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The Completeness of Systems and the Behavioral Repertoire

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It is argued that behavior analysis is an actual or potential axiomatic system based upon the schedules of reinforcement which are behavioral, causative laws. Gödel proved that all axiomatic systems are complete or consistent, but not both at the same time. The point is made that behavior analysis is an incomplete, consistent system. The system's incompleteness is compensated for by the concept of the behavioral repertoire which, although in part lying outside of the axiomatic core of behavior analysis, both extends and strengthens it.

A system of explanation is designed to increase the probability of an individual believing that the world works the way the system says that it does. That is, a belief in the system requires a belief in its ontological validity. Examining the predictive successes of a system is relatively straight forward — the specific predictions are correct or they are not. Difficulty arises when the system's tenets are also considered the basis for interpretive, that is, not immediately demonstrable, explanation which may or may not lead to specific predictions. An example of such an interpretation is Skinner's (1957) use of the predictive principles of behavior and consequence inherent in the schedules of reinforcement, as the basis for explaining the acquisition and use of verbal behavior. His explanation of verbal behavior is interpretive rather than predictive since it is not based directly on experiments involving the acquisition of language in human beings, but rather on the general principles of response acquisition.

Behavioral analysis is perhaps the only remaining psychological system that purports to explain behavior as apparently divergent as that of a simple

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bar press by a rat, and that as complex as human verbal behavior, by the same principles. In addition, the principles of behavior have been used to successfully solve some problems within clinical psychology, education and more recently, industrial organizations (e.g., Anderson, Crowell, Hantula, and Siroky, 1988). These developments make this system a suitable candidate for the analysis which follows.

Assessing the validity or usefulness of an interpretive, explanatory system must eventually address its basic, usually unexamined, assumptions. Of course, even hypothetico–deductive predictive systems are based upon limiting assumptions, but the immediate usefulness of such systems allows for an initial laxity in stating them. Interpretive systems require assumptive analyses from the start. Considering that behavior analysis is, in part, an interpretive enterprise, particularly involving verbal behavior, a careful look at its structure is warranted. Also, because behavior analysis is principally an effort to predict human behavior, the behavior of the predictor, i.e., the behavior analyst, is part of the subject matter of the system. This, of course, is a peculiarity of psychological systems of prediction rather than of systems that address themselves to other animals or to inanimate objects. It is to the credit of behavior analysts that they are particularly sensitive to the basic assumptions of their system. Even though he was not particularly cognizant or appreciative of Skinner's behavior analysis (Richelle, 1993), I have found it helpful to take seriously Jean Piaget's conception of the way that psychological systems develop. I would briefly like to examine Gödel's influence on Piaget and how that might be relevant to the epistemological nature of behavior analysis.

Gödel and Piaget

A good part of Piaget's (1971) conception of intellectual development depends upon the model that derives from mathematical group theory and, more particularly, from Gödel's (1931) conception of the power of the axiomatic method. Piaget believed that Gödel's work provided a conceptual foundation for the general nature of psychological theory by delineating the limitations and possibilities of its structure. Gödel (see Nagel and Newman, 1958) proved that it is impossible to establish the internal logical consistency of a very large class of deductive systems, particularly elementary arithmetic, unless one adopts very complex principles of reasoning so that the internal consistency of these principles is as open to doubt as the systems themselves. Through an ingenious system of numbering, Gödel (after Nagel and Newman, 1958) showed that an arithmetical formula "G" could be constructed that represents the meta-mathematical statement, "the formula 'G' is not demonstrable." He also showed that "G" is demonstrable if and only if its formal negation "not G" is demonstrable. If a formula and its negation are both formally demonstrable, the arithmetical calculus in which they are embedded is not consistent. If the calculus is consistent, neither "G" nor "not G" is formally derivable from the axioms of arithmetic. Therefore, if arithmetic is consistent, "G" is a formally undecidable formula. Gödel also proved that although "G" is not formally demonstrable, it is nevertheless a true arithmetical formula. Hence since "G" is both true and formally undecidable, the axioms of arithmetic are incomplete. That is, we cannot decide all arithmetical truths from the axioms of arithmetic. Gödel established that arithmetic is essentially incomplete because even if additional axioms were assumed, so that the true formula "C" could be formally derived from the augmented set of axioms, another true, but formally undecided formula could be constructed. Gödel then described how to construct an arithmetical formula "A" that represents the meta-mathematical statement, "If A then G is formally demonstrable." Finally, he showed that formula "A" is not demonstrable. From this it follows that the consistency of arithmetic cannot be established by reasoning that can be represented in the arithmetical calculus.

