

A CRITIQUE OF STAGE THEORIES OF HUMAN DEVELOPMENT

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Developmental psychologists have attempted to understand the processes of change, growth, and function in human development. Theories of development stemming from Freud's (1940/1964) psychosexual model, Erikson's (1963) psychosocial model, Piaget's (1970) cognitive model, and Kohlberg's (1963) theory of moral reasoning all viewed development as comprising a series of discontinuous stages. For instance, Freud viewed human development as a sequential process of libidinal progression. Erikson expanded on Freud's approach to include the role of socialization and environment in human development. Jean Piaget's four-stage development theory of cognitive processes describes development as a discontinuous and monotonic process. Also using a stage model, Lawrence Kohlberg explored moral development as a cognitive process that matures over time.

These traditional theories differ from a behavior-analytic approach in that they define development as moving through fixed stages rather than in terms of the dynamic interaction between individuals and their environment. These long-established developmental theories have characterized development as growth, be it physical, psychosocial, cognitive, or moral, through age-specific stages. However, even though the stages may tell us what children are "likely to do" and at "approximately what developmental level or age," they do not tell us "how or why the children are able to do it." This indicates that the process is largely unknown to mainstream developmental theories (Schlinger, 1992, p. 36).

A stage is a construct that places the individual in a particular sequential frame. Several stages are said to occur during the life span of the individual from conception through death. While the concept of stages and structures in developmental psychology can help the organization of data and exchanges between researchers, it serves only to describe the "sequence of change" instead of "explaining the processes and mechanisms" responsible for stage progression or change (Gewirtz & Pelaez-Nogueras, 1992, p. 1416). On the other hand, the behavior-analytic approach provides some theoretical uniformity of development and offers a better position to interpret the behavioral changes that involve development (Schlinger, 1992). Behavior-analytic viewpoints differ from those of most developmental theorists on how the process of development occurs.

In this chapter, we examine from a behavior-analytic approach developmental issues such as using age as a construct for development, maturation, structure versus function, description versus explanation, and reification. We also discuss theoretical implications and practical applications of behavior analysis relevant to social services and social work practitioners.

THEORETICAL FOUNDATIONS OF BEHAVIOR ANALYSIS

Age and Time as Variables

Development is most commonly defined in the scientific community as a progressive, observable, and age-specific behavior change over time (Gewirtz & Pelaez-Nogueras, 1996; Schlinger, 2002). However, even though behavior change usually occurs with increasing age, age is not a determining factor in behavior change (Baer, 1970; Rosales-Ruiz & Baer, 1997). Gewirtz (1969) has made the case that *age* is a pure index only of the passage of time in the physical world, during which time there operate the process variables directly involved in development.

Mainstream developmental theorists, however, have studied development by assigning time, in the units of years of age, as a measure that explains behavior (e.g., Gesell, 1933). *Time* is a concept that is definable and should be treated at its most simple level, but not used as a causal variable to explain psychological events (Pelaez, 2002). Undeniably, the passage of time affects each individual across the life span, and the concept of time is used in all disciplines. As an illustration, consider sports science, for which time is a significant variable. Time in seconds is the key to winning contests and is an important measure of increased or improved physical ability; however, it does not explain to any extent *why* a runner's time might have improved. Hence, time is not appropriate to use as a variable to explain a behavior change, in this case increased physical ability. Variables that would influence the runners' physical ability include strengthening muscles, improving diet, increasing cardiovascular endurance, and refining technique and focus. Each or all of these may be effective in shortening the length of time it takes to run a distance. The measure of this improvement would include a comparison of the runner's time in seconds before and after training. However, running time only gauges a runner's performance and does not explain how the runner achieved better results.

Using similar faulty reasoning, some developmental psychologists have attempted to use temporal variables, such as age, points in a sequence, or presumed stages, as an explanation for the elaboration of behavior. Behavior changes are as diverse as each individual and can be catalogued to some degree by the unit of age. Although age is useful to organize the differences in behaviors of individuals over a scale of years, it is an empty variable in regard to explaining behavior, just as seconds cannot be used to explain the improvement of the runner (Baer, 1970; Gewirtz, 1969). Time also reflects the cumulative effect of unknown variables and processes as time affords experience and exposure to stimuli that in turn influence the advent of changes termed "maturation."

