BEHAVIORAL DEVELOPMENT

CONTEXTUALISM IN BEHAVIOR ANALYSIS OF DEVELOPMENT: UPON FURTHER REFLECTION 1

Martha Peláez Florida International University

The notion that contextualism has evolved as an alternative to organismic and mechanistic metamodels or world views of human development has received much attention in psychology during the last few years (e.g. Reese, 1991). In behavior analysis, there has been enormous discussion and debate over the questions of whether behavior analysis is mechanistic or contextualistic (e.g., Marr, 1993a, 1993b; Morris 1993a, 1993b), and on the issue of whether behavior analysis has a mechanistic ontology and a contextualistic epistemology or if it has both a contextualistic ontology and a contextualistic epistemology (this idea has been discussed by Barnes & Roche, 1994, and argued by Reese, 1994). Also, there has been discussion on whether we should exercise descriptive, narrative, constructivist, and interpretive forms of contextualism or if we should limit ourselves to a functional contextualism which requires experimentation. I do not attempt in this paper to elaborate again on these issues. Instead, in my analysis I will adopt the following propositions--even though some behavior analysts may feel uncomfortable with them:

1) Behavior analysis can be framed within a contextualistic world view (Morris, 1988; 1992; 1993b, 1994; and Hayes, 1988; Hayes, Hayes & Reese, 1988).

2) Behavior analysis can have both a contextualistic

ontology and a contextualisitc epistemology (Barnes & Roche, 1994).

3) Behavior analysis can be exercised within both descriptive and functional contextualism. That is, even though functional contextualism has an intensely practical purpose for behavior analysis given that its goal is prediction and control of behavior, it seems possible to exercise behavior analysis within other forms of contextualism that more readily stay true to its underlying root metaphor (the act in context) like descriptive and interpretive analysis (Hayes, 1993; Dougher, 1993).

Based on these three premises, in this paper I have two objectives:

1) To outline several conceptual and practical reasons that may explain why developmental theorists, including behavior analysts, have recognized contextualism as a metatheoretical (philosophical) framework for the study of human behavior and development;

2) To exemplify the inherent contextualism of behavior analysis by identifying several areas of study and research programs. In this endeavor I will raise problems with some traditional behavior-analytic research methodologies.

Reasons for Adhering to Contextualism

I shall begin with the reasons for recognizing the inherent contextualism of behavior analysis. There are

several conceptual and practical reasons that may explain why developmental theorists, including behavior analysts, have embraced contextualism as a metamodel for the study of human behavior:

a) Unlike the organismic metamodel, behavioral development in contextualism is not teleological, goaldirected, nor channeled into particular directions (as it is, for instance, in the traditional cognitive-developmental approaches of Piaget and Kohlberg).

b) Unlike the mechanistic metamodel, contextualism is not elementaristic or reductionistic (Pepper, 1942). A behavior analysis based upon contextualism adheres to a holistic view, in which neither responses nor stimuli have any psychological meaning by themselves. Rather, their meaning lies in the interdependent relationship between stimulus and response functions in context. Hence, the meaning of behavior emerges from its interacting context.

The child does not merely interact with the environment in a unidirectional, linear, or passive (reactive) manner. Instead, the child and its environment dynamically interact or "transact" with one another. (By "transact" I mean that a strong reciprocal interaction takes place among constantly changing stimuli and response functions.) Hence, the particular metamodel chosen by the theory will influence not only the topics to be investigated, but also the methods used, the variables manipulated, and the conclusions reached by the researcher.

Early behaviorism is often associated with a mechanism that adheres to elementarism and reductionism. The goal was (and for some researchers still is) to reduce behavioral changes to their prior immutable forms, and the scientist's task is to analyze behavior in terms of its antecedentconsequent (cause-and-effect) relations and the temporal ordering of both the dependent and the independent variables. However, behavior analysis of human development is not S-R behaviorism (see Day, 1992); rather it is a scientific system and a discipline dedicated to understanding the nature and complexity of behavior, the behavior of organisms that are actively contributing to their own behavioral development.

