation and a co-present future situation, which the behavior itself updates. It is worth saying that behavior operates between the present and the future in a dynamic process. In this sense, operant behavior establishes an “intentional arc” between the subject, the present situation, and a future situation, a unit called “discriminated contingency”. A discriminated contingency is a behavioral process between two phenomenal moments, the present-here and the future-there according to a continuous flow of moment-to-moment transformation (Quiroga, 1996).

For its part, the world already offers itself as discriminated, available, operable in a certain way, not as information to be processed by the mind or the brain. The world is *scaffolding* and *affording* for our behavior with no need for any sort of mental or neural representation whenever the subject and world

mutually constitute each other (Chemero, 2009). Thus, language and writing (the latter for a few centuries now) are part of the everyday world, so their development or rather learning, so “natural” for children, seems instinctive (to the Chomskians) as by a universal grammar or intelligent design housed in a creator brain.

Writing, which children now master in about 2,000 hours, took 6,000 years to be institutionalized, although the anatomical structure of the brain was much earlier. Children now surf the internet with complete mastery in a short time, without any gene for surfing, or for writing, nor probably for language more than a set of predispositions (Sinha, 2015). Babies who survived alone, as in the Galapagos Islands according to an imaginary experiment (Kenneally, 2009), would probably generate no more than stammering forms of communication. How many thousands of years it would take to “generate” languages like the ones we know (or similar), as well as writing. The eventual re-invention of writing would mean in turn the prior invention of agriculture and bartering, if as it seems writing has derived from ways of counting (perhaps a case of exaptation). Once institutionalized, writing reorganizes the language itself as well as the brain’s own functionality (Pérez-Álvarez, 2015).

Language and other artifacts (Sinha, 2015) constitute scaffoldings and availabilities that function as a “ratchet effect”, not only preventing a return, but also accumulating and institutionalizing their own cultural practices (Tennie, Call, & Tomasello, 2009). The ease with which children learn to speak lends itself to the impression that language is inscribed in genes and in the brain. However, it is not so obvious that the language is there waiting for the occasion to be generated. It would be enough to consider the rich scaffolding of the world, not the “poverty of stimuli” according to Chomsky’s objection to Skinner (Primerio, 2008), to see that the universal is in reality the institutional character of the human being, with its scaffoldings and availabilities.

Table 2 attempts to show schematically the different dualist-monistic ontology that reduces psychology as a science of mind and behavior and, where appropriate, cognitive neuroscience, in relation to the tripartite plural ontology of a conception of psychology centered on the subject (not the mind or the brain), behavior (not conduct as an external execution) and the organized world with all its scaffoldings and affordances (not information to be processed).

According to the noted specifications, a conception of psychology is proposed as the science of the subject and behavior (Pérez-Álvarez, 2018a). The inclusion of the subject aims to highlight it as an alternative to the notions of mind and brain that figure in the conceptions of psychology (as a science of the mind and behavior or cognitive neuroscience) that it is wished to overcome, due to the dualism, mentalism and brain-centrism that they involve. In addition, the notion of the subject implies the subjectivity that it is also wished to include in its own right in any self-respecting psychology, and not as biases, hypotheses, or constructs. Nothing psychological should be



alien to psychology, starting with aspects that are subjective pre-reflective, implicit, unconscious, non-verbal, ineffable, the “dark side of the mind” (Everett, 2016). After the “prudishness” of positivist science, so far in the 21st century there seems to be a renewed interest in incorporating the subjective aspects into the science of behavior (Valsiner, 2013, p.257). On the other hand, the reference to behavior aims to highlight the mutually constitutive relationship of the subject with the world that the usual notion of conduct does not seem to have as the external execution of a mind that has a representation of the world.

The peculiarity of psychology as a science

Psychology is a peculiar science. To start with, it deals with interactive realities (not natural fixed ones), influenced by the research process itself (Hacking, 1995; Hauswald, 2016). The objects of psychology are themselves subjects: the most interactive entities of all. Moreover, psychological phenomena consist of ephemeral events and irreversible processes occurring on the frontier of the past and the future: the present (Valsiner, 2013).