Maturation

Maturation typically refers to the physical and behavioral change suspected of being due to biological growth. This process naturally occurs in every organism, but at different rates. When a short-term change in behavior cannot be credited to learning or to some short-term performance operation, such as environmental contingencies, it is often classified residually as due to maturation. Gewirtz (1978, p. 115) has defined the term maturation in two behavior-change contexts. He explains that "a topographically-complete behavior" can suddenly appear in a child's repertoire, either "with or without an identified stimulus

basis,” or that “a primitive approximation of a response” can suddenly appear in a child’s repertoire, “with or without an identified stimulus that with monitored practice or simply the passage of time approaches the final topographic form of the response” (p. 115). In sum, maturation is not assumed due to biological factors alone. The impact of environmental stimuli should be taken into account for behavior changes.

Nature/Nurture as a False Dichotomy

Is human development a result of biological forces, environmental factors, or both? Traditional theorists have treated the nature/nurture debate as an either/or. The reason nature/nurture is a false dichotomy is that, from the moment of conception, both genetic inheritance and interactions with the environment are important causal factors in the individual’s development (Novak & Pelaez, 2004). Modern behavior scientists believe that both biological and environmental influences are multilinear and interrelated (Morris, 1992; Pelaez-Nogueras, 1996); no genetic material can become an organism without interacting with its particular environment. According to Pelaez-Nogueras and Gewirtz (1997), attempting to analyze the contribution of one without the other is nearly impossible and often meaningless. When the nature/nurture issue is recognized as a false dichotomy, both viewpoints need to be assimilated into any theory or method of study. This would eliminate *both* the use of age as the sole framework for explaining observed behaviors and the compulsory categorization of behaviors according to a purported developmental stage.

Description and Explanation

The practice of using description as an explanation is another aspect of stage theories that needs further clarification. Description and explanation are two goals of science and of developmental psychology. Unfortunately, they are often confused because virtually all explanations are descriptions but not all descriptions are explanations (Pelaez, 2002). Descriptions tell us what is there, whereas explanations elaborate why it is there (Bergman, 1957, cited in Reese, 1999). Description delineates or gives an account of. And as Marr (2003, p. 183), has stated, “Careful description is, of course, essential to satisfactory explanation. . . . What constitutes a description or an explanation is, however, at the heart of the controversies that [yet] range among those calling themselves ‘behaviorist.’”

Circular explanation is an issue that needs to be addressed when discussing human behavior. It is often used to label a specific behavior without providing a cause-and-effect relationship clarification. For example, a child who is experiencing sleeping and eating difficulties, loss of interest, tiredness, problems with concentration, and extended feelings of sadness is labeled “depressed.” Recognizing symptoms associated with depression describes the disorder. It does not explain it, however. If someone were to ask, “Why is this child having problems sleeping or eating?” or “Why is this child always tired and having problems concentrating?” it would make no sense to answer, “Because the child is depressed.” This is tautological practice and a good example of circular reasoning. Moreover, invoking the label offers no new information and provides no explanation; it is merely shorthand and a redundant description *of* the problem behaviors. A number of developmental psychologists attempt to explain behavior through observing and identifying the key

characteristics of the behavior. Circular explanation is devoid of scientifically supported findings and relies entirely on the description of the phenomenon as a substitute for any independent true explanation of the behavior.

Those who focus on the development of hypothetical structures miss some of the observable behavioral phenomena that are of importance in development. They might explain an individual's helpless behavior as due to a dependent personality. This might refer to chronic and frequent dependent behavior. Although this label or description is often useful to know the history of the individual, it does not truly *explain the "dependent" behavior outcomes*. Also, one cannot say that a person acts helpless or dependent because he or she has a "dependent personality" and claim to have illuminated the causes of the behavior. These pseudo-explanations do not lead to better prediction or control of the behaviors or mental capabilities being studied, and they usually invoke inferred, internal processes as causal factors, proposing hypotheses that are difficult to confirm or disprove with empirical research.

Reification

Reification is another objectionable practice in which stage theorists often engage. Behavior analysts object to this usage because it can only obscure the true explanations of behavior and complicate the analysis. For instance, typically, reification occurs when a verb is replaced with a corresponding noun. This practice results in treating a hypothetical construct as a real cause of the behavior change. When locating the causes of behavior "inside the child" we begin to "describe the child," *and not the environment*, as the "originator of his or her actions." For example, after contact with environmental stimulation, the child is often said to have "sensed," "perceived," "remembered," or "judged," as if these verbs referred to real "observable actions" (Novak & Pelaez, 2004; Schlinger, 1992). Taking this even further, "thinking" gets reified as "thought," "remembering" gets reified as "memories," which in turn become "representations" that are said to be stored and retrieved (Novak & Pelaez, 2004). But none of these phenomena can be directly observed or tied to their referents in the external world that presumably contributed to their existence. These representational words need to be put into tangible observable behaviors that can allow for measurement. Unfortunately, many mainstream developmentalists use such common but imprecise wording when explaining child development.

