

EXPANDING THE BEHAVIOR-ANALYTIC MEANINGS OF “FREEDOM”: THE CONTRIBUTIONS OF ISRAEL GOLDIAMOND

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ABSTRACT: The adoption of determinism and the use of the term “control” when referring to relations of influence between environment and the actions of organisms seem to suggest that there is no room for freedom in behavioral science. Nevertheless, some behavior analysts have articulated meanings of the word “freedom” that are wholly consistent with the epistemological assumptions of radical behaviorism. Some of these meanings, like those elaborated by Skinner, Baum and Catania, are relatively well-known in the behavior-analytical community and had some measure of conceptual or practical impact. In order to expand the possible behavior-analytic meanings of “freedom,” this article aimed to revisit and discuss a unique and little-known formulation on the subject elaborated by Israel Goldiamond. To these ends, we present (a) Goldiamond’s first remarks on freedom; (b) his subsequent proposal of a nonlinear behavior analysis; (c) the concepts of degrees of freedom, degrees of coercion and “genuine choice”; and (d) the types of coercion identified by Goldiamond that ultimately limit freedom in different social contexts. This is followed by a discussion on how and to what extent Goldiamond’s formulation constitutes an expansion of the behavior-analytic meanings of “freedom.” Similarities and differences between Goldiamond’s formulations and those of Skinner, Baum and Catania are also discussed.

KEYWORDS: freedom, coercion, nonlinear behavior analysis, choice, Israel Goldiamond

Since determinism is one of its fundamental assumptions, radical behaviorism is often seen as a philosophy opposed to freedom. Despite eventual disagreements on some aspects involving this adoption of determinism (Laurenti, 2009), it is reasonable to assert that the majority of behavior analysts consider control as inherent to behavioral relations (Dittrich, 2010). The adoption of determinism, as well as the use of the term “control” when referring to relations of influence between the environment and the actions of organisms seem to suggest that there is no room for freedom in behavioral science (Sidman, 1989). Regardless of this apparent contradiction between control and freedom, behavior analysts argue that only specific meanings of freedom are rejected by radical behaviorism, namely those linked to world views that associate freedom with the absence of control, the possession of “free will,” or that assume an independent agent causing behavior (Baum, 2017; Dittrich, 2010; Flor, 2012; Laurenti, 2009; Skinner, 1971).

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The rejection of these meanings of freedom has not eliminated the need for a consistent articulation of the idea of freedom with the epistemological assumptions of radical behaviorism. Perhaps the most influential of these attempts has been B. F. Skinner's, presented in the book *Beyond Freedom and Dignity* (1971). In this book, Skinner comments on the traditional conceptions of freedom—those referring to the absence of control and the existence of “free will”—and argues that, as we identify and characterize the behavioral conditions that control the emission of the word “freedom,” it is possible to develop meanings of freedom consistent with the radical behaviorist philosophy.

Identifying and characterizing the conditions under which the expression “freedom” is used shifts the emphasis from traditional conceptions of freedom to the analysis of contingencies of reinforcement. For Skinner (1971), this analysis indicates that one of the conditions in which the term “freedom” is most commonly used is that where there is no aversive control of behavior, whether by negative reinforcement or punishment. In this sense, the “struggle for freedom is not due to a will to be free, but to certain behavioral processes characteristic of the human organism, the chief effect of which is the avoidance of or escape from so-called “aversive” features of the environment” (Skinner, 1971, p. 46).

Another meaning of “freedom” identified by Skinner (1971) relates to the absence of behavioral control by positive reinforcement in situations with aversive consequences in the medium or long term. A large part of the defenders of freedom—those that make up what Skinner (1971) has called “the literature of freedom”—emphasize the meaning of freedom as the absence of immediate aversive control while ignoring control by positive reinforcement with deferred aversive consequences. Deferred aversiveness and immediate positive reinforcement produce “feelings of freedom,” of “doing what you want,” and reduce the likelihood of countercontrol. Thus, immediate positive reinforcement with deferred aversive consequences tend to give rise to the “happy slave”: the person who, by having its behavior controlled by immediate positive reinforcement, “feels free” and does not identify the sources of aversive control.

Dittrich (2010) and Weber (2005) also argue that Skinner connects the concepts of “self-knowledge,” “self-control” and “countercontrol” with a behavioral meaning of freedom. These three concepts refer to classes of behaviors that increase the likelihood that a person will totally or partially eliminate sources of aversive stimulation (negative reinforcement or punishment), whether immediate or deferred. The better the repertoire of self-knowledge, self-control and countercontrol of a person, the more likely it is that we classify this person as free (Dittrich, 2010). In other words, it is more likely that we classify someone as “free” when we observe the occurrence of these three classes of behavior and the occurrence of the type of consequences that they allow (elimination or reduction of aversive environmental stimuli).

In short, the behavioral conditions that characterize freedom are, for Skinner, those in which there are no contingencies of aversive control, whether negative reinforcement or punishment, immediate or deferred. A review of the behavior-analytic literature reveals that, still today, these formulations by Skinner prevail in works that deal with the relationships between freedom and radical behaviorism (e.g., Abib, 2016; Baum, 2017; Cruz, 2010; Dittrich, 2010; Flor, 2012; Laurenti, 2009; Sidman, 1989). Perhaps by the relevance, pioneering quality and obvious influence of Skinner's works on behavior analysts, the proposal of alternative formulations on the theme of freedom is unusual in the area. Some of the exceptions are discussed below.

