Chapter 5
The Molar View of Behavior: A Paradigm Shift in Behavior Analysis?

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The molar view of behavior is presented as a new scientific paradigm in behavior analysis. The term paradigm does not seem to have been used in a fortuitous way. Resorting to Thomas Kuhn, Baum (2002) elucidated the magnitude of his proposal: the molar behavior-analytic view involves ontological and epistemological claims that signal incommensurable interpretations with another scientific paradigm, the molecular view of behavior. As described by the proponent, "its implications are profound" (Baum, 2021). I examine the "level of profundity" of what I consider to be some of the implications of the molar view of behavior. The molar model enables an integration between philosophy and science in behavior analysis, retrieving a genuine sense of behaviorism (high profundity). Since Skinner's view of behavior was characterized as a "molecular" one, the contrast between the molar and the molecular approaches is not so sharp when changes in the Skinnerian explanatory model are considered (medium profundity). Finally, I argue that the implications of the molar view do not seem to be that profound when behavior is understood within the framework of a gene-centered evolutionary theory.

The Molar View and Its Integrative Potential in Behavior Analysis

As a paradigm, the molar view changes the ontological conception of behavior (Baum, 2002, 2021). In the molar view, behavior is an aggregate of activities, which are processes and individuals. This means that behavior is an interaction with the

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environment that extends over time (i.e., process), whose parts (other activities) operate together in an integrated and concrete whole, serving a function (i.e., individual). As a process, behavior changes, but it does so without losing its identity (Baum, 2021). The preservation of that "identity" is understood by looking at the behavior as an integrated entity (a whole) and not at its constituent parts. It is that whole (the individual) that remains over time. Therefore, it is the operant as a process that is mutable. It is the operant as an individual (concrete) that changes the environment, preserving its "historical continuity" (Baum, 2002, p. 108).

In the molecular view, behavior is defined by the objects' ontological characteristics of stability and repeatability and by the classes' unchangeable and innocuous feature. This means that behavior consists of discrete responses susceptible of repetition that are fixed in a class when they meet the class defining attributes (Baum, 2021). If those attributes change, a new class can be identified and not a change in the same class; "the only change associated with a class is in the number of its instances" (Baum, 2002, p. 107). As an object and class, the operant is neither changeable nor changing the environment (Baum, 2021).

The molar view of behavior also produces changes in the epistemological level. In the molecular view, the *analysis* describes a relation between class and instance, which occurs in a static and atomistic record (would behavior be a sum of elements?). In the molar view, the *analysis* of behavior follows a part-whole logic that is dynamic and organic (would behavior be a *Gestalt*?). The law of allocation sums up the ontological characteristics of behavior and demarcates the research field of the behavior analyst (choice or time allocation). If behavior is an aggregate of activities (which are processes and individuals), "the key task of behavior analysis is explaining the allocation of time among all the organism's activities" (Baum, 2021). At this point, the multiscale perspective becomes pivotal in a molar view. Since it is an activity extended over time, behavior cannot be described as an activity that occurs at a moment. However, behavior can be analyzed in any time scale, going from milliseconds to years. What scale is going to be used will depend on the context of the study (inside or outside the laboratory) and on the different investigative resources for measuring activities (recording of behavior through videographic recordings, self-report, etc.), once they are clearly identified (Baum, 2021).

Although concepts only make sense within a specific paradigm, hence their incommensurable character, Baum (2021) does not only reinterpret concepts that are related to the molecular paradigm (e.g., reinforcement, punishment, stimulus control, strength of response), but he also highlights the advantages of the molar behavior-analytic view. In the experimental domain, for example, the molar view is able to explain behavioral processes that are not easily elucidated in a molecular view, such as the differences in response rates between ratio schedules (high response rates) and interval schedules (moderate response rates), as well as negative reinforcement (avoidance, in particular) (Baum, 2021). Furthermore, the law of allocation makes it possible to explain impulsive choice responses and resurgence (see also Baum, 2002, pp. 100–106).

In contrast to the molecular view, Baum (2002) argues that the molar view of behavior has a higher external validity, in the sense that it is closer to the way people talk about their lives. The image here is more of a set of rhizomes, with each activity ramifying into others, than a "time line of discrete events, one following another" (p. 111). The time spent in each one of the activities depends on the reinforcement rate that is correlated to them, among other variables (see Baum, 2002, p. 104).

A molar conception of behavior seems to be better suited to dialogue with selection as a causal mode, which is, by definition, historical and, thus, grounded on changes over time (Baum, 2021). As a science that deals with changes, evolutionary biology explains changes on species; behavior analysis explains changes on behavior. Just like species, behavior (as an individual and not as a class) changes without losing its identity, and the processes of selection are what explain those changes: "in the molar view, reinforcement is a process of selection, resembling natural selection" (Baum, 2002, p. 106).