Stage theorists, such as Piaget, fell into the verbal trap of reification with their cognitive explanations of development. For example, 24-month-old infants behave a certain way toward objects under a wide range of conditions of their absence. Piaget termed these observed behavior-environment interactions "object permanence." Consequently, when infants are finally able to behave appropriately with respect to objects that are out of sight, it is said that they can do so because they now possess the concept of object permanence or the mental capacity to represent objects. Object permanence, which began as the name for certain observed stimulus-response relations, has become a thing (a structure or process) located inside the child that is said to be responsible for the observed behavior (see Schlinger, 1992). Though many psychologists have recognized the limitations associated with reification, there has been little done to diminish such practices.

Function versus Structure

Some theorists study development by focusing on the structure of the behavior (e.g., psycholinguistics), and others focus on its function (e.g., behavior analysis of verbal behavior). Although both approaches are valid and can provide complete and adequate explanation (Novak & Pelaez, 2004, p. 36), they represent two opposing ways to understand human development. Structural approaches such as Chomsky's (1968) theory of language reference verbal behavior indirectly, through implied activities of the mind, appealing to devices that are neither directly observable nor measurable. Skinner's (1957) analysis of language, on the other hand, is pragmatic and focuses on observable verbal behavior and on functional aspects of language. Other classic examples of unobservable constructs are Freud's ego, superego, and id; Piaget's cognitive structures, schemata, and rules; and the information-processing model's input, storage, and retrieval systems of executive-controlled processes. The misuse of these hypothetical constructs as actual processes tends to obscure the more central, underlying processes and mechanisms responsible for behavior change and learning (Gewirtz & Pelaez-Nogueras, 1996; Pelaez-Nogueras & Gewirtz, 1997).

The functional approach to behavioral development, on the other hand, uses stimulus-response methodology as an effective way directly to modify and measure behavior change. A functional behavioral-analytic approach assumes that "stimulus conditions can be manipulated" over the course of a person's life to "produce various outcomes" (Gewirtz, 1978). Events that have functional relations to behavior create an efficient approach for optimizing behavioral development.

BEHAVIORAL CUSPS

Conceptual Framework

Experimental research guided by the principles of behavior analysis shows that the notion of behavior cusps is a very important element in predicting and controlling human behavior. The concept of *cusps* was introduced by Rosales-Ruiz and Baer (1997) to describe changes in person-environment interactions that allow access to novel contingencies, which further influence an individual's repertoire (for extended discussion, see Bosch & Fuqua, 2001; Bosch & Hixson, 2004). A cusp marks a time when the expansion of the child's repertoire is likely to become explosive, and when the deliberate management of the child's behavior becomes pragmatically different from what it was before.

In less systematic terms, a developmental cusp is a special instance of change; whether it is a change in behavior, skill, ability, discrimination, perception, affect, or motivation, it is crucial to what should or can come next in development. A cusp is a change that is often difficult, tedious, subtle, or otherwise problematic to accomplish. If change is not made, little or no further development is possible, but once it is made, a significant set of subsequent changes suddenly become easy or otherwise highly probable. This may in turn bring the developing organism into contact with other cusps crucial to more, and possibly more complex, and more refined development in thereby steadily expanding, more interactive realms (Bijou & Ribes, 1996; Rosales-Ruiz & Baer, 1997).

The definition of cusp must be expanded; the concept of cusp always depends on the phrase “If that is of importance . . .” In biology, importance is related to functions that improve prospects for survival. In development, the survival value of a behavior or skill is less clear, so importance is very often socially determined. A cusp may open new environments for a child, and we may view what those new environments will produce as being important; but if we inquire, we often find that other people do not. As an example to explain the concept of cusps, Rosales-Ruiz and Baer (1997) use infants’ crawling. Acquiring this new skill allows the child to get to the toys and family members more easily and shapes the child’s further behavior. Reading is another example of behavioral cusp; it unlocks new pathways to a number of other developments. Ability to read and follow directions allows the person to access the Internet, purchase a ticket to an exotic destination, learn about a new culture, and so forth (Novak & Pelaez, 2004). Learning to cross the street is also an illustration of access to new environments and contingencies. Street crossing may allow access to the mall, the movie theater, or other new areas, thus opening environments that may support further behavioral changes. However, street crossing also exposes the child to the risk of injury or death in traffic and gives the child the ability to run away from home, so some adults might view this as an unimportant (undesirable) behavior to teach.