However, life is relatively stable thanks to its institutional nature. For this reason, psychological phenomena are also relatively regular. Whilst they are ephemeral and unique, psychological phenomena are still similar, so as to allow generalization based on “principles that govern the emergence of new singularities” (Valsiner, 2014a, p.257). Although they are irreversible processes, psychological phenomena constitute structures with recognizable forms. The notions of discriminated contingency and affordance are examples of structures. The notion of structure or Gestalt is being claimed in psychopathology as an alternative to classification based on symptoms (Pérez-Álvarez & García-Montes, 2018).

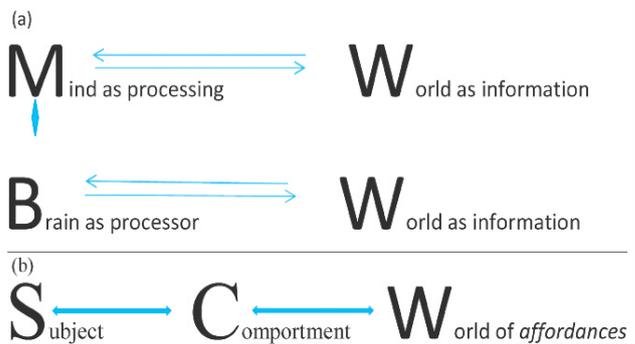
Another peculiarity of psychology is that it is a *liminal* science, in an intermediate field between biology and culture, at the intersection of the natural and human sciences (Valsiner, 2014a, p.6). This condition is at the basis of the traditional problem of psychology, oscillating between its reduction on one side or another, without having clear autonomy regarding what exactly it is a science of. The oscillation today tends to shift towards neuroscientific and biomedical reductionism, but also towards the statistical and algorithmic. In both cases, the psychological phenomena dissipate, whether it is a mechanistic reduction below the level of the subject or supraindividual above the known subject, the non-ergodicity of statistical averages which lack value for the individual case. In ontological terms, the oscillation is between dualism and monism, when the latter is actually a variant of the first, not the alternative that it is assumed to be. In epistemological terms, the oscillation is between the natural sciences and the social sciences. Even recognizing the social and cultural nature of psychology, it is studied as if it were a natural science. On the other hand, as a human science, its status in relation to the other human sciences, between fundamental and dispensable, is not clear either.

Placing psychology on an ontological map

It is important to place psychology on a *pluralistic* ontological map. The alternative to dualism is not monism, but pluralism, as William James noted in his 1909 work *A Pluralistic Universe* (James, 2009). The realities are diverse (being is said in many ways, Aristotle would say): electrons, molecules, stones, gravitational waves, rabbits, ducks, pains, experiences, behaviors, languages, rules, social institutions, laws of polyhedra, theorems, scientific theories, etc. According to the ontology of philosophical materialism, they could be grouped into three major genres of materiality: physical (molecules, gravitational waves), psychological (experiences, behaviors) and supraindividual objective (institutional and abstract). Institutional materiality refers to social norms and practices that organize human life. On the other hand, abstract materiality refers to entities such as geometry and mathematics, of universal scope, but with a historical origin.

Psychological realities, far from being reducible to the biophysical on the one hand or the institutional (social, cultural) on the other, participate in both and what is more are mediators between them. With regards to participation, we speak of an ontological three-dimensionality of psychological phenomena (Lundh, 2018, Pérez-Álvarez, 2018a) always including, in a more or less conspicuous and relevant way, biophysical (neural) and social (institutional) aspects, without being reduced to them. As far as mediation is concerned, the idea is to see that it is the subjects that shape the world and establish constructive (and destructive) relationships between the different realities. The emphasis on the mediation of the subject aims to highlight on the one hand the decisive role of psychological activity in the

TABLE 2
SCHEMATIC COMPARISON OF THE DUALIST-MONIST ONTOLOGY OF PSYCHOLOGY AS A SCIENCE OF MIND AND BEHAVIOR AS WELL AS OF COGNITIVE NEUROSCIENCE (a), IN RELATION TO A TRIPARTITE PLURAL ONTOLOGY OF A PSYCHOLOGY CENTERED ON THE SUBJECT, BEHAVIOR AND THE WORLD (b)



(The arrows in (a) suggest the double input-output process where the world enters as information whose mental-brain processing comes out as behavior. The bidirectional arrows in (b) suggest the mediating nature of the subjects' comportment in a reciprocal relationship with the world.



configuration of other realities and on the other the fact that this psychological activity is not mental or neuronal but behavioral. In order to perceive this double participatory and mediational aspect of psychological phenomena on a pluralist ontological map, a psychological and philosophical analysis of the Necker cube (Pérez-Álvarez, 2017) may be useful.