The case is not against basic laboratory work, nor controlled experimental research. The argument is against strict mechanistic and organisnic accounts of behavior. Whether simple or sophisticated, discrete or consolidated, mechanistic and organismic accounts seem to fall far short of explaining the developing behavior patterns of a growing child. Some of us are no longer satisfied with merely the study of simple cause-and-effect relationships between objectively observable dependent and independent variables; this alone is insufficient for understanding behavioral change.

Even when we can control for initial or boundary

conditions, and can demonstrate that variable X causes changes in behavior Y, our understanding remains incomplete. Morris has made the point that "the function of behavior emerges from an ever-changing context" (Morris, 1988, p. 309). To understand behavior we need to know its function, that is, its meaning or purpose; to accomplish this knowledge, we must study and discover the interrelated contextual factors that alter such functions.

As part of my research program, one goal is to move into the analysis of the contextual determinants of infant behavior. In early intervention programs for infants of depressed mothers, for instance, one of our goals is to train mothers to interact properly with their infants; to promote positive interactions (see Peláez, et al, 1994; Malphurs, et al. in review). To accomplish this, mothers are trained differentially, depending on their type of depression. Those depressed mothers who are typically withdrawn and unresponsive to their infants cues receive training, for instance, using an attention-getting procedure. They are trained to elicit and to contingently respond to their infants' initiations of given behaviors. On the other hand, those depressed mothers who have been identified as having an intrusive and overstimulating behavioral pattern are trained to decrease the amount and degree of stimulation and the contingencies they provide their infants, for instance, one such procedure is imitation. Eventually, a mother learns to regulate her own behavior and also learns to readily detect the behavioral cues that her infant emits during the interaction.

During training, one such cue that the mother needs to identify is the infant's state of arousal (Odom & Haring, 1994): Infants vary their state of arousal from deep sleep at the low end, to active alert in the middle, to high arousal at the high end. If a mother initiates an action when the infant is at either end of the arousal continuum, it is unlikely that the infant will respond positively. A mother can readily detect these states following training. Hence, the infant's state of arousal is an intrachild variable reflected by the infant's overt actions that set the context for the next interaction. But more importantly, the infant's state of arousal may change during the interaction. Then, a mother adjusts the quality, timing, and intensity of stimulation provided. Thus the interaction is a dynamic ever-changing process -- as it is in real life settings. (This type of approach is at least the start of an empirical contextualistic investigation within behavior analysis).

To study the "act in context" also means to know about the *historical* context. The historical context includes the individual's past learning experiences and history of contingencies of reinforcement. This history of contingencies is certain to influence the functional relations among stimuli and responses in subsequent interactions. The historical context thereby establishes the reinforcing contingencies that will be effective for behavior change and development. The reported data of many studies are suggestive of historical context as an important contextual determinant of behavior and learning (e.g., Wanchisen, 1990).

Challenging Contextualism

Some behavior analysts have challenged the contextualistic view by arguing that immense behavioral complexity can be encompassed within a mechanistic metamodel (e.g., Marr, 1993b; Staddon, 1993). For instance, Marr (1993a) stresses the point that a mechanistic perspective "is potentially capable of capturing even the deep mysteries of behavioral dynamics" (p. 63). His mechanistic view is not a simplistic account. He emphasizes that there is no need to abandon a mechanistic perspective to embrace a contextualistic view because the former implies the latter, meaning that mechanism deals with context (more on this later). For Marr, the boundary or initial factors (e.g., level of deprivation, reinforcement history, motivation) are not part of the laws of behavior (e.g., reinforcement); these variables only provide the context for interpretation of those laws. In his words, "initial and boundary factors define and set the limits under which a given law will apply...they provide a frame of reference to assess those laws" (Marr, 1993a, p. 62).