Freedom and Choice: Alternatives to Skinner's Formulations

By “alternative formulations” here we do not necessarily mean contrary formulations. They are alternative meanings of freedom that are also consistent with radical behaviorism and complementary to Skinner’s meanings. These formulations are equally critical of the traditional conceptions of freedom mentioned previously and are consistent with Skinner’s meanings of freedom, enabling an expansion of the possible meanings of this term for behavior analysis. Such conceptual refinement could improve the interpretive and interventional abilities of behavior analysts, as well as expand possibilities for dialogue with other areas interested in the theme of freedom.

This is the case for the meanings proposed by authors such as Baum (2017), Catania (1980, 1997) and Goldiamond (1965, 1974/2002, 1975a, 1975b, 1976). The formulations by these three authors have one aspect in common: they relate freedom with the possibility of choice. All three have pointed out that the relation between freedom and the possibility of choice is present both in common sense discourse as well as in academic disciplines, such as Philosophy or the Social Sciences. The recurrence of this meaning of freedom has motivated these authors to identify the behavioral conditions that characterize the “possibility of choice” and subsequently to relate these conditions with the theme of freedom.

In his book *Understanding Behaviorism*, Baum (2017) identifies three recurrent meanings of freedom and proposes a behavior-analytic interpretation of them. He argues that many authors describe freedom as the absence of impediments or coercion (e.g., release from slavery), which, in behavioral terms, is equivalent to Skinner’s meaning of freedom as the absence of immediate aversive consequences. Baum also argues that religious people sometimes speak of another kind of freedom: “spiritual freedom.” The expression refers to the release from a metaphorical (spiritual) prison and the need to exercise detachment from “worldly pleasures” (e.g., sex, food, material goods, etc.). In behavioral terms, Baum argues that the emission of such expressions tend to occur in conditions in which a person has a well-developed repertoire of self-control, which increases sensitivity to the deferred positive reinforcements that tend to follow from practicing a “simpler,” “gentle,” “altruistic” life, etc.

A third meaning of “freedom” identified by Baum—and one of special interest here—is what he calls “political or social freedom”. Freedom, in this sense, would be “having choices” (2017, p. 165) while not being punished for making them. A free person could, for example, choose to participate in different political parties without any of the possible choices causing aversive consequences (e.g., political persecution). For Baum (2017), the possibility of choice means that “more than one activity is possible” (p. 165) and to have freedom it is necessary that all alternative choices are positively reinforced. As Baum (2017) puts it, “we noted that people report happiness when their environment provides choices (alternative possible actions) and those choices have reinforcing consequences rather than aversive consequences” (p. 264). In sum, although the theme of freedom is not central to Baum (2017), since his is a general textbook on behavior analysis, two of the meanings he discusses (spiritual freedom, and political or social freedom) emphasize aspects that were not addressed by Skinner.

Catania (1980, 1997) is another behavior analyst that relates freedom with the possibility of choice. Similar to Baum (2017), Catania states that “choice implies the availability of alternatives” (1980, p. 98). However, after identifying this connection, Catania’s discussion on freedom takes a different path when compared to Baum’s. Catania emphasizes the possibility of experimentally investigating how much organisms (human and non-human) “value freedom”—that is, how much

organisms in general prefer conditions in which there are available alternatives (instead of conditions in which only one alternative is possible).

Catania's emphasis gave rise to a series of experiments in which competing reinforcement schedules were arranged (Catania, 1980, 1997; Rost et al., 2014). Subjects were trained to respond differently to two stimuli: one of them signaling a condition in which there is only one alternative available (e.g., a colored disk) for obtaining reinforcement, thus characterizing a "forced choice," and the other signaling a condition in which there are alternatives available (e.g., more than one colored disk) for reinforcement, thus characterizing a "free choice". When reinforcement parameters remain the same in the forced choice situation and in all the free choice alternatives, it is assumed that preference for one of the conditions is controlled only by the "opportunity to choose" (Rost et al., 2014).

In these experiments, it was found that when the reinforcement parameters in both conditions are the same, or when there is greater reinforcement (in time or magnitude) in the free choice alternatives, subjects in general—humans included—show a preference for the free choice conditions. On the other hand, when the free choice alternatives provide smaller reinforcements (in time or magnitude) than the forced choice condition, choice behavior changes and subjects give up free choice (for experimental details and a comprehensive review of the literature, see Rost et al., 2014).

Israel Goldiamond on Freedom

Both Catania's and Baum's formulations deal with a behavioral meaning of "freedom as possibility of choice," consisting of alternatives to Skinner's formulations, which are recurrent in the behavior-analytic literature. Catania's remarks emphasize the experimental investigation on how much organisms value conditions of freedom. The fact that this formulation originated an experimental research program on the subject (Rost et al., 2014) reveals that, although not often mentioned in non-experimental papers that focus on the relation between freedom and behavior analysis, Catania's research had some impact on the behavior-analytic community. Baum, on the other hand, does not thoroughly explore the nuances of behavioral processes that characterize the "possibility of choice," emphasizing only the absence of aversive consequences in the alternatives presented in situations of choice.