On the reasonably safe assumption that all inferential scientific systems involve deduction, Gödel's proof is of value in understanding the formal nature of theorizing in psychology. Deduction is always involved in scientific thinking and is characterized by a set of principles (e.g., the syllogism) that is axiomatic in nature. Certain axioms of method are assumed in the very process of inference itself particularly as it involves the idea of causation. Gödel's proof does not exclude meta-mathematical proof of the consistency of arithmetic, it simply means that this proof cannot be mirrored by the formal deductions of arithmetic. It is also true that the proof or demonstration of the validity of the structure of a scientific system (its form, not its content) cannot be demonstrated by terms contained within the system itself. Terms outside of both the formal and empirical structures of that system must be used to accomplish that task as, for example, when certain principles of logic are used to demonstrate the validity of a conclusion made within a predictive system. That is, any psychological system of explanation, that takes the highly desirable axiomatic form, must use human processes that cannot be part of that which is explained by the system. This argument, of course, refers to the formal properties of an axiomatic system and not its pragmatic character. Behavior analysts have emphasized the latter characteristic as central to their system. My contention is that the work done on schedules of reinforcement throughout the last several years resulting in the discovery of fixed and variable ratio and interval reinforcement patterns can lead to the formation of axiomatic laws of invariant behavior and consequence. Schedules of reinforcement developed over the past 50 years provide us with the basis for developing such laws. An early collection of these generalized predictions is, of course, presented in Ferster and Skinner's (1957) *Schedules of Reinforcement*. Thirteen schedules are listed by the authors, although there are four basic types: (a) fixed ratio, (b) variable ratio, (c) fixed interval, and (d) variable interval. If these laws are the core of the theory of behavior analysis then the system has an axiomatic character.

The fixed ratio schedule consists of a reinforcement appearing upon the completion of a fixed number of responses made by the organism. The variable ratio schedule requires that a response be reinforced according to a random series of ratios, the mean of which is set by the experimenter. Fixed interval reinforcement is one in which the responses are reinforced at a given time interval. In the variable interval schedule, responses are reinforced according to a series of random time intervals with a preset mean. Over a number of years, many experiments have been performed where pecking in pigeons and bar pressing in rats were studied to determine development and change in these responses. The result was a series of two-dimensional functional curves that describe this activity. An experiment begins with the animal being continuously reinforced. After the rate of responding has stabilized, the fixed ratio is introduced and rate of responding increases over time to a maximum. Should the fixed ratio be either increased or lowered, the resulting functional relationship between rate of responding and that ratio will have a proportional value to the previous ratio. That is, if a ratio is changed and then changed again, the rate of responding will generate three different curves. Because these three functions are predictably related to one another quantitatively, prediction of an animal's behavior under any one of the fixed ratios can be said to be causal and, therefore, part of an axiomatic system, because of the relationship among the empirically determined functions. If only one fixed ratio resulted in the ability to predict the reinforcement–behavior sequence, and no other ratios allowed for consistent prediction, we would suspect the causal efficacy of the one ratio that did work. Our expectation that fixed ratio schedules of reinforcement affect behavior would not be increased. Instead we might suspect that the one fixed ratio that allowed for successful prediction was an anomaly or described merely contiguous events that required further study. In addition, the fixed ratio functions can be shown to be related quantitatively to fixed interval functions. The time it takes an animal to respond in the fixed ratio situation is directly related to time as a significant condition in the fixed interval reinforcement procedure that has generated its own empirical functions.

Consequently there are two quantitative relationships existing within the conclusions drawn by behavior analysis: the quantitative relations of responses within one of the reinforcement types (e.g., fixed ratio 2 and fixed ratio 4) and between the reinforcement types (e.g., fixed ratio and fixed interval). These results meet the definition of causality and, therefore, suggest the possibility for axiomatization. The effect on responses of the schedules of reinforcement add an increment of belief that this sequence of behavior and consequence demonstrated by the schedules is not merely a set of contiguous observations, but is something beyond that in that knowing the way the schedules work changes the behavior of the behavior analyst (his or her belief) regarding the efficacy of the prediction and therefore also in the causal principle and axiomatic structure underlying it.