Organization of Cusps

Clearly, developmental cusps can be organized on at least two continua: (1) the difficulty of accomplishing the cusp and (2) the scope, magnitude, and value of the behavior changes and new opportunities that getting by the cusp enables. Both have obvious significance for development. Easy cusps are more likely to be achieved than difficult ones, and thus the changes they enable are more likely to occur; cusps that enable many wide-ranging subsequent behavior changes of great use in the person’s environment will be seen as more developmentally significant than cusps that enable few, highly similar changes of little use.

Thus, the time and difficulty of getting by a cusp have little relation to the scope and value of what it enables; quick, easy cusps can have large consequences, and long, difficult cusps can have small ones. All these parameters depend on context, and much of what is meant by context consists of what other cusps the person has passed. Sequence, both necessary and merely societal, can be essential to this concept of development, but it is the cusps that need to be analyzed first. As cusps are understood we would have a better understanding of when their sequences will also occur (Bijou & Ribes, 1996, p. 54).

Metaphorically speaking, cusps are often behavioral steps in an orderly path. Perhaps more typically, they are like the branches of a tree: They stem from an earlier branch or trunk, and new branches may stem from them, where their structure and the surrounding environment allow for it. But their final order, size, and number of branches are not predetermined.

Sensitive Periods versus Cusps

Contrasting with behavior cusps is the notion of *sensitive* or *critical periods*. The concept of critical and sensitive periods has often been invoked to justify age-related learning, training, or intervention (e.g., Bornstein, 1989). A critical period refers to a time span in the individual’s early life during which the capacity to acquire certain behavior systems

is assumed irreversibly lost if relevant experience (i.e., stimulation) is not provided. It has been assumed that, during critical and sensitive periods, relatively large or rapidly occurring behavioral effects can be produced by less environmental stimulation or fewer stimuli than would be required to produce such effects in other time segments. These time segments are often specified imprecisely (“around 6 months”) or broadly (“the last quarter of the first year”).

Any age-defined concept is limited in utility to the extent that it ignores the underlying processes. Research must focus on process, which requires a detailed analysis of the sequence of environment-organism interactions that lead to the developmental milestone. Once the processes through which cumulative experience affects behavior systems are examined, age-linked critical and sensitive periods lose even the modest precision their time limits suggest. Specifications of conditions that either prevent the acquisition of a behavior system or give it the appearance of irreversibility further impeach the utility of a critical-period concept. For instance, if the acquisition of incompatible responses is the factor preventing or impeding the acquisition of a particular behavior system (e.g., walking), then, in principle, techniques could be devised to eliminate these incompatible responses from the individual’s repertoire (e.g., crawling). In this case, the sensitive period for a unique time span of heightened or maximum susceptibility to particular environmental influences is similarly of questionable utility.

The individual is changing constantly due to experience and organismic factors, and therefore the capacity to learn varies throughout his/her life span (Pelaez-Nogueras, 1996). Further, even within a narrow segment of the life span, “the probability of learning at any moment may vary greatly as a function of diverse contextual-setting conditions” (Gewirtz, 1978, p. 13). The range of functional stimuli experienced often determines the characteristics of a child’s response systems. An analysis of changes in the controlling environment may explain more about the child’s development than an analysis focused only on the child’s readiness. A behavior analysis of development would examine the origins and changes in reinforcing stimuli as functions of the roles they play in behavior of the child in different contexts. In this analysis, examining the sequences of experiences and the role of reinforcing contingencies for that child is critical.

Typical versus Atypical Development

Cusps with their significant and far-reaching implications for further development can also be viewed as negative and undesirable. Reaching the age when an adolescent will face introduction to an addiction such as drugs or gambling is an example of a cusp about which most parents could be apprehensive and would not welcome. Inappropriate behaviors are those that have a negative impact on welfare, learning, and performance. For example, teaching a child to ask another person for an object that is out of reach may replace the inappropriate behavior of pointing at the object and crying. Chewing food with one’s mouth closed may be a cusp in certain social circles but may fail to qualify as a cusp with less socially refined friends or when eating alone.