However, a behavior analyst who developed this meaning of "freedom as possibility of choice" in a broad and detailed manner was Israel Goldiamond (1919-1995). In a series of publications, the first of them in 1965 (thus, six years before the publication of *Beyond Freedom and Dignity*), Goldiamond formulates his own meaning of freedom, consistent with his unique way of conducting functional behavior analyses, namely by means of what he called "nonlinear behavior analyses." This conception of functional analysis gave rise to formulations about freedom that are also unique and worthy of separate review. In addition to the "possibility of choice," Goldiamond considers that freedom would also involve the possibility of "genuine choices."

The fact that Goldiamond has published many of his works in non-behavior-analytic journals (e.g., *Arizona Law Review*, *Behavior Disorders: Perspectives and Trends*) contributes to the reality of his ideas remaining little-known or even unknown in the behavior analysis community (Layng, 2009), which also applies to his formulations about freedom. In addition to the fact that Goldiamond has a large number of publications outside behavior analysis, Layng (2009) also identifies that citations from his papers in behavior-analytic journals have declined over the past few years, even with the republication of one of his most important articles (Goldiamond, 1974/2002) in *Behavior and Social Issues*.

In this process, there is a risk that his contributions to behavior analysis could be lost without proper appreciation. Gimenez, Layng, and Andronis (2003) even state that Goldiamond's formulation about freedom is "better articulated and technically more satisfying than the pioneering exploration presented by Skinner" (p. 40), although they do not explore the theme further in this chapter.

The purpose of this article, therefore, is to revisit and discuss the behavior-analytic meaning of "freedom" proposed by Goldiamond, through the review of articles in which he addressed the subject. To that end, the following will be presented: (a) Goldiamond's first remarks on freedom; (b) his proposal of a nonlinear behavior analysis; (c) the concepts of degrees of freedom, degrees of coercion and "genuine choice"; and finally, (d) the types of coercion identified by Goldiamond that ultimately limit freedom in different social contexts. Finally, we discuss how and to what extent Goldiamond's formulation constitutes an expansion of the behavior-analytic meanings of freedom, indicating its differences and similarities with Skinner's, Baum's and Catania's formulations.

Outlining a Behavior-Analytic Meaning of "Freedom"

Goldiamond's first remarks on the meaning of freedom for behavior analysis appear in an article published in 1965. In this article, the author states that the term "freedom" is "often equated to the absence of control," and that one of the implications of this point of view is that an efficient operant psychology would be "dictatorial" (1965, p. 251), as it advocates for the exercise of control. However, consistently with behavior-analytic principles, the notion of freedom as the absence of control is readily criticized by Goldiamond (1965):

Closer examination, however, reveals that freedom may not be synonymous with sloppiness. The child who responds, "In just a minute, Daddy," when called to brush his teeth, may not be more free than one who responds immediately. He may be watching a television show whose reinforcements are controlling watching behavior. His behavior may be under effective environmental control. Fundamentally, the subject at issue between obeying the paternal command and not obeying it may not even be one of sloppy control versus good control but rather one of whose control is involved. In this sense, freedom is an irrelevant term, as it is in the case of freedom from physics laws. (p. 251)

Once the absence of control as a meaning of freedom for behavior analysis is discarded, the need for identification of a meaning that is consistent with its assumptions arises. To this end, the alternative chosen by Goldiamond (1965) to deal with this issue was to use a strategy similar to Skinner's (1945/1984, 1957) for identifying the "meaning" of words in general. Skinner (1957) argues that the meaning of a word is a property of the conditions under which its emission occurs. That is, in order to identify the meanings of a term such as "freedom," the identification and characterization of the behavioral conditions that control its emission are necessary.

Thus, Goldiamond proposes the development of a satisfactory answer to the following question: "Given two people, one of whom we agree has more freedom than the other, what are the behaviors and conditions which differentiate them?" (1965, p. 251). This is the question that guides his initial argument about the meanings of freedom.² The answer to this question, in his 1965

² The use of such question is an example of the procedure used by Goldiamond (1965) to identify the meaning of terms and expressions, which was referred by him as The Basic Behavioral Question. This procedure is defined and

article, may be considered limited (there are only three paragraphs about freedom throughout the text) when compared to the conception of freedom developed by the author in later years (in papers that we analyze below). Even so, these passages already suggest the direction that his treatment of the meaning of freedom would take from then on:

A person who is ‘compelled’ does not have many response alternatives available to him during the conditions of his compulsion. We may be able to alter his behaviors, so that when the hither to compelling conditions are now presented, a variety of responses may occur, that is, more response alternatives are available. [...] [W]e define freedom in terms of the number of response alternatives available [...] A person who is more free than other may have more types of alternative consequences contingent upon his differing behaviors and may, therefore, have more response alternatives than the other person. (Goldiamond, 1965, pp. 251-252)

Thus freedom to Goldiamond (1965) is, at first, the availability of alternative responses. The initial focus of Goldiamond's considerations is on the behavioral repertoire: the richer the behavioral alternatives to deal effectively with his environment are, the freer a person is. Despite the mention of the availability of “contingent alternative consequences” as part of the definition of freedom, this aspect receives little attention in the rest of the article.