The Axiomatic System

Piaget was, of course, a structural theorist and, therefore, not at ease with the behavior analytic viewpoint. However, I would like to discuss the outlines of his system and show how it might be relevant to some of the conceptions of the behavior analytic position. Piaget was inspired by Gödel's discovery to conceive of psychological structure as a system of transformations similar to those found in modern mathematics. Piaget believed that the structure of the components of human cognition is constantly building upon previous structure subsumed within it. The limits of formalization of any structure imply that a structure at a different level will always be found which will include the preceding one, but will not replace it. Piaget, in making this observation, was attempting to describe the developing ontogenetic characteristics that accompany the consequences of appropriate behavior when an individual attempts to solve problems through the manipulation of symbols. He took his inspiration from Gödel's idea that axiomatic systems are either complete or consistent, but not both. Since inconsistency is intolerable, the incompleteness of a system is the necessary result following from Gödel's discovery.

If we examine behavior analysis considering Piaget's adaptation of Gödel, we may begin with the idea that the system is necessarily incomplete on the assumption that it is (1) consistent and (2) fundamentally axiomatic in form if the laws involving reinforcement schedules are taken as the core of the system (on the argument presented above). My task then, is to show the way in which behavior analysis is incomplete and what this means for its development. The operations used in determining the basic laws of behavior analysis involve the manipulation of variables to produce various response changes due to schedules of reinforcement or altered stimulus conditions. Through these various manipulations, behavior analysts have been able to develop relatively simple functions that describe the nature of behavior–environment interactions over time. The explanatory product of this system is a series of mathematical functions that can be used to predict behavior. Let us assume for the moment that all possible behavior–consequence functions have been established. If this were accomplished the behavior analytic system would be complete in that all mathematical predictive functions describing the various types of behavior–consequence sequences would be written. From Gödel, we know that this would produce some contradictory functional statements. Even though Skinner (1956, 1981) did not consider his system to be hypothetico–deductive in form, if the behavior analytic system is derivable, in part, from premises external to those of the axiomatic schedules of reinforcement, as I have shown above, then it follows that the system is incomplete.

The Incompleteness of Behavioral Analysis

There is a sense in which behavior analysis strives to be a complete system. The principle that behavior is a result of its consequences applies to a great deal of human behavior that, in turn, accounts for almost everything that one would want to know about why people do and think what they do. Certainly physicists attempt to explain the behavior of all physical objects as well. The difference between the physicist and the behavior analyst, however, is that the latter use the very processes they are trying to explain to explain the process of explanation. The physicist does not. Hence the behavior analyst behaves verbally to explain and predict verbal behavior. The physicist does not behave as a physical object in explaining and predicting physical phenomena even though it is true that a physicist will fall at the rate of 32 feet per second per second if you drop him out of a window. Since an axiomatic system must strive for consistency or the system will be useless, we may assume that behavior analysts have the same goal. Demonstrating the incompleteness of behavior analysis should allow us better to see its future possibilities and thus strengthen the system. A look at Hume and Kant's concern with cause and effect might be a fruitful starting point.

David Hume (1739–40)/1961) recognized a dilemma when he could not distinguish between the arrangement of perceived objects that he believed were in a cause and effect relationship to one another and those he believed to be merely, that is accidentally, contiguous in space and time. The arrangement of objects or events following one another, or the idea of an object or event following the idea of an object or event that are merely contiguous, seemed no different to Hume than the arrangement of objects and events he believed were in a causal relationship to one another in the Aristotelian sense that the effect necessarily follows the cause. Because the power by which one idea produces another idea cannot be discovered by examination of either one or both of the ideas involved, it follows that cause and effect are relations of which we receive information from experience and not from abstract reasoning. According to Hume, causation depends on the epistemological characteristics of the inferrer rather than on the characteristics of the objects seen as cause and effect. When two objects are present to the senses and a relation of one to another is perceived by the observer (e.g., one object appears behind another object), the perception has nothing to do with reason. It is directly given where the mind (thinking) need not go beyond perception to comprehend the relative position of objects to one another. In contrast, the experience of cause and effect requires understanding to go beyond immediately given perception and utilize the idea of necessary connection between the two objects. From this, we are at least assured that the perception of one object was followed by the perception of another object.