The Necker cube lends itself to show how a psychological-perceptual-experiential-subjective phenomenon, in this case an ambiguous perception, involves physical aspects (segments of lines drawn on paper, as well as neurophysiological processes of perception) and abstract aspects (geometric laws of polyhedra), without being reduced to them, since without the mediation of an *institutional subject* (with a perceptive history) there is no phenomenon. The phenomenon is not merely neuronal, however much it implies (of course) a complex network of neurophysiological processes. From the given phenomenon (experiential perceptual) one can see what happens in the brain, but from seeing what happens in the brain the phenomenon is not deduced. The phenomenon does not occur directly from the segments at the level of the neurons. The phenomenon does not occur in the neurons, more than in the books of cheap neuroscience. The phenomenon implies a subject with neurons (obviously), but also with a perceptive history. Without experience of cubes (which is practically universal in our society), the phenomenon is not conceivable, just as without having seen ducks and rabbits there would not be the famous ambiguous rabbit-duck perception popularized by Wittgenstein. See Figure 2.

It would be a “scientific fallacy” to try to understand the phenomenon at the molecular level, no matter how much it participates, like explaining the bridge by analyzing the stones. The psychological phenomenon has an entity itself.

Epistemological and methodological implications

The location of psychological phenomena on an ontological map has epistemological implications related to the type of science that psychology is. The options are basically reduced to two: whether psychology is a natural science or a human

science. According to the argumentation followed, psychology is a human science.

Without the hallmark of natural science, psychology is still a science, a type of human science. Within this, the social, cultural, hermeneutical, or behavioral emphasis could be debated. In view of the emphasis placed on the behavioral activity of the subject, we speak of psychology as a behavioral science, centered on the human subject (person).

The ontological pluralism is correlative of a pluralist methodology in accordance with the complexity of the psychological phenomena. Psychological phenomena being ephemeral, unique, and irreversible, they suit methods centered on the present such as, for example, the microanalytic interview (Stern, 2004/2014), on the lived experience, such as the semi-structured interview in psychosis (Pérez-Álvarez & García-Montes, 2018), and on behavior in a dynamic longitudinal perspective, personalized and contextualized in real time as enabled by the promising network analysis (Fonseca-Pedrero, 2018).

As Svend Brinkmann says, “psychologists could ask any relevant research question, and use any methodology and technique that was needed in order to adequately address their research question, without much thought as to whether this was a qualitative or a quantitative approach.” (Brinkmann, 2015, p.171). Then, one could be at the level of the natural sciences, which do not have the typical dispute of the scientific method that exists in psychology. As Michael Mascolo says, on this matter,

A debate over whether a given discipline is or is not a science would seem to be more of a battle about status and prestige than about identifying alternative pathways to reliable knowledge. A better question might be, given its subject matter, how can we study psychological processes in systematic, reliable and useful ways? If such conditions can be satisfied, the question of whether or not disciplinary practices are scientific would be irrelevant. (Mascolo, 2016, p.553).

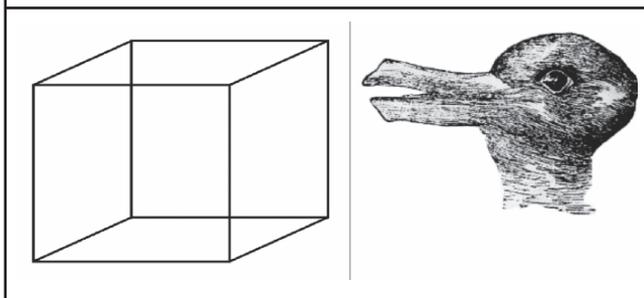
CONCLUSIONS

After indicating certain problems of the standard conception of psychology as a science of mind and behavior and, as the case may be, as cognitive neuroscience, a variety of alternative non-dualist and non-brain-centrist conceptions have been presented. On the basis of these alternatives, a trans-theoretical conception of psychology as science of the subject and behavior has been proposed (Pérez-Álvarez, 2018a).

