

Positive Behavior Support:

Evolution of an Applied Science



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Abstract: Positive behavior support (PBS) is an applied science that uses educational and systems change methods (environmental redesign) to enhance quality of life and minimize problem behavior. PBS initially evolved within the field of developmental disabilities and emerged from three major sources: applied behavior analysis, the normalization/inclusion movement, and person-centered values. Although elements of PBS can be found in other approaches, its uniqueness lies in the fact that it integrates the following critical features into a cohesive whole: comprehensive lifestyle change, a lifespan perspective, ecological validity, stakeholder participation, social validity, systems change and multicomponent intervention, emphasis on prevention, flexibility in scientific practices, and multiple theoretical perspectives. These characteristics are likely to produce future evolution of PBS with respect to assessment practices, intervention strategies, training, and extension to new populations. The approach reflects a more general trend in the social sciences and education away from pathology-based models to a new positive model that stresses personal competence and environmental integrity.

The fourfold purpose of this article is to (a) provide a definition of the evolving applied science of positive behavior support (PBS); (b) describe the background sources from which PBS has emerged; (c) give an overview of the critical features that, collectively, differentiate PBS from other approaches; and (d) articulate a vision for the future of PBS.

Definition

PBS is an applied science that uses educational methods to expand an individual's behavior repertoire and systems

change methods to redesign an individual's living environment to first enhance the individual's quality of life and, second, to minimize his or her problem behavior (Carr, Horner, et al., 1999; Koegel, Koegel, & Dunlap, 1996). *Positive behavior* includes all those skills that increase the likelihood of success and personal satisfaction in normative academic, work, social, recreational, community, and family settings. Support encompasses all those educational methods that can be used to teach, strengthen, and expand positive behavior and all those systems change methods that can be used to increase opportunities for the display of

positive behavior. The primary goal of PBS is to help an individual change his or her lifestyle in a direction that gives all relevant stakeholders (e.g., teachers, employers, parents, friends, and the target person him- or herself) the opportunity to perceive and to enjoy an improved quality of life. An important but secondary goal of PBS is to render problem behavior irrelevant, inefficient, and ineffective by helping an individual achieve his or her goals in a socially acceptable manner, thus reducing, or eliminating altogether, episodes of problem behavior.

Background Sources Related to Philosophy and Practice

PBS emerged from three major sources: (a) applied behavior analysis, (b) the normalization/inclusion movement, and (c) person-centered values.

APPLIED BEHAVIOR ANALYSIS

Applied behavior analysis is the systematic extension of the principles of operant psychology to problems and issues of social importance (Baer, Wolf, & Risley, 1968). Were it not for the past 35 years of research in applied behavior analysis, PBS could not have come into existence. Applied behavior analysis has made two major contributions to PBS. First, it has provided one element of a conceptual framework relevant to behavior change. Second, and equally important, it has provided a number of assessment and intervention strategies.

PBS is indebted to applied behavior analysis for the notion of the three-term contingency (stimulus-response-reinforcing consequence), the concepts of setting event and establishing operations, and the notions of stimulus control, generalization, and maintenance (Chance, 1998; Miltenberger, 1997). These and other concepts have served as a critical springboard for the elaboration and development of PBS.

Functional analysis, an assessment strategy that originated in applied behavior analysis, is an experimental method for determining the motivation (purpose) of a variety of socially significant behaviors, thereby facilitating intervention planning designed to change behavior in a desirable direction (Carr, 1977; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982). The detailed elaboration of empirical methodologies, emphasizing the ongoing, direct measurement of behavior, is one of the enduring contributions of applied behavior analysis.

Applied behavior analysis helped develop educational methods such as shaping, fading, chaining, prompting, and reinforcement contingencies as well as a wide array of procedures for reducing problem behavior (Sulzer-Azaroff & Mayer, 1991). PBS has not only incorporated the elements of applied behavior analysis just described; it has

also evolved beyond the parent discipline to assume its own identity. This identity is strongly influenced by the realities of conducting research and intervention in natural community settings that necessitate changes in assessment methods, intervention strategies, and the definition of what constitutes a successful outcome (Carr, 1997). These themes are an important focus of this article.

NORMALIZATION/INCLUSION MOVEMENT

Philosophically, PBS subscribes to the principle and ideal of normalization, namely, that people with disabilities should live in the same settings as others and have access to the same opportunities as others (in terms of home, school, work, recreation, and social life). The principle of normalization rests, most critically, on the idea of social role valorization, namely, that the ultimate goal is to ensure that people who are in danger of being devalued are helped to assume valued social roles, thereby increasing the likelihood that they will be accorded respect from others and will receive an equitable share of existing resources (Wolfensberger, 1983).