If we observe the constant conjunction of two objects or their constant remoteness from one another, there is nothing in the objects themselves that allows us to conclude that they are always in this relationship. We do conclude that there is a yet indiscernible cause that unites or separates them. Of the three relationships producing the association of ideas (resemblance, contiguity, and cause and effect) only cause and effect involve processes beyond our senses. Causation is an idea involving at least two objects, thus it followed for Hume that it must have an accompanying impression. Clearly such an impression cannot adhere in any quality of the two objects involved in cause and effect because they are simple objects that can be found in non causal relations. The idea of causation, therefore, must be derived from some relation among objects.

Hume concluded that objects need to be contiguous in space and time in order to be perceived in a causal relationship to one another. As has been noted, the principle of contiguity is a characteristic of the association of ideas without necessarily implying causation. However, the basis of a complex idea of association is also that of contiguity in space and time. In addition, Hume considered that all objects can be either a cause or an effect.

Hume rejected the classical idea that the cause produced or compelled the effect because he could discover only contiguity and order in the cause and effect relationship. On those grounds he rejected the logical legitimacy of the classical concept of production of the effect by the cause. It therefore followed for Hume that every object that has a beginning does not necessarily have a cause. He argued that we can imagine a nonexistent event for the first time without the principle of necessity being conjoined in the process. It therefore can be assumed with equal facility that an event occurs with a cause or that it occurs without a cause. Hume recognized, nevertheless, that people hold to the idea of necessary connection between cause and effect. As the idea of necessary connection is neither derived from logical reasoning nor directly observable, the question arises of how individuals experience an idea of causation. Apparently some type of experience forces the notion of the necessity of an effect following a cause.

Hume never really distinguished contiguity from cause and effect to his satisfaction. We know that he could not make the distinction because he looked for it in the wrong place. He considered only the arrangement of objects and the ideas they generated and not the context of object and observer. It was left for Immanuel Kant to make that discovery.

Hume considered that there might be a human proclivity to make cause and effect assessments under certain circumstances, but he never discovered how this was legitimately done. Kant (1961/1781), of course, was energized by Hume's dilemma and the result was the launching of German philosophy. Kant takes account of the observer when a causal inference is made by first creating the twelve categories of mind or thought, of which one was cause and effect, and by describing the irreversible character of a causal inference. He also labels this and similar human processes "phenomena" and calls the principles by which the world works "noumena." Noumena are fundamentally unknowable. This placed the verbal designation "cause and effect" as an interaction between objects and processes we can recognize as part of the behavioral repertoire of human beings. In order to demonstrate how the category of causation is necessarily presupposed in the consciousness of an ordered experience, Kant distinguished between the consciousness of the merely subjective order of our apprehension and the consciousness of the objective flow of events. He gave two examples. If we apprehend a house by successively apprehending the different parts of it, there is no necessity to begin at the roof and then go to the basement. We could start at the basement and work our way up to the roof just as easily. We would not regard either of these sets of successive perceptions as representing anything characteristic of the house. On the other hand, if we see a ship gliding down a river, our apprehension of its place higher up in the course of the river must come first. It is impossible in the apprehension of this phenomenon that the ship should be perceived first below and then higher up. Here the order of the succession of our apprehensions is determined and our apprehensions regulated by that order. In the example of the house, there was no order in the succession of perceptions determining the point where we had to begin, whereas in the apprehension of the ship gliding down the river, the order of successive perceptions was necessary. We are compelled to apprehend the ship going down the river. We cannot reverse at will the order and apprehend the ship going upstream as we can reverse at will the starting point of our perception of the house. In order to distinguish objective from subjective succession, we must regard the former as compelling to our perception; that is, in order to be apprehended in objective succession, the movement of the ship must be understood as necessitated by causal connections. The category of causality is a logical presupposition of the objective succession of objects or events in time. All possible experience, that is, all objective knowledge of phenomena with regard to their relation in the succession of time, depends upon the category of causality. Kant's separation of the phenomenological from the ontological ideas of causation was to stay with us for a long time. However, a more useful conception of the ontological idea of causality is available to us today.