It is understood that a double reference in psychology, in this case, of subject and behavior, is highly appropriate, because a single one would be too indeterminate or perhaps deterministic due to being reductive, and more than two, adding for example situation, context or world, could be redundant. The reference to behavior (conduct, activity, action) seems unquestionable. How it is conceived is another matter. The conception of behavior offered here overcomes the mechanistic sense that is usually associated with behavior as an external execution, as well as the

FIGURE 2

WITHOUT A HISTORY OF CUBES, LIKE WITHOUT HAVING SEEN DUCKS AND RABBITS, THE PERCEPTIVE AMBIGUITY IS NOT CONCEIVED; SO OBVIOUS THAT IT CANNOT BE IGNORED GIVEN THE NEUROCENTRIC TENDENCY AS IF THE NEURONAL IMPLICATION EXHAUSTED THE PHENOMENON





self-emanating aspect suggested by the notions of activity and action as if they emanated from the subject outside the world to which the subjects are “subjected” with their history and affordances. In any case, the question is not so much the term (behavior, conduct, activity, action), as its meaning in reference to a subject because the behavior *is* of a subject, *dixit* José Luis Pinillos.

The reference to a subject is necessary as opposed to the notions of mind or brain due to the mereological fallacy of attributing to a part what is of a whole, in addition to its dualistic, mentalist, reductionist character, the redivived homunculus or phantom in the machine. On the other hand, the notion of subject *incorporates* subjectivity in its continuous reconfiguration of experiences and *behavioral* availabilities, without the need to assume storages, codifications, representations, or other mechanistic devices. Similarly, the notion of the subject allows one to better understand one’s relationship with oneself as a subject that takes itself as a theme and problem. The notion of a person would also be good (Martin & Bickhard, 2012).

CONFLICT OF INTERESTS

The author declares that he has no conflict of interest with regard to this article.

REFERENCES

- American Psychological Association (2018). *APA Dictionary of Psychology*. <https://dictionary.apa.org/psychology> (consultado el 14/5/2018)
- Asay, J. (2018). The role of truth in psychological science. *Theory & Psychology, 28*, 382–397. doi.org/10.1177/0959354317752875
- Brinkmann, S. (2015). Perils and potentials in qualitative psychology. *Integrative Psychological and Behavioral Science, 49*, 162–173. DOI 10.1007/s12124-014-9293-z
- Carleton, R. C. (2016). Into the unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders, 39*, 30–43. doi.org/10.1016/j.janxdis.2016.02.007
- Chemero, A. (2009). *Radical embodied cognitive science*. Cambridge, MA: MIT Press.
- Dewey, J. (1896). The Reflex Arc Concept in Psychology. *Psychological Review, 3*, 357–370.
- Estany, A., & Martínez, S. (2014). “Scaffolding” and “affordance” as integrative concepts in the cognitive sciences. *Philosophical Psychology, 27*, 98–111. doi.org/10.1080/09515089.2013.828569
- Everett, D. L. (2016). *Dark matter of the mind. The culturally articulated unconscious*. Chicago: Chicago University Press.
- Fanelli D (2010) “Positive” Results increase down the hierarchy of the sciences. *PLoS ONE 5*(4): e10068. 10.1371/journal.pone.0010068
- Ferguson, C. J. (2015). “Everybody knows psychology is not a real science”: Public perceptions of psychology and how we can improve our relationship with policymakers, the scientific community, and the general public. *American Psychologist, 70*, 527–542. doi: 10.1037/a0039405.
- Fonseca-Pedrero, E. (2018). Análisis de redes en psicología [Network analysis in psychology]. *Papeles del Psicólogo, 39*, 1–12.
- Fuchs, T. (2018). *Ecology of the brain. The phenomenology and biology of the embodied mind*. Oxford: Oxford University Press.
- Fuentes, J. B. (2011). El conductismo en la historia de la psicología: Una crítica de la filosofía del conductismo radical [Behaviorism in the history of psychology: A critique of the philosophy of radical behaviorism]. *Psychologia Latina, 2*, 144–157. doi.org/10.5209/rev_PSLA
- Fuentes, J. B., & Quiroga, E. (1999). El significado del concepto de contingencia generalizada para la psicología [The meaning of the concept of generalized contingency for psychology]. *Acta Comportamental, 7*, 183–203.
- Gerrig, R. J. (2014). *Psychology and life* (20th Edition). Harlow, UK: Pearson.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. New York: Psychology Press.
- Greenberg, J., Koole, S. L., & Pyszczynski, T. (2004). *Handbook of experimental existential psychology*. New York: Guilford.
- Hacking, I. (1995). The looping effect of human kinds. In D. Sperber, D. Premack & A.J. Premack (Eds.), *Causal cognition: A multidisciplinary debate* (pp. 351–383). Oxford: Clarendon Press.
- Hauswald, R. (2016). The ontology of interactive kinds. *Journal of Social Ontology, 2*, 203–221. doi:10.1515/jso-2015-0049
- Hayes, J., Schimel, J., Arndt, J., & Faucher, E. H. (2010). A theoretical and empirical review of the death-thought accessibility concept in terror management research. *Psychological Bulletin, 136*, 699–739. DOI: 10.1037/a0020524
- Hayes, S. C. (2004). Acceptance and Commitment Therapy, Relational Frame Theory, and the third wave of behavior therapy. *Behavior Therapy, 35*, 639–665, doi.org/10.1016/S0005-7894(04)80013-3.
- Hayes, S. C., Barnes-Holmes, D., & Roche, B. (2001). *Relational Frame Theory: A PostSkinnerian account of human language and cognition*. New York: Plenum Press.
- Hayes, S. C., Barnes-Holmes, D., & Wilson, K. G. (2012). Contextual behavioral science: Creating a science more adequate to the challenge of the human condition. *Journal of Contextual Behavioral Science, 1*, 1–16. doi: 10.1016/j.jcbs.2012.09.004
- Hayes, S. C., Hayes, L.J., Reese, H.W., & Sarbin, T.R. (Eds.). (1993). *Varieties of scientific contextualism*. Reno, NV: Context Press.
- Hayes, S. C., & Hofmann, S. G. (2018). *Process Based CBT: The Science and Core Clinical Competencies of Cognitive Behavioral Therapy*. Oakland, CA: Context Press.
- Hayes, S. C., Sanford, B. T., & Chin, F. (2017). Carrying the baton: Evolution science and a contextual behavioral