The normalization principle leads naturally to the principle of inclusion. During the past 150 years, the United States has been characterized by an ever-increasing emphasis on the extension of individual rights to formally disenfranchised groups, thereby facilitating the inclusion of those groups in mainstream society. The upward inclusion trajectory began with the women's suffrage/women's rights movement that occurred from 1848 through 1920 (Buechler, 1990), continued with the civil rights movement of the late 1950s and early 1960s (Solomon, 1989), and has most recently focused on the movement emphasizing the rights of individuals with disabilities that evolved during the 1970s and 1980s (Gilhool, 1989). The inclusion movement for people with disabilities continues to this day. In the educational arena, it embodies the trend toward placing students with disabilities in general education classrooms (Bricker, 1995) as opposed to segregated, special education facilities and, most significantly, changing systems so that specialized school support becomes fully integrated and coordinated with the general education program in neighborhood schools (Sailor, 1996). Inclusion in normalized settings extends beyond education. For example, in the vocational sphere, it involves replacing sheltered workshops with supported employment. Inclusion also involves replacing group homes and other congregate facilities with supported living arrangements (in which one chooses one's housemates and the neighborhood in which one wishes to live) and replacing artificial social and recreational opportunities (e.g., social groups for people with disabilities) with those emphasizing participation with people who may not have disabilities (e.g., membership in religious groups, community gyms, and social and ethnic clubs).

PERSON-CENTERED VALUES

The PBS philosophy embraces the idea that while humanistic values should not replace empiricism, these values should inform empiricism. Science tells us *how* we can change things, but values tell us *what* is worth changing (Carr, 1996). Guided by this precept, PBS represents a melding of values and technology in that strategies are judged not only with respect to efficacy (a technological criterion) but also with respect to their ability to enhance personal dignity and opportunities for choice (a values criterion). Thus, the approach eschews the use of strategies that members of the community judge to be dehumanizing or degrading (Horner et al., 1990).

Three interrelated processes serve as the vehicle for implementing the values perspective just described: person-centered planning, self-determination, and the wrap-around approach.

Person-centered planning (Kincaid, 1996; O'Brien, Mount, & O'Brien, 1991; Smull & Harrison, 1992; Vandercook, York, & Forest, 1989) is a process for identifying goals and implementing intervention plans. It stands in sharp contrast to traditional program-centered planning, in which individuals with disabilities are provided with those preexisting services that a particular agency or institution has available. In person-centered planning, the specific needs and goals of the individual drive the creation of new service matrices that are carefully tailored to address the unique characteristics of the individual. Specific individual needs are considered within the context of normalization and inclusion, alluded to earlier, to produce an intervention plan that emphasizes community participation, meaningful social relationships, enhanced opportunities for choice, creation of roles that engender respect from others, and continued development of personal competencies.

Because person-centered planning seeks to empower individuals with disabilities, it almost invariably leads to a focus on the issue of *self-determination*. Self-determination is a multidimensional construct that includes but is not limited to process elements involving choice and decision making, problem solving, personal goal setting, self-management, self-instruction, and self-advocacy (Wehmeyer, 1999; Wehmeyer, Kelchner, & Richards, 1996). People with disabilities are often told what they can do, with whom they can do it, and where, when, and how they can do it. In contrast, enhancing the process of self-determination involves changing systems and redesigning environments with a view to minimizing external (often coercive) influences and making the person with disabilities the primary causal agent in his or her own life. The end point of this process can be an enhancement of lifestyle with respect to employment, living situation, friendships, and personal satisfaction (Bambara, Cole, & Koger, 1998;

Wehmeyer & Schwartz, 1997). These outcomes represent some of the defining features of PBS discussed later in this article.

Recently, discussion in the literature has concerned the rapidly accelerating convergence between the core philosophy and methods represented by PBS and a process referred to as *wraparound* (Clark & Hieneman, 1999). Wraparound incorporates person-centered planning in its emphasis on developing support plans that are needs-driven rather than service-driven. Ultimately, such planning has an impact on the entire family system. The approach is buttressed by flexible, noncategorical funding. Wraparound also incorporates a self-determination philosophy in its reliance on a support team whose membership is balanced between experts on the one hand and the individual with disabilities, family members, and advocates on the other, all of whom help identify and act on the individual's needs with a view to empowering that individual (Eber, 1997; VanDenBerg & Grealish, 1998). It reflects person-centered values in its emphasis on assessing strengths rather than deficits and problems. The approach focuses on meeting a person's needs in critical life domain areas such as family, living situation, financial, educational/vocational, social/recreational, behavioral/emotional, psychological, health, legal, cultural, and safety (VanDenBerg & Grealish, 1998). The guiding hypothesis is that if an individual's needs are met, then quality of life will improve, and problem behavior will be reduced or eliminated altogether. This hypothesis, of course, is also one of the defining assumptions behind positive behavior support.