Boundary Conditions are only One Kind of Contextual "Interactants"

Contextual determinants, however, are not restricted to the static boundary or initial conditions. Contextual factors refer to the "contextual interactants." (The term "interactants" is borrowed from Oyama, 1985). Contextual interactants is a generic term for all developmentally relevant factors or participants (see Midgley & Morris 1992). I prefer the term "contextual interactants" over the other existing terms, such as "setting factors," "setting events," "establishing operations," "potentiating variables," "third variables," "contextual determinants," because it is not always clear what these other terms are intended to encompass. I restrict the usage of contextual interactants to identify fundamental classes of variables that interact with the behavior of the organism and with the operative contingencies. The term, however, is not limited to those conditions that facilitate or constrain the efficacy of reinforcement stimuli (e.g., deprivation), nor to the boundary or initial/static conditions controlled by the experimenter in the test chamber (e.g., temperature, or light). Moreover, contextual interactants are not limited to motivational variables or establishing operations (Keller & Schoenfeld, 1950). An establishing operation is an event or stimulus condition that affects an organism by momentarily altering the effectiveness of the reinforcer and, in turn, the organism's responses (Michael, 1993). The effects of the contextual interactants, however, are not limited to momentary effects; they can produce relatively stable behavioral changes as a result of their reciprocal interaction (interrelation) with the organism and with the contingencies affecting its behavior. These. they are continuously and interactants are not static; dynamically interacting with the organism. (A taxonomy of current and historical, phylogenic and ontogenic context has

been outlined by Morris, 1992).

In the last decade, new behavioral principles have emerged that describe the role of contextual stimuli on emergent behavior (e.g., Sidman's work on stimulus equivalence and emergent verbal classes, 1986; Hayes's relational frames work, 1991; functional equivalence demonstrations by Dougher & Markham, 1994). It is conceivable that these new principles can be integrated effectively into the system of principles that comprise behavior-analytic theory, reinforcement, punishment, and extinction (Shull & Lawrence, 1993, p. 243). Today, we know that context (both current and historical) defines the limits within which behavioral principles will work. But without analyzing and manipulating context, the behavioral principles of reinforcement, punishment, and extinction may not be identified correctly, and the behavior change obtained as a result of our functional analysis or experimental manipulations may not be understood. Moreover, interindividual differences and intraindividual variability would remain unexplained. More precisely, we might be able to predict and control behavior, but without knowledge of the contextual factors (organismic and environmental) affecting (altering) the functional relation under study, we would fail to understand the complexity of the behavior and its origins.

A Problem with Traditional Research

Let me highlight what I consider to be the overriding problem in traditional behavior-analytic research. In the experimental analysis of behavior, the typical procedure is to consider the initial contextual conditions (e.g., food deprivation, pre-experimental history of reinforcement) as a potential source of behavior variation and to hold these conditions constant. In doing so, the researcher removes these boundary conditions from the contingency manipulations thereby constraining behavioral variability reflected in intra-and interindividual differences. But it is precisely the multidirectionality of behavior and its variability within and between subjects that are the phenomena of interest in the study of behavioral development; without variability behavioral development is difficult to understand.

The contextual interactants emphasized here not only inflect behavior changes, but also affect the *interplay* among stimulus and response functions. Because they interact *reciprocally* with behavior, these variables can be seen to alter the functional relations within the three-term contingency. Perhaps this is one reason why more behavior scientists are beginning to analyze behavior interacting with context.

A New Stage of Scientific Behavior Analysis

In the behavior analysis of development, changes in the dependent variable (e.g., response frequency) are difficult to understand outside the network of the contextual interactants. It is true that in the past, using different terms, several behavioral theorists have recognized in their conceptualizations that the reinforcement relationship is contextually determined (e.g. Bijou & Baer, 1961; 1978; Gewirtz, 1972; Kantor, 1933, Michael, 1982; Morris, 1988; Skinner, 1938). But not until the last few years have researchers begun to develop an explicit program of research to demonstrate the effectiveness of a contextualistic approach to behavioral development (see Morris & Midgley, 1990 for review of such research programs). As Odom and Haring (1994, p.92) have stated:

Contextualistic behavior analysis moves the unit of analysis from the response to all three members of the three-term contingency... planning behavioral interventions requires an examination of the factors that alter the effectiveness of discriminative stimulus and reinforcement. Equally important, it opens the possibility for creating larger units of analysis.