Other aspects of this initial consideration about freedom made by Goldiamond (1965) should be emphasized. The first one is that the way in which the author constructs the question that guide his initial formulation, as well as the answer he gives to it, suggests that freedom and coercion are not absolute statuses. One person can be *freer* than another or may be *more* subject to coercion than another. Greater or lesser freedom would depend on the amount of alternative responses available. Using a distinction presented by Widerquist (2013), it is possible to say that Goldiamond emphasizes a scalar conception of freedom (e.g., “John is more free than Paul,” “Paul is less free than John”), rather than a conception of freedom as an absolute status (e.g., “John is free,” “John is not free”).

A second point highlighted in the text is that increasing freedom implies, for Goldiamond (1965), a reduction of coercive conditions. Since it is a scalar concept, freedom does not necessarily equate to the absence of coercion, but rather to a reduction of coercive conditions through the increase of available alternative responses. Thus, it is clear that a satisfactory behavior-analytic definition of “freedom” also depends on the definition of the term “coercion.” In short, what characterizes coercion to Goldiamond (1965) in this first moment is a limited (or nonexistent) amount of alternative responses available in order to deal with aversive conditions.

These are the two aspects that constitute, for Goldiamond, the basis on which a behavior-analytic meaning of freedom may be defined. In subsequent works (1974/2002, 1975a, 1975b, 1976, 1984) these two aspects—the scalar nature of freedom and coercion, and the emphasis on the availability of alternative responses—are reviewed and revised in detail, thus resulting in a more synthetic formulation that, according to the author, corresponds to an everyday use of the term in question: “freedom will be defined in terms of the genuine choices available” (Goldiamond, 1976, p. 22).

illustrated as follows: “The scientist may define ‘mother love’ operationally as the number of kisses a mother gives a child. The Basic Behavioral Question asks: ‘When people use the term ‘mother love’, what behaviors of the mother are they talking about and what are the conditions under which these behaviors must occur for them to use this term?’ The attempt is made to have contact with the usage of the term by the social community.” (Goldiamond, 1965, p. 249).

When Goldiamond defines freedom as the availability of genuine choices, his effort turns to the description of the conditions and behaviors that allow and justify the use of such a definition. The strategy for identification and characterization of the meanings of expressions remains the same as in the 1965 article. An important feature of this new definition is the reference to the term “choice,” which demands the description of the conditions that allow the use of that word. This in turn will permit the identification of the conditions that renders a choice “genuine,” as well as the description of the relationships between “genuine choice” and freedom.

Choice and Nonlinear Behavior Analysis

In order to identify whether or not there is a condition of choice it is necessary to examine the set of behavioral alternatives available in a given situation (Goldiamond, 1975a). A well-defined behavioral alternative might be to work at a mine and receive money as a consequence. In a situation in which there is no choice, alternatives to work at the mine are not available or are not formally defined—or else, they can be loosely described as “doing anything else” or simply “staying unemployed.” To be able to say that there is a choice at least two well-defined behavioral alternatives are necessary. That is, if in addition to working at the mine there are other alternatives, such as working at a farm, a factory, etc., a condition that is typically called a choice is established (Goldiamond, 1975a).

In Goldiamond’s conception, a proper analysis of choice behavior (e.g., “working at the mine” when there is the alternative of “working at the farm”) requires the execution of what he calls *nonlinear behavior analyses* (1974/2002, 1975b, 1976, 1984). For the author, functional analyses of behavior are more often characterized by a descriptive linear logic. In this logic, behavior is functionally described by the contingent relation between a response and its antecedent and consequent stimulus. Thus, the analysis of behavioral instances is treated “mainly in the context of an algebra of *intra-contingency variables* (such as instructional stimuli, reinforcement schedules, motivational variables, and so on)” (Gimenez et al., 2003, p. 36).

On the other hand, a nonlinear behavior analysis considers the response under investigation as a function of multiple concurrent contingencies (Goldiamond, 1975b; Layng, 2009). This is a descriptive model that takes into account not only the antecedent and consequent stimuli of the specific response under investigation, but also the antecedent and consequent stimuli of alternative patterns of response present in an individual’s repertoire. In order to provide an analysis of choice and the conditions under which it occurs, a nonlinear behavior analysis would be appropriate as it provides a description of the behavioral flow based on an analysis of relationships *between contingencies*. As argued by Gimenez et al. (2003), a nonlinear behavior analysis seeks to explain “both concurrent contingencies and the dynamic interaction between their defining variables in the course of time” (p. 36).

Thus, choice behavior is analyzed as a function not only “of the occasions and consequences (and their histories) that immediately circumscribe it, but also of the occasions and consequences of alternative patterns (and their histories)” (Gimenez et al., 2003, p. 308). The procedures suggested by Goldiamond (1975a, 1976, 1984) as necessary for an understanding of why an alternative is preferred over another are: (a) to identify the set alternative contingencies that comprise the situation of choice; (b) to analyze the responses costs and the consequential benefits of all the alternative behavioral patterns. In a nonlinear behavior analysis, the choice of “working at the mine,” for example, is understood not only as a function of the antecedent and consequent stimuli (e.g., reinforcing value) and the response cost related to this behavioral pattern, but also as

a function of the antecedent and consequent stimuli and the response cost related to alternative behavioral patterns (e.g., “working at the farm”).³