Although Baum (2021) considers behavior analysis to be a branch of biology and not properly a psychology, molar behaviorism allows to understand psychological phenomena (e.g., thoughts and feelings) as observable activities that extend over time and not as private events. Because of its emphasis on immediate and nonhistorical causes, the molecular paradigm can resort to "interpretation" when no immediate observable cause is identified (e.g., a private stimulus known as "pain") (Baum, 2021).

The molar paradigm dismisses the notion of an agent to elucidate the active character of behavior. Behavior is not done by an agent (an inner "self" of mental or cerebral nature); behavior is "agentic" in the sense that it is the concrete (individual) activity that changes the world. The same reasoning can be applied to the notion of choice: it is not necessary to hypostatize a "self" behind choices, because behaving is choosing (allocating time among a set of activities) (Baum, 2021), and choosing is behaving (interacting with the environment).

Molar behaviorism actualizes the original notion of behaviorism: a philosophy that considers behavior to be a subject matter in its own right. Since it understands behavior as activities that extend over time, molar behaviorism "expands" the behavioral field, so that the explanation resorts to historical processes of selection, instead of inferences of immediate internal causes (e.g., private events). Likewise, this "enlargement" of the behavioral field allows complex psychological phenomena to be explained scientifically and historically *within behavior*, without appealing to another level of explanation (e.g., mental or cerebral).

A merit that deserves to be highlighted in Baum's proposal is the possibility of articulating theoretical (ontological and epistemological) and empirical aspects in a coherent whole. More specifically, the ontological notion of behavior (historical entity) is compatible with types of analysis (multiscale), behavioral laws (the law of allocation), and evolutionary theory. Thus, there is a possibility of integration between philosophy of science (molar behaviorism) and science (multiscale behavior analysis) in an evolutionary and selectionist matrix.

The Molar Behavior-Analytic View: A Post-Skinnerian Proposal?

Baum (2002, 2021) quotes B. F. Skinner as a representative of the molecular view of behavior. If "the view that behavior consists of discrete responses that are strengthened by closely following (contiguous) reinforcers may be identified as the molecular view of behavior" (Baum, 2021), and if Skinner "never went beyond the 'operant' as a class of discrete responses or the theory that an immediately following reinforcer 'strengthens' an operant response" (Baum, 2021), then the Skinnerian view of behavior coincides with the molecular paradigm.

To support this argument, Baum (2002, 2021) mentions Skinner's texts, especially from the 1930s (e.g., *The generic nature of the concepts of stimulus and response*, *The behavior of organisms*) but also from the 1940s (*"Superstition" in the pigeon*) and 1950s (e.g., *Are theories of learning necessary?*, *The experimental analysis of behavior*), which provided the theoretical and empirical basis for the formulation of concepts (e.g., response class, response rate) criticized from a molar behavior-analytic perspective (see Baum, 2002, p. 96). In addition, Baum (2002) suggests that Skinner, when compared to other authors, seems to have belatedly acknowledged (in 1981) the parallel between behavioral processes and natural selection: "Possibly Ashby (1954) was the first to recognize the parallel between reinforcement and natural selection. Campbell (1956) spelled out the idea that reinforcement is a type of selection, and R. M. Gilbert (1970) and Staddon and Simmelhag (1971) elaborated it further. Skinner (1981) himself proposed it eventually" (Baum, 2002, p. 98).

After that supposedly late acknowledgment of the parallels between natural selection and reinforcement, Skinner seems to have supported two different conceptions of the process of reinforcement, a molecular one and a selectionist one: "Instead of thinking of reinforcement as a sort of 'moment of truth', defined by contiguity with a momentary response, we may think of reinforcement as a cumulative effect, as selection through time, shaping patterns of behavior (activities) in lineages" (Baum, 2002, p. 113).

Selectionism (selection as explanatory model) is a distinctive aspect of the molar view of behavior. At some extent, both the ontological characteristics (behavior is processual and individual) and the epistemological ones (allocation) seem to be elucidated by selection as a "causal mode" (changes over time without identity lost, etc.), "a completely different and fundamentally historical type of causality" (Baum, 2002, p. 106).

Despite not being a consensual interpretation, studies indicate changes in Skinner's work ranging from mechanism to selectionism (Cruz & Cillo, 2008; Micheletto 1997; Moxley, 1999). For some interpreters, selectionism seems to have acquired sharper contours in the 1950s and 1960s (Carneiro Leão & Carvalho Neto, 2018), while for others, like Palmer and Donahoe (1992), selectionism has been present in Skinner's work since 1930.