The inherent contextualism of behavior analysis can be identified in various research programs, in basic and applied research. There has been some recent work that has improved our principle-based understanding of contextual interactants of behavior by moving behavior analysis beyond the mere analysis of the components of the three-term contingency paradigm. Today, researchers are interested not only in controlling Skinner's "third variables" (or initial/boundary conditions like food deprivation). They are, in addition, investigating the transactional and dynamic nature of those relationships (e.g., Keehl, 1980).

New approaches and research techniques have revealed previously unknown effects of manipulating context, for instance, manipulating the normally stable features of the experimental test chamber and the effects of changing context in conditional discrimination training and learning. New principles are emerging that describe the various effects of contextual stimuli as a result of their participation in simple and higher order contingencies. In some cases, the new principles can be integrated effectively into the system of principles that comprise behavior-analytic theory; such are the cases of stimulus equivalence (e.g., Sidman, 1986); functional equivalence (e.g., Dougher & Markham, 1994); and relational frame theory (Hayes, 1991) naming (Dugdale & Lowe, 1990). More and more, behavior analyst are interested in conducting a conceptual and functional taxonomy of environmental stimuli altering behavior (e.g., Schlinger, 1993), and the motivational functions of stimuli (Michael, 1993).

The studies by Wahler and Fox (1981) reflect improvement towards a conceptual and methodological expansion in the study of setting events in applied behavior analysis. Also, research by Odom and Haring (1994) examines the contextualistic view of behavior analysis and its implications for educational practices in early childhood and special education. Their studies exemplify how contextualism as a world hypothesis can be use as a conceptual framework for applied behavior analysis studying and intervening with young children with developmental disabilities. Also some of these investigators begin by conducting ecobehavioral assessments in their analysis.

In the area of *moral development*, we know that the child's moral reasoning (measured by their verbal judgments) can influence and direct their moral actions. The moral behavior patters of the child are a great deal more complex than the behavior of nonverbal organisms studied under strictly controlled laboratory conditions. The reason seems to be that once children have acquired language most of their moral behavior is governed by complex rules. A contextualstic behaviors, applied in investigations of rule-governed behavior and stimulus equivalence may allow researchers to study human cognition. Current research in these areas represents a step in such direction.

Also in the area of verbal behavior, Dougher (1993) has proposed the usage of hermeneutic or interpretive research methods in the contextualistic analysis of verbal interactions. Unlike hermeneutics, he says:

...contextualism does not and should not avoid experimentation as а method... From а contextualistic perspective, experiments are not qualitatively different from naturalistic investigations; they differ only in terms of their degree of complexity. The pragmatic approach is to use experiments when they are useful and naturalistic/interpretive methods when they are useful. With respect to the study of verbal behavior, there are conditions under which both, interpretive methods and experimentation are useful. If one is interested in verbal behavior as it occurs in interpersonal settings, interpretive methods seem to be the way to go. There are many contexts that are simply too complex to capture in a laboratory setting..and verbal interactions comprise constantly evolving contexts that are particularly well-suited for interpretive analysis (p. 218).

To those behavior analysts who rely only on experimentation to understand behavior, the results of interpretive methods might seem speculative and subjective. However as Dougher (1993) suggests: "experimental knowledge is no different from any other knowledge; experimental results require as much interpretation as any other kind of data" (p. 218). Day was very much influenced by Skinner's book on verbal behavior, which he saw as an essentially interpretive account of verbal behavior. Day's interpretive analysis was clearly looking for the functional relation between identified verbal behavior and its antecedents. The point is that whether interpretive or narrative or descriptive, new research techniques that focus on the functional relation between behavior and its contexts seem consistent and could be exercised within behavior analysis. Descriptive and interpretive contextualism are valid to the extent that they allow us to identify variables that predict behavior.