A causal law is any general proposition that allows us to infer the existence of one object or event from the existence of another or several objects or events. Over successive applications of the causal law, the specific objects and events will be different, but the relationships among classes of objects and events will remain the same. A certain relationship among classes of objects and events is the essence of a causal law. The order (E follows C) among the relevant objects or events of the law leads us to expect certain results specifically because of it. This expectation is the same as that mentioned by Hume in his psychological analysis of causal inference natural to all individuals. Bertrand Russell (1960, 1962) referred to this as an animal belief (knowing how) in causality and noted that it can be observed in horses, dogs, and other animals. This propensity usually results in human beings (only) referring to one event as cause and to another as effect (knowing that). This identification is more primitive, however, than the idea contained in the concept of causal law that involves a statement of invariance and not merely an expectation of succession.

Induction by simple enumeration is not sufficient to establish the generalizations of science. A generalization must be considered within the context of a scientific system of which it is a part (Lana, 1991). The method by which we establish hypotheses within a scientific system is therefore of central importance. It must be shown how the constant order of two or more events with the addition of a doctrine concerning the use of generalizations can be combined to account for the idea of necessary connection in the causal sequence while minimizing the use of a priori assumptions. An inductive hypothesis of simple antecedence of cause from effect is well established if it has not been refuted by experience and has been confirmed by a number of positive instances. The linkage between the verbally held validity (subjective) of making an inductive inference and its objective validity, which mirrors a contingent characteristic of the universe, is the effectiveness of the belief in the validity. Effectiveness is, in turn, established by a confirmation of an expectation held by the inferrer. Any law-like statement of invariance between two or more events or objects gains validity from one or both of two sources: (1) the statement's instances are validated by induction and (2) the statement holds a necessary position within a series of logically and empirically linked statements. In their complete form these statements, will be hypothetico–deductive (e.g., the various laws of the fixed and variable ratio, and of the fixed and variable interval). It is now possible to conclude that the nature of the elusive concept of necessary connection between a cause and an effect that so plagued Hume is attributable to the logical position the cause and effect inference holds in a coherent system (theory) of similar, related statements (see Lana [1991] for a detailed discussion of this point). This brings us around again to Gödel and Piaget's sense of the axiomatic in building explanations, particularly of human thinking.

That aspect of human verbal behavior that is active when a cause is inferred cannot be part of the system constructed to explain causally whatever a person is predicting by using the system (knowing how and knowing that). That is, all axiomatic explanatory systems that are consistent are necessarily incomplete. Therefore, behavior analysis is necessarily an incomplete system (as are all systems of explanation) and, further, it cannot, in principle, explain all human behavior by reference to the axiomatic core of the system, i.e., the laws of fixed and variable ratios and intervals, etc. This will be true even if behavior analysis becomes so successful as to develop a formal axiomatic set of predictive statements regarding behavior. Does behavior analysis claim to be complete or capable of completion? No. At least I don't think so. What I hope I have done so far is to provide an analysis that allows us to see the structure of behavior analytic assessment in a somewhat different way than is usually presented to strengthen its overall value. How then does behavior analysis "overcome" its incompleteness? The answer lies with the behavioral repertoire.

The Behavioral Repertoire

The incompleteness of behavior analysis in the sense argued above, is what requires the creation of the idea of the behavioral repertoire. As I have argued, the laws of behavior embodied by reinforcement schedules constitute the core of a possible hypothetico–deductive system that behavior analysis is or might become. Since we know this to be impossible to complete, what is required is another related non-contradictory system to allow it to progress. That other system is the behavioral repertoire. Certainly from the 1950's and before, Skinner (1953) identified the behavioral repertoire as containing patterns of behavior that were built during the life of the individual so that they became potential ways of responding to certain environmental situations. Skinner (1953, pp. 422–423) tells us that ". . . our subject will show a strong curiosity about nature if exploratory responses have frequently been reinforced . . . ." In addition, the genetically developed characteristics of an organism were also placed in the behavioral repertoire. Birds fly and pigs do not for reasons that have less to do with the environment than to genetic endowment. That aspect of the behavioral repertoire that involves genetic endowment requires a different axiomatic system, e.g., biochemistry, to account for these behavioral tendencies. There is nothing I've said so far that, I believe, should be particularly disturbing to a behavior analyst and, indeed, behavior analysts have acknowledged that this genetic component is outside of the explanatory system that constitutes behavior analysis (e.g., Skinner, 1976). In those situations where the behavioral repertoire has been established over some part of the organism's lifetime, the method of procedure may be more complicated.