Seeing the changes in the Skinnerian explanatory model of behavior, some of them oriented toward selectionism, what would be the scope of the molecular interpretation of Skinner's view of behavior? Would this interpretation be valid for almost the entire extent of Skinner's work (at least until 1981), as suggested by Baum? Or would it be valid only for Skinner's formulations of the 1930s and 1940s, a period in which selectionism was not yet in evidence, according to some interpreters (Carneiro Leão & Carvalho Neto, 2018; Moxley, 1999)?

It is also important to point out that conspicuous parallels between operant reinforcement and natural selection had already been made by Skinner in texts prior to the one published in 1981 (e.g., Skinner, 1953/2005, pp. 90, 222, 430; Skinner, 1968/2003, pp. 174–176; Skinner, 1971, pp. 23, 30; Skinner, 1972/1999, pp. 359–360; Skinner, 1974, pp. 114, 224). If the roots of the molar paradigm "may be traced back to the 1960s, but it became clearly visible in the 1970s" (Baum, 2002, p. 95), and if the parallels between reinforcement and natural selection – one of the distinctive characteristics of this paradigm – can already be found in Skinner in the 1950s, to what extent would the molar proposal of behavior be a "post-Skinnerian" one, in the sense of signaling a rupture with the molecular paradigm? An even more curious fact is that the classic paper quoted by Palmer and Donahoe (1992) to argue that selectionism was already present in Skinner in the 1930s, *The generic nature of the concepts of stimulus and response*, is the same that Baum (2002) used to identify Skinner as a representative of the molecular paradigm of behavior (p. 96).

If selectionism is a hallmark of the molar paradigm, and if Skinner's explanatory model can be considered selectionist (Chiesa, 1992), either Skinner shares a molar view of behavior (the question would merely be about the exact moment he started doing so) or selectionism does not seem to be a sufficient condition, despite it being a necessary one, to characterize the molar paradigm. If selectionism is not a sufficient condition to define the molar view of behavior, which would be its distinctive aspects, besides selectionism? If it is possible to conciliate selectionism with notions of the molecular paradigm (such as the notion of operant as a response class), what would be the fracture lines with the molecular paradigm?

I think that elucidating these issues could help to ascertain the relationships between molar view and selectionism (and Skinner's position in this discussion), as well as the shift paradigm brought about by the molar approach in behavior analysis, as claimed by Baum.

The Molar View in Evolutionary Theory: Revolving Around the Genes

A molar view of behavior had already been proposed by Edward C. Tolman (1932/1967). For this behaviorist, a molar definition of behavior emphasizes the emergent properties of behavior in relation to physiology. In spite of its dependence

on the physiology of organisms, behavior cannot be explained in terms of physiological properties, for it requires its own concepts and principles. In Tolman (1932/1967)'s words: "behavior, as such, is more than and different from the sum of its physiological parts. Behavior, as such, is an 'emergent' phenomenon that has descriptive and defining properties of its own. And we shall designate this latter as the *molar* definition of behavior" (p. 7). Based on Tolman's definition, Skinner (1944/1989) criticized Clark L. Hull for having abandoned a molar perspective and having resorted, instead, to neurological dimensions to explain behavior: "The exigencies of his method have led him to abandon the productive (and at least equally valid) formulation of behavior at the molar level and to align himself with the semi-neurologists" (p. 288).

Despite not using the word "emergent," the "molar" view presented by Baum (2021) seems, in some sense, to be close to Tolman's, for molar behaviorism marks off behavior as primordial. In fact, it is the conception that behavior is a "subject matter in its own right" that stands at the very base of Baum's argument about behavior analysis not being a part of psychology: "For psychology, behavior is a superficial phenomenon that must be understood by inferences to a 'deeper' level: the mind or the brain." Moreover, behavior is an activity of the organism as a whole, like it was described in axiom 1, and not of parts of the organisms: "My heart's beating may be part of my physiology, but it is not part of my behavior" (Baum, 2021).

Behavior analysis is, then, part of biology, for "biologists … have no trouble thinking about behavior as real and primary. Biologists who I talk to readily accept the idea that behavior is an organism's interaction with the environment." Thus, Baum (2021) puts behavior analysis in touch with evolutionary biology and discusses behavior from an evolutionary perspective. The notion of evolution used in the interface with biology seems to be the gene-centered version of neo-Darwinism: "The perspective offered by evolutionary theory, that organisms exist to reproduce, may be summarized as, 'Organisms are the means by which DNA makes more DNA'". From this evolutionary viewpoint, "… the behavior only exists because organisms exist. Organisms exist because the genes that make for organisms reproduce more successfully than competing genes that would undo organisms – that is, the genes that produce and reside in organisms have higher fitness than any competitors" (Baum, 2021).