For children labeled “normal,” many cusps are achieved and surmounted through their ordinary events in life. The children called “deviant” are often enough called this because they have not gone through some cusps crucial to what we call normalcy in their everyday experience. Thus, normal children get through cusps by extensive, intense teaching (often

via modeling, imitation, and spoken language), aided by various skills acquired through prior cusps that make them more skillful and better at self-teaching (e.g., self-regulation). Less fortunate, less endowed, and less well-taught children do not go through these cusps and become targets of diagnostic mislabeling (e.g., developmentally handicapped).

Antisocial behavior in elementary school children and their inability to follow directions and establish meaningful relationships with peers contribute to academic failure, peer rejection, and delinquency. Understanding the consequences of such a behavior is important, but what is crucial to understand is *how* this undesirable repertoire is learned.

Negative reinforcement of parents' behavior (e.g., giving in to avoid child's aversive nagging) often maintains the child's antisocial behavior. Also, inconsistent or harsh parental discipline, misplaced contingencies, and failure to monitor children's behavior are the key variables explaining how antisocial behavior is often shaped by parents. The child's antisocial repertoire results from learning (Patterson, DeBaryshe, & Ramsey, 1989). Teaching parents how to reinforce appropriate behavior while ignoring or punishing the misbehavior (i.e., using effective discipline strategies and changing their reaction to a child's antisocial behavior) often works very effectively. The child's antisocial behavior as well as other forms of problem behavior may be the direct result of a caregiver's misplaced reinforcing contingencies (e.g., attention).

There are several reasons that early experience during childhood may influence significantly the development of behavior patterns later in life. Some structural systems (underlying behavior systems) appear to require stimulus input to become functional. For example, consider that a physically developed eye may not be functional until it has been exposed to light. In a similar way, many other behavior systems of the organism depend directly on the previous acquisition of component systems. More specifically, a child must be able to hold a pencil or other writing implement and draw straight and curved lines before he or she can learn to print letters. In addition, certain later behavior systems would appear to be more effectively established when supported by behavior systems that are usually learned early in life and that can subsequently become the element of diverse response complexes and sequences, including those directed at people.

All these later behavior systems are often maintained by the same stimuli that maintained the earlier acquired responses, and, on this basis, behavior systems acquired early in life may become pervasive and may appear permanent and irreversible. Nevertheless, these systems would extinguish if the conditions and environmental consequences maintaining the behaviors were removed or eliminated. Thus, the strength of these behavior systems is often due not to their supposed irreversibility, but rather to the locking-in of the behavior of the environment with the child's behavior, so that from earliest acquisition onward the maintaining contingencies might not even appear to the untrained observer to be operating. Further, in this locking-in process, the appearance of irreversibility of some behavior systems could be due to the transfer of stimulus control from the initial sets of stimuli maintaining the response to a different set that, to the untrained observer, similarly might not appear to be operating. For example, a young person's appropriate grooming and dressing is initially established by verbal prompting, social reinforcement, and corrective feedback from the youth's parents. Later, however, it is maintained by the youth's appreciation of his or her own neat appearance and rare compliments from others, environmental stimuli that would be barely perceptible by an observer (Gewirtz, 1978).

BEHAVIOR-ANALYTIC APPROACH TO HUMAN DEVELOPMENT

A Practical Methodology

Much of the existing research in the field of psychology suggests that environmental stimuli affect behavior. This is reasonable because one of the distinguishing characteristics of living organisms is that they are all sentient beings. Further clarifying the relationship between environment and behavior, behavioral-analytic theory defines development as progressive changes in behavior shaped by consequences. These behaviors in turn combine and build on each other to become hierarchically organized (Pelaez-Nogueras & Gewirtz, 1997). Some people incorrectly believe that behavior analysis sees all behavior as respondent in nature, and therefore “automatic” and not influenced by its impact on the environment.

Behavior analysis differs from most psychological accounts of behavior. Assumed processes that involve stages and follow a linear, structural framework, lack “physical natural science realm” that includes “electrons, atoms, magnetism, cells, and so forth” (Sloane, 1992). Behavior analysis replaces mental entities and hypothetical phrasing with real-world interactions between a behavior and its environment. Once a social worker can observe and explain the behavioral changes under observation, then the practicality of our studying human behavior in the social environment can be understood and applied. However, many standard human behavior and the social environment (HBSE) textbooks still do not incorporate behavior analysis into their theory chapters. One rare exception can be found in Thyer (1992).