Degrees of Freedom and Coercion

When Goldiamond relates freedom with the availability of choices his arguments take as a backdrop the notion of a nonlinear behavior analysis. Goldiamond (1975b, 1976) also borrows from physics the concept of *degrees of freedom* (df), in order to better characterize the behavioral conditions of choice. In that field of knowledge, this concept is commonly used to refer to the amount of independent variables that can be specified and that determine a system. The example given by Goldiamond (1976) to illustrate how the concept can be used refers to the calculation formula of the volume of a cube: $V = l.w.h$, where V is the volume, l is the length, w is the width and h is the height. Three of the values in this formula can vary independently and, when specified, allow the determination of the fourth value, which determines the system being analyzed (e.g., $l.w.h$ determines the value of V , as well as $V.w.h$ determines the value of l). Therefore, in this example, $df = 3$, since the complete determination of the system depends on the specification of three variables (Goldiamond, 1976).

When applied to the nonlinear behavior analysis of choice, the concept of degrees of freedom specifies the number of behavioral alternatives that compose a given situation. If in a given social context working at the mine is the only alternative that allows access to a critical consequence (e.g., survival)—otherwise one would simply “starve”—then $df = 0$ in relation to available jobs. There are no degrees of freedom and, as a result, it is possible to say that working at the mine was not a free choice. If, however, there are the options of working at a farm or at an industry in addition to working at the mine, then $df = 2$. In the latter case, only one class of behavior is emitted (i.e., “chosen”), such as “working at the mine,” but the availability of two alternatives sets a higher degree of freedom. In sum, n different contingencies *minus one* define the degree of behavioral freedom in a given condition of choice. In the context of this hypothetical labor market, according to Goldiamond (1976), it is more likely that workers will feel more independent, and the abuse by employers who control the access to critical reinforcers becomes less likely.

For Goldiamond, using the concept of degrees of freedom is justified because it “not only suggests that freedom is a matter of degrees, but also implies that coercion ... is also a matter of degrees” (Goldiamond, 1976, p. 22). Assuming that survival is a critical consequence and access to it is made contingent only to one response class, such as working at the mine (i.e., either a person works at the mine or “dies of starvation”), the *degree of coercion* (dc)⁴ is maximal. Thus, when $df = 0$, dc value is maximal. In the context of a labor market used as an example, “where there was a choice between mine, mill, factory, and farm, coercion was lower since df had a higher value” (Goldiamond, 1976, p. 22). We have, then, a relationship of inverse proportion: the greater the number of behavioral alternatives, the greater is the degree of freedom and, therefore, the lower is the degree of coercion.

The transposition of the concept of “degrees of freedom” from physics to a nonlinear behavior analysis of choice and the subsequent proposition of the concept of degrees of coercion characterizes the way Goldiamond relates a greater number of choice possibilities with the consideration of

³ An extended presentation of the notion of nonlinear behavior analysis can be found in Goldiamond (1975b, 1984).

⁴ Differently from the concept of “degrees of freedom,” the concept of “degrees of coercion” is not taken from physics. In this case, its use is merely figurative (Goldiamond, 1976).

a person as “freer”. The concern in specifying the degrees of freedom and coercion also shows the scalar nature of the meanings of “freedom” and “coercion,” which was already present in Goldiamond’s (1965) initial formulation.

Freedom as the “Availability of Genuine Choices”

We described the behavioral conditions that define “choice,” as well as how Goldiamond performs his nonlinear analysis. Choices were then characterized by the degrees of freedom and coercion that they present. However, Goldiamond's definition of freedom involves not only the possibility of choices, but also the availability of *genuine choices*.

This is a conceptual refinement made by Goldiamond in relation to the 1965 formulation. If the meaning of freedom was previously defined simply “in terms of the genuine choices available” (Goldiamond, 1965, p. 251)—emphasizing the behavioral alternatives—now Goldiamond (1975a) argues that, in order for a choice to be considered genuine, what has been called behavioral alternatives need, necessarily, to denote the availability of *alternative contingencies that are equally possible*.

It is not enough that the behavioral repertoire of a person enables him to work at a mine (i.e., that the person has mining skills) if there are no mines or job opportunities for working at mines in that context. In this case, working at the mine is not a genuine behavioral alternative, because there is no possibility of establishing a contingency relationship between a response class (e.g., mining) and *opportunities* in the social environment that would guarantee access to critical consequences (e.g., survival). Inversely, it is possible to imagine situations in which there is an abundance of *opportunities* of employment (e.g., mine, farm, factory, etc.), but a person does not have the necessary skills to fill any of the vacancies or is not aware of the existence of such vacancies. In this case, contingency relations are also not established—this time however due to a deficit in the behavioral repertoire of the person in question.