Critical Features

The background sources related to the philosophy and practice of PBS have helped create an evolving applied science whose critical features, collectively, differentiate it from other approaches. As noted, some of these features can be found in other approaches as well and have been scattered throughout the literature of the past 15 years. However, what makes PBS unique is its emphasis on integrating, into a cohesive whole, the nine characteristics described next.

COMPREHENSIVE LIFESTYLE CHANGE AND QUALITY OF LIFE

The sine qua non of PBS is its focus on assisting individuals to achieve comprehensive lifestyle change with a view to improving quality of life not only for persons with disabilities but also for those who support them. When applied to larger organizational units such as schools (Sugai et al., 2000), the focus of PBS is on assisting the unit to achieve broad changes that facilitate more positive outcomes for all participants. In this light, the reduction of challenging be-

aviors per se is viewed as an important secondary goal that is of value principally because of its facilitative effect on producing meaningful lifestyle and cultural changes that are stable and enduring.

A truly comprehensive approach to lifestyle change addresses the multiple dimensions that define quality of life (Hughes, Hwang, Kim, Eisenman, & Killian, 1995), which include improvements in social relationships (e.g., friendship formation), personal satisfaction (e.g., self-confidence, happiness), employment (e.g., productivity, job prestige, good job match), self-determination (e.g., personal control, choice of living arrangements, independence), recreation and leisure (e.g., adequate opportunities, good quality of activities), community adjustment (e.g., domestic skills, survival skills), and community integration (e.g., mobility, opportunities for participation in community activities, school inclusion). Although not every intervention attempted need be comprehensive, the cumulative impact of many interventions over time should be.

In sum, the definition of outcome success now emphasizes improvements in family life, jobs, community inclusion, supported living, expanding social relationships, and personal satisfaction and de-emphasizes the focus on problem behavior (Risley, 1996; Ruef, Turnbull, Turnbull, & Poston, 1999; Turnbull & Ruef, 1997). The important units of analysis concern the person's daily routines, schedules, and social interactions. Problem behavior is of note to the extent that it interferes with achieving positive results with respect to these molar variables. However, the primary intervention strategy involves rearranging the environment to enhance lifestyle and improve quality of life rather than operating directly on reducing problem behavior per se.

LIFE SPAN PERSPECTIVE

Comprehensive lifestyle change does not typically occur within a compressed time frame. Therefore, another critical feature of PBS is that it has a life span perspective. Efforts to achieve meaningful change often take years (Nickels, 1996; Turnbull & Turnbull, 1999). Successfully assisting an individual to make transitions from preschool to elementary and high school, and then to the workplace and supported living, requires a life span perspective, which views intervention as a never-ending systemic process that evolves as different challenges arise during different stages of life (Turnbull, 1988; Vandercook et al., 1989). When one follows an individual over many years in changing life circumstances, deficient environments and deficient adaptive skills will almost certainly continue to emerge and be identified. Therefore, new PBS strategies may have to be added and old ones modified. With few exceptions, most research published to date has been characterized by short-term ap-

proaches (Carr, Horner, et al., 1999). Further, maintenance has often been defined as durable success following intervention cessation (Carr et al., 1990). Yet, as noted, in a truly comprehensive PBS approach, intervention never ends and follow-up is measured in decades, not months. In sum, a life span perspective has become the new standard for maintenance, a fact that is evident in person-centered planning approaches that address the individual's needs and challenges over a period of many years (Kincaid, 1996; Turnbull & Turnbull, 1999; Vandercook et al., 1989).

The focus on comprehensive lifestyle change and life span perspective leads to three additional important features of PBS: ecological validity, stakeholder participation, and social validity.

ECOLOGICAL VALIDITY

Much previous research has focused on the microanalysis of cause-and-effect processes in analog situations, that is, on issues related to internal validity. Although it is true that there is no viable science without internal validity, it is equally true that there is no viable practice without external validity. PBS is not intended to be a laboratory-based demonstration or analog but, rather, a strategy for dealing with quality-of-life issues in natural community contexts. Although there is a continuing emphasis on issues related to internal validity, the main focus of the PBS approach concerns how applicable the science is to real-life settings, in other words, its ecological validity (Dunlap, Fox, Vaughn, Bucy, & Clarke, 1997; Meyer & Evans, 1993).