Developmental psychology tends to omit the significant empirical and theoretical contributions of behavior analysis to the scientific understanding of child behavior. This sizable literature includes, but is not limited to, notable work done by Donald M. Baer, Sidney W. Bijou, Jacob L. Gewirtz, Lewis P. Lipsitt, Martha Pelaez, and Carolyn Rovee-Collier and their respective colleagues. At the very least, this omission does a disservice to social workers studying HBSE by narrowing their understanding of valuable empirical and theoretical analyses of behavioral development across the life span (Gewirtz & Pelaez-Nogueras, 1992, 1993; Novak & Pelaez, 2002; Pelaez-Nogueras, 1996; Schlinger, 1992).

Behavior analysis is both a methodology for studying human development in the social environment and a proven technology for increasing intellectual abilities and teaching useful skills. Rather than trying to track the chronology of normal development, behavior-analytic researchers analyze how adaptive behaviors in various domains (e.g., socialization, language, academics, self-care) are learned. Behavior analysts define each behavior of interest in observable terms, investigate how these behaviors differentiate according to situational demands and connect to form complex performances, and examine how these responses are acquired under natural conditions. Frequently, behavior analysts design instructional procedures using antecedent stimuli (e.g., verbal instructions, modeling, manual guidance) to prompt the behavior and consequent stimuli (e.g., attention, verbal praise, access to desired activities) to positively reinforce and strengthen the behavior. To teach complex behavior chains (e.g., uttering a sentence, getting dressed), behaviors are taught one at a time and linked together in their proper sequence. After the first behavior is taught, the second behavior is prompted and reinforced to occur immediately following the first behavior; after the second behavior is taught, the third behavior is prompted and reinforced to occur

immediately after the second behavior. This process is continued until the entire behavior chain is assembled.

The effectiveness of these sorts of procedures is evaluated individually with each person studied, and instructional methods are revised and refined as needed until the educational goal is met or the person reaches an optimal level of performance. This methodology has been shown to be efficacious in teaching clients a wide range of sensory, cognitive, and motor skills regardless of their age and presumed developmental level and, more important, despite their prior history of exhibiting severe developmental disabilities. Thus, behavior analysis offers hope to clients whose development is delayed or halted, the very cases that most need social services and professional assistance. The applications of behavior analysis have been extensive (Iwata et al., 1997; Neef et al., 2004), so we give only a brief overview of one of these areas: language acquisition.

As discussed later in this chapter, language acquisition is crucial for social and intellectual growth, and it may be a primary behavior cusp (Novak & Pelaez, 2004). Behavior-analytic research has helped to clarify the distinction between two forms of communicative behavior: receptive language (e.g., pointing to the appropriate object after hearing its name) and productive language (e.g., correctly naming an object that has been presented). These two verbal repertoires may exist separately, develop at different rates, and require distinct instructional procedures (Guess, 1969; Guess, Sailor, Rutherford, & Baer, 1968).

The two previously mentioned studies also investigated parts of speech, in particular, use of the plural morpheme (e.g., cat/cats). After they had taught their client, a 10-year-old girl who met criteria for a diagnosis of severe mental retardation, multiple exemplars of the plural form, the client displayed generalized plural usage; that is, she used the correct plural form for words that were not included in the training sessions (e.g., said “cows” although the words “cow” and “cows” were not previously presented; Guess, 1969). Thus, early behavioral research has analyzed both the structure and function of language, and has done so in ways that can be applied to effective language instruction. These results have been replicated with other clients and expanded to teach more socially pragmatic language skills, such as question asking (Frisch & Schumaker, 1974; Haring, Roger, Lee, Breen, & Gaylord-Ross, 1986; Taylor & Harris, 1995; Twardosz & Baer, 1973; Williams, Pérez-González, & Vogt, 2003).

Incidental Teaching and Language

Another line of behavioral research has examined techniques for promoting language acquisition that can be readily integrated into the client’s daily routine. One of these procedures, incidental teaching, utilizes regular daily encounters in which verbal behavior might have heightened instrumental value, such as the start of playtime, when a child needs adult assistance in getting a particular toy (Hart & Risley, 1968, 1975). The types of verbal prompts or questions made prior to delivery of the desired item (e.g., “What do you want?” or “What do you want it for?”) and the terminal behavior required from the child (e.g., simple nouns, compound sentences) will determine what words the child learns and subsequently exhibits in these situations. Although these procedures were originally evaluated with children from low-income, African American families, they have also proven effective in teaching receptive object labels (e.g., “Give me the _____ [bread or apple]”) and expressive use of prepositions (e.g., “It is _____ [under or inside] the box”) to children with

autism and severely delayed language (McGee, Krantz, Mason, & McClannahan, 1983; McGee, Krantz, & McClannahan, 1985).