- analysis of language and cognition. *Journal of Contextual Behavioral Science*, 6, 314-328. doi:10.1016/j.jcbs.2017.01.002
- Heft, H. (2012). The foundations of ecological psychology. In S. Clayton (Ed.), *Handbook of Environmental and Conservation Psychology* (pp. 1-40). New York: Oxford University Press.
- Held, R., & Hein, A. (1963). Movement-produced stimulation in the development of visually guided behavior. *Journal of Comparative and Physiological Psychology*, 56, 872-876. doi.org/10.1037/h0040546
- Heras-Escribano, M., & De Pinedo-García M (2018) Affordances and landscapes: Overcoming the nature-culture dichotomy through Niche Construction Theory. *Frontiers in Psychology*, 8, 2294. doi: 10.3389/fpsyg.2017.02294
- Iso-Ahola, S. E. (2017). Reproducibility in psychological science: When do psychological phenomena exist? *Frontiers in Psychology*, 8, 879. doi.org/10.3389/fpsyg.2017.00879
- Jacobs, K., Stephan, A., Paskaleva-Yankova, A., & Wilutzky, W. (2014). Existential and atmospheric feelings in depressive comportment. *Philosophy, Psychiatry, & Psychology*, 21 89-110. *Project MUSE*, doi:10.1353/ppp.2014.0021
- James, W. (2009). *Un universo pluralista [A pluralist universe]*. Buenos Aires: Cactus.
- Kaaronen, R. O. (2017). Affording sustainability: Adopting a theory of affordances as a guiding heuristic for environmental policy. *Frontiers in Psychology*, 8, 1974. doi.org/10.3389/fpsyg.2017.01974
- Kenneally, C. (2009). *La primera palabra. La búsqueda de los orígenes del lenguaje [The first word. The search for the origins of language]*. Madrid: Alianza.
- Lundh, L. G. (2018). Psychological science within a three-dimensional ontology. *Integrative Psychological and Behavioral Science*, 52(1):52-66. doi.org/10.1007/s12124-017-9412-8
- Merleau-Ponty, M. (1945/1975). *Fenomenología de la percepción [The phenomenology of perception]*. Barcelona: Península.
- Mammen, J., & Mironenko, I. (2015). Activity theories and the ontology of psychology: learning from Danish and Russian experiences. *Integrative Psychological & Behavioral Science*, 49(4), 681-713. doi: 10.1007/s12124-015-9313-7
- Martin, J., & Bickhard, M. (Eds.). (2012). *The Psychology of personhood: Philosophical, historical, social-developmental, and narrative perspectives*. Cambridge: Cambridge University Press. doi:10.1017/CBO9781139086493
- Mascolo, M. F. (2016). Beyond objectivity and subjectivity: The Intersubjective foundations of psychological science. *Integrative Psychological and Behavioral Science*, 50, 543-554. DOI 10.1007/s12124-016-9357-3
- Mischel, W. (2009). The toothbrush problem. *Association for Psychological Science Observer*, 21, 11.
- Mudrik, L., & Maoz, U. (2014). "Me & my brain": Exposing neuroscience's closet dualism. *Journal of Cognitive Neuroscience* 27, 211-221. doi:10.1162/jocn_a_00723