Internal validity is best demonstrated in situations in which one is able to enhance experimental control. Frequently, these situations are characterized by the involvement of atypical intervention agents such as researchers and psychologists (i.e., intervention agents who would not normally be expected to be the primary support people in community settings), working in atypical settings such as clinics and institutions, carrying out brief intervention sessions that often last only 10 to 15 minutes, in highly circumscribed venues (e.g., only one situation out of the many that may be associated with behavior challenges; Carr, Horner, et al., 1999). However, this approach is inconsistent with the PBS emphasis on normalization and inclusion in natural community contexts. Therefore, PBS entails balancing a concern with internal validity with the realities of conducting research and practice in complex naturalistic contexts in order to achieve ecological validity as well. Thus, the evolution of PBS is toward an approach that involves typical intervention agents (e.g., parents, teachers, job coaches) supporting individuals in typical settings (e.g., the home, the neighborhood, the school, the workplace) for protracted periods of time in all relevant venues (and not just those that lend themselves to good ex-

perimental control). This constellation of features defines the ecological validity dimension of PBS.

STAKEHOLDER PARTICIPATION

Traditionally, the field has embraced models of assessment and intervention that have been expert-driven rather than consumer-driven. Thus, behavior analysts, for example, have functioned as experts, defining the issues, selecting and designing interventions, and enlisting the aid of consumers (e.g., parents and teachers) in implementing strategies. The PBS approach, in contrast, has emphasized that consumers are not helpers but, rather, function as active participants and collaborators with professionals in a process of reciprocal information exchange. All members of the support team who are relevant stakeholders (e.g., parents, siblings, neighbors, teachers, job coaches, friends, roommates, and the person with disabilities) participate as partners to build the vision, methods, and success criteria pertinent to defining quality of life for everyone concerned.

This type of collaboration between professionals, researchers, and stakeholders has been called for by policymakers for many years (Lloyd, Weintraub, & Safer, 1997; Malouf & Schiller, 1995). Recently, such thinking has led to an increased emphasis on the notion of partnerships (Meyer, Park, Grenot-Scheyer, Schwartz, & Harry, 1998; Turnbull, Friesen, & Ramirez, 1998) and has produced a model that views researchers, professionals, and stakeholders as collaborators (Browder, 1997; Lawson & Sailor, in press; Nietupski, Hamre-Nietupski, Curtin, & Shrikanth, 1997; Reichle, 1997; Sailor, in press). Thus, the detailed knowledge that families have of the strengths, needs, and challenges of the person with disabilities becomes the cornerstone for collaborative planning, which yields a program of comprehensive family support (Albin, Lucyshyn, Horner, & Flannery, 1996; Lucyshyn, Albin, & Nixon, 1997; Turnbull & Turnbull, 1999; Vaughn, Dunlap, Fox, Clarke, & Bucy, 1997). Likewise, this model has been extended to other stakeholders such as job coaches and other employees at worksites (Park, Gonsier-Gerdin, Hoffman, Whaley, & Yount, 1998) as well as teachers and administrators in neighborhood schools (Salisbury, Wilson, & Palombaro, 1998).

In sum, stakeholders have evolved from a passive role in which they are instructed by an expert, to an active role in which they (a) provide valuable qualitative perspectives for assessment purposes; (b) determine whether proposed intervention strategies are relevant for all the challenging situations that need to be dealt with; (c) evaluate whether the approach taken is practical in that it meshes well (Albin et al., 1996) with the values, needs, and organizational structures related to the individual with disabilities and his or her support network; and (d) define what outcomes are

likely to improve the general quality of life and enhance the individual's personal satisfaction. An egalitarian approach toward stakeholder participation has become a normative feature of PBS.

SOCIAL VALIDITY

Long ago, applied behavior analysts rejected the idea that interventions ought to be evaluated solely in terms of their objective effectiveness (Wolf, 1978). This notion has been taken up by PBS practitioners and amplified (Carr, Horner, et al., 1999). Specifically, there is an understanding that interventions should also be evaluated in terms of their practicality (e.g., Can typical support people carry out the strategy?), their desirability (e.g., Do typical support people perceive the interventions to be worthy of implementation?), their goodness of fit (e.g., Do stakeholders agree that the strategies are appropriate for the specific context in which they are to be implemented?), their subjective effectiveness with respect to problem behavior (e.g., Do the relevant stakeholders perceive that the problem behavior has been reduced to an acceptable level?), and their subjective effectiveness with respect to quality of life (e.g., Do relevant stakeholders perceive the strategies implemented to have made a meaningful difference in the lifestyle of the individual involved in terms of increasing opportunities to live, work, go to school, recreate, and socialize with typical peers and significant others in typical community settings?).