In sum, all of the successful applied research was based on the application of learning principles and the examination of social and environmental stimuli that could be manipulated to further students' linguistic and intellectual development. The students' chronological age, developmental age, and presumed developmental stage were de-emphasized in favor of searching for procedures that were effective in raising their current abilities. The pragmatism of and positive results obtained with behavior-analytic approaches are factors that encourage us to recommend them to social workers and other human service professionals interested in promoting human development.

Beyond Learning

The focus of the behavior-analytic approach has been termed merely "learning," not "development by those who favor age-correlated mainstream approaches (Gewirtz & Pelaez-Nogueras, 1996). On the contrary, behavior analysis offers many substantial criteria for providing scientifically sound theories on development. These criteria include accuracy, clarity, predictability, practicality, internal consistency, parsimony, testability, productivity, and self-satisfaction (Novak & Pelaez, 2004). Behavior analysis is applicable to many areas of life that involve observing relations between behavioral and environmental events (Schlinger, 1992).

The behavior analysis approach allows for prediction and control of human behavior. Its standards for research are closely related to those of the natural sciences of biology, physics, and chemistry and are applied in medicine and engineering. Because behavior-analytic theory fulfills the criteria of good scientific theories Schlinger (1992) posits that it may be able to offer more plausible interpretations of behavioral phenomena than most other traditional psychological theories. This has ramifications for professionals who design and apply social service programs. Their notions about human behavior and human development, which undergird their general models and individual practices, should be based on the best available scientific evidence. Because there is always room for improvement, it is imperative to openly discuss what theories have been used in the past and what theories should be used in the future. Behavior analysis is one such discipline to explore for improvement of existing programs.

APPLICATION TO SOCIAL WORK AND HOME AND FAMILY INTERVENTIONS

Instead of viewing human development as the unfolding of a series of predetermined stages, one can focus on elements of the social and physical environment that can stimulate the developing child's abilities and potential. This outward-directed approach seeks to identify and rearrange events that can either promote or hinder human development and is more readily applicable by human service professions such as social work. An example of work that isolates socioenvironmental variables in human development is the longitudinal research of Hart and Risley (1995).

Over a period spanning 2 years, Hart and Risley's team observed 42 families in their homes for 1 hour every month, recording the interactions between 1- and 3-year-old children and their parents. Thirteen of the families were upper socioeconomic status (SES), 23 were middle or lower SES, and 6 families were receiving welfare benefits. The families differed significantly in the quantity of language used in the home, as well as the type of feedback that they gave when the children attempted to explore the world around them.

Strikingly, it was shown that the upper SES ("professional") parents addressed considerably more words to their children than the middle or lower SES ("working-class") parents, and the middle or lower SES parents addressed substantially more words to their children than did the parents receiving welfare benefits. By the time the child was only 3 years old, these differential rates of verbal interaction were projected to result in the cumulative number of words addressed to children of the three SES groups differing by *tens of millions* of words. Words are used to distinguish between objects, to note variations in their qualities, and to convey abstract and complex relationships; the three groups of families showed significant variation in their use of these symbols that are the tools for such intellectual activity.

The three groups of families also differed greatly in the way parents responded to their children's efforts to interact with their surrounding environment. The professional parents were more than twice as likely as working-class parents and more than 4 *times* as likely as welfare parents to give encouragement to their children (saying "good" or listening to child's statements), that is, to be a source of positive reinforcement. Conversely, parents receiving welfare benefits were twice as likely as professional parents and working-class parents to discourage their children (saying "stop" or "shut up"), that is, to be a source of aversive consequences, or punishment. The cumulative effect of such early childhood experiences is foreseeable: Children of parents receiving welfare have less exposure to language and its ability to help make fine-grained distinctions or abstractions; they receive less confirmation that they are "good" or worthwhile individuals; and they get less urging to explore and learn about the world around them. Correlated with these variations in parent-child interaction patterns found by Hart and Risley (1995) was a very large difference in children's cumulative vocabulary. Because vocabulary size is associated with measures of intelligence and academic performance, from the beginning children from disadvantaged homes are on a developmental path with a trajectory for lower lifetime achievement.