It is true that Baum (2021) does not disregard the role of behavior in evolution, as he says that "the success of the organism-making genes relies on the organism's interaction with the environment around it." However, behavior loses prominence in a gene-centered version of Darwinian theory, which Baum's molar view seems to rest upon. Without subscribing to the thesis of direct information transference from phenotype to genotype, there are other evolutionary approaches in which behavior plays a more relevant role in evolution (e.g., "new synthesis" (Jablonka & Lamb, 2005, 2008) or an "extended synthesis" (Pigliucci, 2009; Pigliucci & Müller, 2010)). Within the framework of these evolutionary theories, behavior can interfere in life conditions, and it can consequently affect the way natural selection operates, as described, for example, by the niche construction theory (see Odling-Smee, 2010; Shavit & Griesemer, 2011). Behavior could also have an evolutionary impact when it becomes a cultural practice or tradition, being spread along generations, affecting

populations, and creating specificities that could intervene in the process of the evolution of the species (Galef Jr. & Laland, 2005; Jablonka & Lamb, 2005). Human culture, for example, due to its verbal and symbolic character, can create conditions for survival and reproduction that would possibly exist just in the context of these practices.

The issue raised by those other evolutionary perspectives is that the concept of heredity should be broadened ("there is more to heredity than genes"), covering other inheritance systems besides genetics, such as the epigenetic, behavioral, and symbolic ones (Jablonka & Lamb, 2005, p. 1). Therefore, genes would not be the center which organism and behavior revolve around. Ultimately, there does not seem to be a "center" in those theories but, instead of that, different heredity systems that are interconnect and mutually influenced by each other. It is not Darwin's theory of evolution through natural selection that is being challenged but "the prevalent gene-based unidimensional version of it. There are four dimensions to heredity, and we should not ignore three of them. All four have to be considered if we are to attain a more complete understanding of evolution" (p. 4).

If behavior analysis in not a part of psychology, for psychology deals with behavior as if it were a symptom of something "deeper" (mind or brain) (Baum, 2021), evolutionary biology, at least in Baum's definition of evolution, seems to also see behavior as a "symptom" of something "deeper," the genes. This aspect has important implications when it comes to explaining culture from an evolutionary viewpoint, as well as explaining the role of culture in evolution. Baum (2021) argues that "evolutionary theory helps to understand why many human activities exist that otherwise would have no explanation. Even though activities like art, music, and religion might seem to have little connection to reproducing, they can be fitted into the larger context of evolution." Nonetheless, in certain "cultures," there are contingencies of social reinforcement maintained by groups that are the context for choices (time allocation) that go against the individual's and the species' survival (e.g., consumerist and predatory cultural practices, certain food practices). In sum, these cultures "created" reinforcers that seem to go against survival.

On the other hand, there are also exploitative and oppressive "cultures" (e.g., neoliberal, capitalist, racist, sexist, and classist cultures) that benefit some groups to the detriment of others and that have "survived" over time. When it comes to these cultures, some privileged groups (and the individuals that belong to them) maintain health, gain resources, and maintain relationships at the expense of the exploitation of other groups.

If, as argued by Baum (2021), the molar view can also have implications on the practical life, how would it be possible to deal with cultures that not only foster (i.e., reinforce) choices that endanger the survival of the species but that also "survive" to the expense of high social inequality indexes? Considering that "the advantages to the molar view lie in its ability to integrate experimental results, in its promotion of quantitative theory, and in its applicability to everyday life" (Baum, 2002, p. 114) and that ethical and political problems are part of daily life, how can we think about these sociocultural issues from a molar view of behavior aligned with a gene-centered evolutionary theory? This is yet another set of issues that would need to be addressed in a more systematic way by the molar proposal.

Conclusion

Baum (2002, 2021) claims that the molar view of behavior is responsible for a paradigm shift in behavior analysis. Paradigm shifts are, in fact, profound. The molar approach has a (profound) potential for integrating philosophy (behaviorism) and empirical data (behavioral science) in an evolutionary framework.

The differences between molar view and molecular view lose profundity when selectionist interpretations of Skinner's view of behavior are brought to the fore. Would selectionism be a necessary condition (though not sufficient) to define the molar view? If so, what determines incommensurability with the molecular paradigm of which Skinner would be representative?

At a less profound level, the molar view, from an evolutionary viewpoint, seems to assign a secondary role to behavior, in relation to other evolutionary approaches in which behavior to have a more relevant role in evolution. When the molar view addresses more complex levels, such as the cultural one, its "profound implications" still need to be demonstrated.

If molar behaviorism and multiscale behavior analysis integrate with a gene-centered evolutionary theory, behavior analysis, understood as a part of biology, remains on the surface.

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