Verbal and other forms of social behavior have critical, non-experimentally examinable histories (c.f. Glenn and Malagodi, 1991; Wanchisen, Tatham, and Mooney, 1989). These histories need to be described and by so doing, our observations will shift from the process of behavior and consequence to the content of the specific historical behavior in the verbal–social community. This is an analogous procedure to shifting from shaping flying behavior in a bird to describing the evolutionary history of the bird's wings. Understanding this history may ultimately improve our ability to make successful predictions about birds' flying behavior. Then again it may not. However, with human verbal and other social behavior, there seems to be little doubt that we will improve our predictive ability with accurate description of the social repertoire. For example, we can describe whatever African–American resentment toward the larger society that we may find by referring to current societal reinforcement patterns. Law-abiding African–Americans cite instances of whites crossing the street to avoid them, or police stopping their vehicles for no apparent reason. These instances undoubtedly reinforce the behavior we label "resentment" as it appears in all of its forms. Can we fully describe African–American resentment toward established society by reference to current reinforcement patterns? Obviously not. A cultural history is relevant as well. By attending to the description of historical social patterns, we bracket discussion of how the process of behavior–consequence occurs whenever and wherever it occurs. Instead, we focus on what behavior has been reinforced over an extended period in the terms directly descriptive of the social situation in question, i.e., the estrangement of many African–Americans from the white establishment develops in part because of their knowledge of and resentment toward 19th century slavery, Jim Crow laws, etc. Rachlin's (1995) idea that self-control, so often used as a description of important human behavior, is a molar–molecular conflict in the development of behavior patterns is analogous to the scale shift described here.

This brings us to another important distinction, that between description of a social event made by a disinterested observer and that made by a citizen-participant of the same event. Societies create myths that are often, but not always, behavioral prescriptions for its members, but almost never for the disinterested (scientific) observer. To name but a few: the frontier, selfsufficiency myth of America, the "elan vital" of Henri Bergson and the French during World War I, and the idea of the "ubermensch" of Nazi Germany. All of these myths must be taken, in part, as prescriptions for behavior that characterized a community during a particular historical period and which still may have manifestations in today's society. Objective observers always attempt to debunk myth and look for the actual reinforcers that account for the behavior in question, as they should. However, believed myths are often real in their consequences as we know only too well from historical example. I propose that these historical myths, along with other social history, are part of the social behavioral repertoire and must be studied as such. Indeed, Skinner (e.g., 1957) has frequently referred to the "verbal community" without identifying where those social processes come from. This is the job of the social psychologist, among others. The behavioral repertoire includes the structural characteristics of the organism. I further suggest that the social history of the group provides an analogous "structure" from which current behavior sometimes can be predicted. Used in this way, the behavioral repertoire is outside of the principles of operation of behavior analysis as it exists as an actual or potential axiomatic system yielding correct predictions. It follows that the behavioral repertoire, as an idea, supports and extends behavior analysis, which is an incomplete axiomatic system. With the behavioral repertoire, behavior analysis can be a vigorous, continually evolving system of explanation. The physiological aspects of the behavioral repertoire are finite although we have much to learn about them. Social history and context, however, are virtually infinite since environmental context can continually change as, e.g., should the planet Mars become a new environment for colonizing humans. This focus on social history can establish the peculiar details that were involved as discriminative stimuli and the eventual behavior–consequence linkages in the past that act as context for the present.

Conclusions

The behavioral repertoire has a dual characteristic. It exists within the causal terms of behavior analysis when one refers to repertoire that is the result of former behavior–consequence sequences, and exists outside of the axiomatic structure of behavior analysis when it refers to the genetic composition of the organism or the specific history of the group context in which the individual functions. The behavioral repertoire exists at the boundary of behavior analysis as an axiomatic, or potentially axiomatic, system. It indicates where behavior analysis is incomplete in the Gödelian sense used throughout this paper. If my extrapolation from Gödel is correct, then we know the details of this incompleteness. Although this may seem merely a technical argument, I believe it does lead us to a possibly different focus in certain social analyses that expands behavior analysis in the direction of specific social description. In at least some particular cases, an analysis of what social behavior is reinforced under what circumstances will be more useful than discovering the processes of reinforcement themselves (cf. Patterson, 1982). Another way of saying this is that behavior analysis is about process and social psychology is, or should be, about the social-historical content of the behavioral repertoire.

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