Because Hart and Risley (1995) investigated socioenvironmental factors that were related to human development rather than hypothesized internal stages, they were able to recommend an early intervention program that could remediate the lower levels of stimulation observed in the welfare families of their study. This program was the Milwaukee Project, which enrolled infants from 6 to 8 weeks old in out-of-home, full-day child care, babies whose mothers who scored 75 or below on IQ tests. The mothers later received intensive in-home parent training, remedial education classes, and vocational training. Parent training included one-on-one coaching of parents in their homes to improve daily interactions in ways compatible with the parents' lifestyles. Results of the study showed that "children in the Milwaukee Project, unlike children from comparable families not enrolled in the project and unlike children in other less time-consuming intervention programs, were equal to the national average in accomplishments at age 8" (p. 206). Thus, by providing parents with educational and vocational opportunities and intensive parent training to modify parent-child interactions within the home, children of at-risk families could achieve normative levels

of performance by their early school years. By focusing on aspects of children's social and physical environment, behavioral researchers have been able to identify key factors related to children's intellectual development and to make specific recommendations for its betterment.

Behavior Analysis for Effective Intervention

Operant theory is particularly important in evidence-based social work practice because it is one of the few theories used in social work that is firmly based on empirical research. The principal tenet of operant theory is that individuals learn from the consequences of their behavior, with behavior being defined as everything the person does, including overt behavior as well as private events such as thoughts and feelings. Consequences are classified in terms of the behavior changes that follow them.

In its application to human problems, operant theory provides both assessment and intervention strategies for work with individuals, families, groups, communities, and organizations. The primary mode of assessment is analysis of contingencies apparently controlling behaviors of interest. An effort is made to determine connections between antecedents of a behavior, the behavior itself, and its consequences. Through such analysis of behavior and its antecedents and consequences, referred to as functional or contingency analysis, the social worker can "form [a] hypothesis about contingencies" maintaining problem behaviors and "seek to alter these contingencies" (Reid, 2004, p. 56).

Applications of operant theory in clinical practice have generated many approaches to producing behavior change. The most commonly used methods in clinical work are positive reinforcement, self-reinforcement, and contingency management. Operant theory also plays an important part in methods that use other learning principles (Baer & Rosales-Ruiz, 2003). For example, in social skills training, modeling is combined with reinforcement of desired behaviors by the trainer as well as by others in the client's environment.

Operant theory has enriched social work with an empirically based and testable approach to understanding and changing social problems at all levels of practice and has become part of a point of view and burgeoning technology that is remaking direct practice in social work (see Thyer, 1983, 1987, 1992; Thyer & Myers, 1997, 2000).

At a more specific level, operant theory and derivative methods have contributed several important concepts and principles to the core knowledge of the profession. The notion that positive reinforcement can be a powerful means of change is perhaps the most obvious addition. Social workers have become aware that reinforcers can take various forms and that they not only can foster desirable behavior but also can inadvertently maintain unwanted behavior. Social workers have also learned about the limitations of punishment as a means of change. More importantly, growing numbers of social workers have begun to apply contingency management methods (Baer & Rosales-Ruiz, 2003).

The contribution of operant theory to work with selected problems and populations can be demonstrated by the following methods that have been used, which show the breadth and variety of the contribution. Conduct disorders and emotional problems in adolescents have been treated with a point reinforcement system; alcoholism and addiction have been treated successfully by using contingency contracting between client and family members with reinforcement of alternative behavior; and school underachievement and classroom problem behavior have been treated with identification of antecedents,

self-monitoring of performance, self-administered reinforcement, parental reinforcement of academic performance through point systems, social skills training, and teacher use of contingency management (e.g., token economies, response cost, and time-out procedures). These are just a few of the areas that have utilized operant principles in practical applications.

These developments in basic and applied research and in theory building are laying the groundwork for new developments in operant methodologies and interventions. If operant theory moves in the directions suggested in this chapter, it should increasingly form links with other fields of activity, including experimental cognitive psychology, behavioral pharmacology, physiological psychology, and brain research. Eventually, one hopes for the development of a unified theory of behavior that would join together operant and respondent conditioning, cognitive-emotional phenomena, and biological processes. As Reid (2004, p. 56) has stated, "Although social work practice has been enriched by operant approaches as they have evolved, more is possible and more is certainly needed in a profession whose interventions are often no match for the problems they aim to resolve."

CONCLUSION

The evolution of behavior analysis into the HBSE curriculum will be of great utility for social workers. Avoiding theories and methods that do not have empirical support and that depend on hypothetical mental states to account for human development will encourage more precise and systematic scientific inquiry, which in turn should lead to a steady accumulation of well-grounded information on human development. Interventions based on this empirical foundation should be more effective and have more durable outcomes. As the awareness of the science of behavior analysis increases, interventions in the social service sector will also evolve.

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