As Goldiamond puts it (1975a), “freedom requires that the alternative contingencies be equally possible” (p. 124), and only to the extent that these are in fact equally possible “increase in degrees of freedom may be defined” (p. 123). It is in this sense that Goldiamond (1965) states that a person who had access to a good school education and, consequently, has greater access to alternatives of paid work, “is freer than someone who can only dig ditches for a living” (p. 252). In order to summarize the importance of a behavioral understanding of genuine choice and its relationship with the meaning of “freedom” Goldiamond (1976) argues:

Failure to distinguish genuine choice from simple availability of alternatives, no matter how well their availability is made known in an informed consent procedure, is reminiscent of Anatole France's statement on the impartiality of the law which “in its majestic equality forbids the rich as well as the poor to sleep on the bridges, to beg on the streets, and to steal bread”. (p. 23)

Genuine Choices and Critical Consequences

Still, Goldiamond (1976) highlights that the availability of alternative contingencies—i.e., the existence of a behavioral repertoire plus the existence of opportunities necessary for its occurrence—is not enough to characterize a choice as genuine. The possibility of genuine choices also requires that *critical consequences* are available for different behavioral patterns. Critical consequences, according to Goldiamond (1976), are those that when made contingent to any particular

behavior generally have a powerful control over it, showing high reinforcement value when added (e.g., food for the starving) or when removed (e.g., electric shock of high intensity). In other words, they are consequences that, given certain conditions or operations, are preferred in all choice situations.

In some cases, depending on a number of conditions, certain consequences become more critical than others (Goldiamond, 1974/2002; 1976). In laboratory settings, for an example, it is possible to reinforce an organism with two different consequences, keep the response cost and other variables constant and then check which of the consequences will be produced with greater frequency (i.e., the one that will be “preferred” by the organism). The preference for a consequence over the other can not only be measured but manipulated in a laboratory. One of the alternatives to manipulate the value of certain consequences is the control of the degree of deprivation. An organism with appropriate body weight and satiated tends to prefer opportunities to exercise rather than opportunities to eat (Goldiamond, 1976). However, the experimenter can deprive the organism of food, reducing its body weight by 30 or 40%, thus ensuring that “food,” now a powerful positive reinforcer, will be a critical consequence.

The value of a certain consequence—or to what extent the consequence is indeed critical—is an essential aspect of the meaning of coercion proposed by Goldiamond. Consequently, analysis of how critical are the consequences of different behavioral patterns (that make up a situation of choice) is necessary to conceptualize a meaning of “freedom.” In a previous example, a hypothetical labor market was described in which “survival” (i.e., access to essential resources), a critical consequence, was made contingent to only one class of responses (working at a mine). For Goldiamond, situations such as this constitute severe coercion, since there are no choices ($df = 0$) and the consequence contingent on the response class is critical (1975a).

In the above example the degree of behavioral freedom in relation to job choices would be greater if there were alternative contingency relations for working at a farm or factory (therefore, $df = 2$), which would provide access to essential resources for survival. However, Goldiamond (1976) claims that a condition like this can still be considered coercive, for even if there are alternatives of wage labor ($df > 0$) in a labor market, they are the only choices that provide access to the critical consequence in question, with no alternative means of survival other than the market. The control of the behavior of the worker by the employers, in this example, is possible due to the lack of access to essential resources, which makes survival a critical consequence for workers. At this point, Goldiamond (1976) acknowledges that, even though it is possible to describe conditions and behaviors that characterize coercion and freedom, there is an important ethical dimension in the definition of those terms, rendering a strict scientific description insufficient. This dimension concerns the “degrees and type of coercion we tolerate, and what safeguards against abuse these require” (Goldiamond, 1976, p. 25), given the difficulty of conceiving a world fully free from coercion.

A situation similar to the example of the labor market is the coercive use of token economies in custodial or mental health institutions—a procedure based on principles derived from the experimental analysis of behavior which was commonly used in the United States during the 1960s and 1970s (Wexler, 1973; Goldiamond, 1974/2002). Goldiamond himself (1974/2002) reports a visit he made to a psychiatric institution that used tokens as conditioned reinforcers, established through the deprivation of access to bed, forcing patients to sleep on a cold floor. Access to the bed was made a critical consequence, since only such access made possible to avoid contact with the aversive cold floor during the nights. The staff required the emission of certain behavioral patterns so that patients received tokens which could be exchanged for access to the beds. In this

case, even if there are alternative contingencies available to earn the tokens ($df > 0$) the institutional practice can be considered coercive, since it makes the access to a critical consequence (beds) contingent to certain behaviors defined by the institution. As Goldiamond (1975b) states:

The issue is one of coercion. It can be argued that positive reinforcement is used coercively when the controlling system makes a potent consequence contingent only on the TB (target behavior) it requires, and especially so when it also creates the conditions which make the consequence potent. A system which creates some critical state of need, such as famine (or doesn't create it, but takes advantage of it), and then makes food delivery contingent only on the specified behavior repertoire it desires, leaving the recipient with the choice of starving or acceding, can certainly be called coercive. (p. 61)

This applies both to experimental situations in laboratories—in which non-human animals are deprived of food or water—as well as to the examples of labor market and mental health institutions that use the token economy. The passage above also points to a distinction between systems that create critical situations of need and those that do not create but take advantage of them.

Institutionally Instigated Coercion and Institutionally Opportune Coercion

In order to conclude Goldiamond's characterization of the meaning of coercion we present now two specific types of coercion that he identifies: institutionally instigated coercion and institutionally opportune coercion. Institutionally instigated coercion is the one in which the institution arranges the set of contingencies that provides access to critical consequences and also establishes the conditions that make the consequences critical (Goldiamond, 1976). An example is the use of non-human animals in behavior analysis research. The experimenters themselves establish the behaviors to be reinforced and the conditions that make access to water or food critical consequences (i.e., through deprivation). As Goldiamond argues, if “deprived pigeons could consent, and were required to do so, before undertaking the training program which is their only means of obtaining food, such consent could be considered as having been obtained under severe coercion, rendered all the more severe by the fact that it was the experimental system itself which made potent the reinforcer it provides” (1976, p. 24).