Concluding Remarks

In this analysis, my main assumption has been that behavioral development does not depend solely on the behavioral principles (e.g., reinforcement, discriminative stimulus) and operations (e.g., reinforcing, evoking). Both contingencies and context (historical and current) play primary roles in predicting, controlling, and understanding behavior change. Moreover, I have emphasized the function of contingencies depends on the interacting context. Consequently, the probability of an individual *learning* at a given developmental point will vary not only as a function of reinforcement (or punishment) history, but also as a function of the current contextual elements thereby altering the ongoing interaction.

Framing behavior analysis within a contextualistic world view may help behavior analysts interested in development account for phenomena such as the multidirectionality of behavior development, intraindividual variability, and interindividual differences. Contextualism points to ways in which some difficulties may be solved. If behavior analysis is embedded within a contextualistic framework it may work more successfully with existing data and it may generate new information about human behavior. Within contextualism, behavior analysis, as an approach, holds promise for a more comprehensive and more situated understanding of human behavioral development than has been achieved thus far. Perhaps the change and the growth that has taken place in behavior analysis within the last decade suggest that behavior-analytic theory may be undergoing a paradigm shift or may be moving into a new stage of scientific evolution.

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POSTDOCTORAL FELLOW POSITION

The Mental Retardation Research Training Program of Peabody College, Vanderbilt University, offers a NICHD-funded postdoctoral fellowship in mental retardation or atypical development research. The program is closely associated with Vanderbilt's John F. Kennedy Center, one of 14 NICHD-funded national mental retardation research centers. Applicants should have a PhD in psychology, special education, or a closely related area and be_interested in learning to conduct research relevant to children and adults with developmental disabilities. Applicants whose primary interests and background are experimental or developmental psychology are especially urged to apply. Several recent fellows have obtained NIH funding to support their research by the conclusion of their postdoctoral program and have gone on to faculty positions in major research universities. Start date is negotiable. Send resume

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Forthcoming! A Behavior-Analytic View of Child Development by Henry D. Schlinger Jr. Western New England College Published by Plenum Press.

The purpose of A Behavior-Analytic View of Child Development is twofold. First, the book introduces behavior analysis to the reader. It is frequently said that behavior analysis is anti-theoretical or that it is at best a collection of unrelated, trivial facts. The book will hopefully disprove both ideas. This book shows that behavior analysis has a strong claim to theory in the natural science sense of the term. Second, and more important, the book will show how behavior analysis can be used fruitfully to interpret existing research in developmental psychology, thus offering the field a more unified theoretical approach. Although A Behavior-Analytic View of Child Development is intended primarily as an explication of behavior analysis as it relates to child behavioral development, throughout the book the behavior-analytic approach is consistently contrasted with a more traditional psychological approach to similar problems.

CONTENTS: The book is composed of two major sections. The first three chapters comprise the first section and deal with the concept of theory in developmental psychology. In Chapter 1, science is defined and several criteria for evaluating good scientific theories are discussed. In Chapter 2, the main features of traditional approaches in developmental psychology are presented - largely as structural theories based frequently on normative, correlational data. Chapter 3 introduces behavior analysis as it will be used throughout the book to interpret developmental research. Chapters 4-10 comprise the second major section. Here, behavior analysis is used to interpret research in the development of infant memory (Chapter 4), motor development (Chapter 5), perceptual development (Chapter 6), cognitive development (Chapter 7), language development (Chapter 8), the development of attachment relations (Chapter 9), and the development of prosocial behavior (Chapter 10). For information write or call: Henry D. Schlinger, Ir. Western New England College, 1215 Wilbraham Road Springfield, Massachusetts 01119. Phone (413) 782-3111