- Open Science Collaboration (2015). Estimating the reproducibility of psychological science. *Science*, 349, DOI: 10.1126/science.aac4716
- Ortega y Gasset, J. (1981). *Investigaciones psicológicas [Psychological research]*. Madrid: Alianza.
- Overton, W. F., & Lerner, R. M. (2014). Fundamental concepts and methods in developmental science: A relational perspective. *Research in Human Development*, 11, 63-73, DOI: 10.1080/15427609.2014.881086
- Pepper, S. C. (1942/1970). *World hypotheses: A study in evidence*. Berkeley: University of California Press.
- Pérez Álvarez, M. (2015). Reflexividad, escritura y génesis del sujeto moderno [Reflexivity, writing, and genesis of the modern subject]. *Revista de Historia de la Psicología*, 36, 56-90.
- Pérez-Álvarez, M. (2017). Psicología y filosofía del cubo de Necker: Para superar el dualismo con el materialismo filosófico [Psychology and philosophy of the Necker cube: To overcome dualism with philosophical materialism]. *Abaco. Revista de Cultura y Ciencias Sociales*, 3, nº93, 68-74.
- Pérez-Álvarez, M. (2018a). Psychology as a science of subject and comportment, beyond the mind and behavior. *Integrative Psychological and Behavioral Science*, 52 (1), 25-51. doi.org/10.1007/s12124-017-9408-4
- Pérez-Álvarez, M. (2018b). La psicología más allá del dualismo y el cerebrocentrismo [Psychology beyond dualism and braincentrism]. *Apuntes de Psicología*.
- Pérez-Álvarez, M. (2018c). *Más Aristóteles y menos Concerta® Las cuatro causas del TDAH [More Aristotle and less Concerta® The four causes of ADHD]*. Barcelona: NED.
- Pérez-Álvarez, M., & García-Montes, J. M. (2018). Evaluación fenomenológica más allá de los síntomas [Phenomenological evaluation beyond the symptoms]. In E. Fonseca (Eds.), *Evaluación de los trastornos del espectro psicótico [Assessment of psychotic spectrum disorders]* (pp.331-363). Madrid: Pirámide.
- Pinillos, J. L. (1975). *Principios de psicología [Principles of psychology]*. Madrid: Alianza.
- Polanyi, M. (1966). *The tacit dimension*. Gloucester, Mass.: Peter Smith.
- Primerio, G. G. (2008). Actualidad de la polémica Chomsky-Skinner [An update on the Chomsky-Skinner controversy]. *Revista Brasileira de Terapia Comportamental e Cognitiva*, 10, 263-279.
- Quiroga, E. (1996). La corriente de la conciencia de W. James como corriente de contingencias discriminadas [W. James's stream of consciousness as a stream of discriminated contingencies]. *Psicothema*, 8, 279-289.
- Ramstead, M. J. D., Veissière, S. P. L., & Kirmayer, L. J. (2016). Cultural affordances: Scaffolding local worlds through shared intentionality and regimes of attention. *Frontiers in Psychology*, 7, 1090. doi.org/10.3389/fpsyg.2016.01090
- Rietveld, E., & Kiverstein, J. (2014) A rich landscape of affordances. *Ecological Psychology*, 26, 325-352. doi.org/10.1080/10407413.2014.958035