Goldiamond (1976) provides other examples in addition to the laboratorial experiments with non-human animals. When prisons establish that prisoners “willing to participate” in biomedical research projects shall have access to early parole (critical consequence) this is also a case of institutionally instigated coercion. In this case, the penal system itself, which has the power to deprive someone of freedom, also has the power to use the “restitution of freedom” to make prisoners behave in ways defined by the institution.

In the context of this example it is important to differentiate critical consequences from those that are entirely program-specific—or, as Goldiamond (1974/2002) puts it, those that occur as a direct result of the contingency. An early parole may be the critical consequence that governs prisoner participation in a biomedical research instituted by the penal system. Direct contact with (or being informed about) non-therapeutic “side effects” during the process of an experimental treatment would be among the program-specific consequences. If there is at least one degree of freedom (i.e., there are at least two ways to get an earlier parole), the program-specific consequences will have a greater chance of govern the contingency and, by doing so, define a more genuine choice—where side effects of an experimental treatment may enter into, and may influence the choice. In sum, equivalence of critical consequences across alternatives allows program-

specific consequences across alternatives to have an effect—thus resulting in more genuine choices.

Other examples of institutionally instigated coercion are the use of torture methods, in which the relief of pain afflicted by institutional agents is made contingent on behaviors imposed by the system (e.g., confessions, delivery of information, etc.), and situations in which a company artificially produces shortages of some key product of which it holds a monopoly and then profits from it.

Institutionally opportune coercion, on the other hand, is the one in which the institution arranges the set of contingencies that provide access to critical consequences but it does not by itself have the means to make certain consequences critical (Goldiamond, 1976). In this case the institution only takes advantage of the opportunity afforded by the “state of things,” whether natural or human-made. The examples presented by the author come from the “helping professions” in general, especially medical institutions (Goldiamond, 1976). In these cases, patients must undergo certain forms of treatment and behave according to the institutional prescriptions in order to have access to critical consequences (e.g., pain relief, cure, etc.). When $df = 0$ and the consequences are critical there is a severe situation of coercion that “is not lessened by the fact that it was not institutionally instigated, nor is it lessened by its social prevalence, inevitability, or desirability” (Goldiamond, 1976, p. 26).

Examples such as this emphasize again the ethical dimensions of the discussion about coercion. Institutionally opportune coercion provides the possibility of establishing socially desirable or acceptable practices, but also creates opportunities for establishing abusive practices. A medical institution that holds a monopoly on some specific treatment may, for example, stipulate abusive prices for access to critical consequences. In such cases, according to Goldiamond (1976), society needs to define the degrees and types of coercion that it is willing to accept and to create protections against abuse (e.g., breaking up monopolies, creating oversight bodies, etc.).

The labor market can also be characterized as an institutionally opportune system of coercion. Employers may stipulate the behaviors required for access to critical consequences by workers under various deprivation conditions. The deprivation conditions are not necessarily instigated by the employers themselves. Examples of abuse arising from this type of coercion were especially common throughout the 19th century (Polanyi, 2001; Steinfeld, 2001), during the process of consolidating wage labor in capitalist societies. Throughout history, a number of collective actions were required to mitigate these abuses (e.g. the creation and consolidation of trade unions, labor laws, etc.).

Conclusion

For Goldiamond, the possibility of making genuine choices constitute an adequate behavior-analytic meaning of freedom. In order for a choice to be considered genuine there must be a set of alternative contingencies that provide access to critical consequences. The greater the number of alternative contingencies available in a given condition, the greater is the degree of behavioral freedom of choice. As summarized by Goldiamond himself:

Genuine choices involve such options when contingency repertoires are equal. Equality of contingency repertoires requires equally available opportunities or occasions, equally available patterns of behavior, equally potent consequences, and since they are contingency repertoires and repertoires require establishment over time, equally functional contingency histories. (1976, p. 38)

The degree of behavioral coercion is also defined by the number of alternative contingencies available, but inversely to the degree of behavioral freedom: the smaller the number of alternative contingencies available, the greater the coercion. For Goldiamond, coercion is characterized by how critical are the consequences that control the choice behaviors and also by the types of conditions that make certain consequences critical (institutionally instigated or institutionally opportune). Insofar as degrees of behavioral freedom and coercion are identified and characterized it becomes possible to say that a person is more or less free than another (or is more or less subject to coercion than another). Thus, for Goldiamond, this meaning of coercion cannot simply be reduced to the identification of the presence of aversive control—a practice commonly found in the literature of the area, as Hunziker (2017) indicates.

The distinction between institutionally instigated coercion and institutionally opportune coercion allows for a behavior-analytic interpretation of the power relations present in several social contexts. These concepts allow for a better characterization of situations in which individuals or groups that have power over essential resources (controllers) arrange the sets of contingencies that allow other individuals or groups (controlled) access to such resources (critical consequences). In the specific case of institutionally instigated coercion it becomes possible to identify and characterize situations in which controllers are also in a position to render certain consequences critical. It is worth noting that the notion of critical consequences can be related to the concept of motivational operations (Michael, 1982). A detailed investigation of the theoretical and practical implications of this relation can bring relevant contributions to the discussion on the behavioral meanings of freedom and coercion.

Goldiamond's emphasis on the identification and characterization of the set of alternative contingencies that comprise a context is justified by its use of nonlinear behavior analysis. While Skinner's formulations about freedom are marked by linear analysis which emphasizes the temporal nature of the aversive consequences (immediate or deferred), a nonlinear behavior analysis helps the behavior analyst to discriminate the availability or unavailability of alternative contingencies in the immediate context.

However, this does not mean that Goldiamond's formulations about freedom are "better articulated or technically more satisfactory" than those of Skinner, as suggested by Gimenez et al. (2003). The relationships pointed out by Skinner between his proposed meaning of freedom and the concepts of "self-control," "self-knowledge" and "countercontrol" may also be interpreted in the light of Goldiamond's formulations. An expansion of the repertoires of self-control, self-knowledge and countercontrol provides individuals with alternatives of access to opportunities (antecedents) and critical consequences (powerful reinforcers) in their social environment. The formulations of Skinner and Goldiamond about freedom may complement each other, thus expanding the behavior-analytic meanings of freedom.

As we noted, Baum's (2017) and Catania's (1980) formulations about freedom are similar to Goldiamond's. However, even if the three authors treat freedom as possibility of choice their analyses differ in scope or emphasis. Goldiamond's formulations are not restricted to an analysis of the availability of behavioral alternatives without aversive consequences, which is emphasized by Baum (2017). For Goldiamond, coercion may exist even in situations where there is a set of alternative contingencies that allow access to critical consequences, which are characterized as positive reinforcers. This is the case in the labor market which, even if providing different job opportunities (i.e., greater degree of behavioral freedom) offers no alternative of survival besides wage labor.

The individual may choose his employer, but cannot choose “not to work.”⁵ The same occurs in the prisons and mental health institutions described by Goldiamond. In those institutions, even if there are different ways of getting tokens (conditioned positive reinforcers) inmates or patients have no other means of getting access to beds.

On the other hand, the experiments of Catania (1980, 1997) and Rost et al. (2014) reveal that organisms (human and non-human) prefer situations of forced choice rather than those of free choice when the former provides greater reinforcers. In other words, organisms give up the “opportunity to choose” in favor of a condition of forced choice when the consequences available in this condition have high reinforcing value. This is an experimental finding that complements Goldiamond’s considerations about the importance of assessing not only the degree of behavioral freedom of choice, but how critical certain consequences are for an organism. In this sense, the difference in scope and emphasis of Goldiamond’s analysis—in comparison to those of Baum (2017) and Catania (1980, 1997)—may be characterized as an even more specific expansion of the behavior analytic meanings of freedom, namely those that deal with the relationship between freedom and possibility of choice.

In practical terms, this conceptual expansion enables new dialogues with other areas of knowledge that deal directly or indirectly with the subject of freedom (e.g., political philosophy, economics, sociology, anthropology, etc.). Additionally, a behavioral analyst may act in different contexts in order to promote an expansion of the degrees of behavioral freedom and the possibilities of genuine choices. This may occur, for example, in the practice of psychotherapy, insofar as the behavior analyst assists in the expansion of behavioral repertoires, thus facilitating the emergence of alternative contingencies.⁶ In this case, it can be said, metaphorically, that the therapist enables an extension of the “horizon of possibilities” of his patient.

The behavior analyst may also assist in the design of public policies, in order to enable certain vulnerable groups to have new opportunities that, in turn, can ensure access to critical consequences. Regarding such possible practical implications, Goldiamond (1965) claims that his formulations on freedom are not “incompatible with control of behavior and, by alerting us to the sources of reinforcement in a community, may alert us how to program our environment to maintain and even to extend freedom; it may make us effective as well as well-meaning” (p. 252).

Finally, even though it is possible to propose meanings of “freedom” and “coercion” consistent with behavior-analytic assumptions, Goldiamond also makes it clear that these concepts have an important ethical-political dimension. The behavioral analyst may identify and characterize the degrees of behavioral coercion and freedom in a given social context and may even, through this technical reading of the context, promote ways of expanding the degrees of freedom of certain individuals or groups. However, he cannot stipulate by himself the types and degrees of coercion that we, as a society, will be willing to accept. Moreover, he cannot stipulate the degrees of freedom that we, as a society, will be willing to consider fundamental. Ultimately, decisions about the types and degrees of freedom that are considered fundamental in a society are an outcome of

⁵ Of course the availability of different employers does not guarantee, by itself, that a person will be employed by any of them. On the other hand, given certain conditions, a person may choose other alternatives that allow access to essential resources (e.g., seeking social assistance or even theft or begging). Assessing how genuine a choice is depends on conducting a detailed analysis of the contingencies in question.

⁶ For further explorations on this argument see Goldiamond (1974/2002; 1984).

political disputes. Such disputes occur not only between the actors and organizations of institutional or partisan politics, but also between corporations, social movements, activists, etc. It is up to the behavioral analyst to elucidate the contingencies at stake in these disputes as well as to intervene, when appropriate, on such contingencies in a politically and ethically oriented manner.

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