- Rowlands, M. (2010). *The new science of mind. From extended mind to embodied phenomenology*. Cambridge, Mass: The MIT Press.
- Sánchez, J. C., & Loredó, J. C. (2007). In circles we go: Baldwin's theory of organic selection and its current uses: A constructivist view. *Theory & Psychology, 17*, 33–58. doi:10.1177/0959354307073150
- Sánchez, J.C., & Loredó, J.C. (2009). Constructivisms from a genetic point of view: A critical classification of current tendencies. *Integrative Psychological and Behavioral Science, 43*, 332-349. doi.org/10.1007/s12124-009-9091-1
- Schacter, D. L., Gilbert, D. T., Wegner, D. M., & Nock, M. K. (2015). *Psychology* (3rd edition). Basingstoke: Palgrave MacMillan.
- Schneider, K.J. (1999). *The paradoxical self: Toward an understanding of our contradictory nature*. Buffalo, NY: Prometheus Press.
- Sinha, C. (2015). Language and other artifacts: socio-cultural dynamics of niche construction. *Frontiers in Psychology, 6*, 1601. doi.org/10.3389/fpsyg.2015.01601
- Stavrova, O., Ehlebracht, D., & Fetchenhauer, D. (2016). Belief in scientific-technological progress and life satisfaction: The role of personal control. *Personality and Individual Differences, 96*, 227-236. doi.org/10.1016/j.paid.2016.03.013
- Stern, D. N. (2004). *El momento presente en psicoterapia y en la vida cotidiana [The present moment in psychotherapy and in everyday life]*. Santiago de Chile: Cuatrocientos.
- Stewart, J., Gapenne, O., & Di Paolo, E. A. (Eds.). (2010). *Enaction: Toward a new paradigm for cognitive science*. Cambridge, MA: MIT Press.
- Sullivan, D. (2016). *Cultural-Existential Psychology: The role of culture in suffering and threat*. Cambridge: Cambridge University Press.
- Tennie, C., Call, J., & Tomasello, M. (2009). Ratcheting up the ratchet: on the evolution of cumulative culture. *Philosophical Transactions of the Royal Society B: Biological Sciences, 364*(1528), 2405–2415. http://doi.org/10.1098/rstb.2009.0052
- Thompson, E. (2007). *Mind in life. Biology, phenomenology, and the sciences of mind*. Cambridge, MA: Harvard University Press.
- Turvey, M. T., Shaw, R., Reed, E. S., & Mace, W. (1981). Ecological laws for perceiving and acting: a reply to Fodor and Pylyshyn. *Cognition 10*, 237–304. doi: 10.1016/0010-0277(81)90002-0
- Valisner, J. (2013). *A guided science. History of psychology in the mirror of its making*. New Brunswick: Transactions Pub.
- Valsiner, J. (2014a). *An invitation to cultural psychology*. London: Sage.
- Valsiner, J. (2014b). Needed for cultural psychology: Methodology in a new key. *Culture & Psychology, 20*, 3 – 30. doi.org/10.1177/1354067X13515941
- Valsiner, J., Marsico, G., Chaudhary, N., Sato, T., & Dazzani, V. (Eds.). (2016). *Psychology as the science of human being. The Yokohama Manifesto*. Cham, Switzerland: Springer.
- Van den Bos, K. (2009). Making sense of life: The existential self trying to deal with personal uncertainty. *Psychological Inquiry, 20*, 197-217. doi.org/10.1080/10478400903333411
- Witherington, D.C. & Lickliter, R. (2016). Integrating development and evolution in psychological science: evolutionary developmental psychology, developmental systems, and explanatory pluralism. *Human Development, 59*, 200-234. doi.org/10.1159/000450715
- Yela, M. (1974). *La estructura de la conducta. Estímulo, situación y conciencia [The structure of behavior. Stimulus, situation and consciousness]*. Madrid: Real Academia de Ciencias Morales y Políticas [Royal Academy of Moral and Political Sciences].
- Zettle, R. D., Hayes, S. C., Barnes-Holmes, D., & Biglan, A. (2016). *The Wiley handbook of contextual behavioral science*. John Wiley & Sons.
- Zilio, D. (2016). On the autonomy of psychology from neuroscience: A case study of Skinner's radical behaviorism and behavior analysis. *Review of General Psychology, 20*, 155-170. doi.org/10.1037/gpr0000067
- Zittoun, T., & Gillespie, A. (2015) Internalization: How culture becomes mind. *Culture & Psychology, 21* (4), 477-491. DOI: 10.1177/1354067X15615809
- Zittoun, T., & Gillespie, A. (2016). *Imagination in human and cultural development*. London: Routledge.
- Zittoun, T., Valsiner, J., Vedeler, D., Salgado, J., Gonçalves, M., & Ferring, D. (2013). *Human development in the life course: Melodies of living*. Cambridge, UK: Cambridge University Press.