A synthesis of the experimental literature published between 1985 and 1996 (Carr, Horner, et al., 1999) indicated that these criteria for social validity have not been a prime focus for applied behavior analysis investigators until recently. Not surprisingly, then, there has been, among those committed to a PBS approach, a growing movement emphasizing the centrality of social validity in the design and implementation of service provision and remediation efforts (Dennis, Williams, Giangreco, & Cloninger, 1993; Hughes et al., 1995; Risley, 1996; Sands, Kozleski, & Goodwin, 1991; Schalock, 1990, 1996; Turnbull & Turnbull, 1999). The movement toward social validity is, of course, one logical consequence of the PBS focus on lifestyle change, life span perspective, ecological validity, and stakeholder participation already discussed.

SYSTEMS CHANGE AND MULTICOMPONENT INTERVENTION

One of the central messages of PBS is that, in providing support, we should focus our efforts on fixing problem contexts, not problem behavior. Behavior change is not simply the result of applying specific techniques to specific challenges. The best technology will fail if it is applied in an uncooperative or disorganized context. This principle has

made efforts at systems change one of the defining features of PBS.

Meaningful change is possible only if systems are restructured in a manner that enables change to occur and be sustained. It is necessary that stakeholders share a common vision, that support persons be adequately trained, that incentives be in place to motivate people to alter their approach to problem solving, that resources (temporal, physical, and human) be made available to facilitate change, and that an action plan be created that defines roles, responsibilities, monitoring, and methods to be used to correct new or ongoing deficiencies (Knoster, Villa, & Thousand, 2000).

A systemic perspective rejects the notion that practitioner effectiveness depends solely on identifying a key critical intervention that can turn the tide. For decades, applied behavior analysts have prided themselves on the publication of many successful research demonstrations that involve the application of single interventions. These demonstrations have made for great science but ineffective practice. A comprehensive approach involving multicomponent intervention is necessary to change the many facets of an individual's living context that are problematic (Horner & Carr, 1997). This conclusion was rendered inevitable by the incontrovertible evidence provided by applied behavior analysis that, for any given individual, behavior challenges are likely to be dependent on multiple functional and structural variables whose influence demands a multidimensional remediation strategy built on the assessment information (Bambara & Knoster, 1998; Carr, Carlson, Langdon, Magito McLaughlin, & Yarbrough, 1998; O'Neill et al., 1997). This multicomponent, systems change perspective is very much in evidence throughout the PBS field, whether it be in the home (Clarke, Dunlap, & Vaughn, 1999; Koegel, Koegel, Kellegher, & Mullen, 1996; Turnbull & Turnbull, 1999), school (Sailor, 1996), workplace (Kemp & Carr, 1995), or community (Anderson, Russo, Dunlap, & Albin, 1996; Carr & Carlson, 1993; Carr, Levin, et al., 1999).

EMPHASIS ON PREVENTION

The PBS approach has helped give birth to what is, arguably, one of the greatest paradoxes in the field of developmental disabilities, namely, the notion that the best time to intervene on problem behavior is when the behavior is not occurring. Intervention takes place in the absence of problem behavior so that such behavior can be prevented from occurring again. The proactive nature of PBS stands in sharp contrast to traditional approaches, which have emphasized the use of aversive procedures that address problem behaviors with reactive, crisis-driven strategies (Carr, Robinson, & Palumbo, 1990).

The political context for the emphasis on prevention that characterizes PBS comes from legislation such as the Individuals with Disabilities Act (IDEA; 1997), which makes prevention and early intervention high priorities for professionals who deal with serious behavior challenges. This issue is part of a larger debate concerning how best to conceptualize approaches to prevention (Albee, 1996, 1998). The methodological context for the emphasis on prevention is inherent in the definition of PBS given at the beginning of this article, namely, that the approach focuses on skill building and environmental design as the two vehicles for producing desirable change.

The proactive skill-building aspect of PBS is seen, for example, in strategies that seek to prevent the recurrence of problem behavior by strengthening communicative competence (e.g., Carr & Durand, 1985) and self-management skills (e.g., Gardner, Cole, Berry, & Nowinski, 1983; Koegel, Koegel, Hurley, & Frea, 1992). The proactive environmental design aspect of PBS is seen, for example, in strategies that seek to prevent the recurrence of problem behavior by enhancing opportunities for choice making (e.g., Dunlap et al., 1994), modifying the setting events that alter the valence of reinforcers for significant behaviors (e.g., Horner, Day, & Day, 1997), and restructuring curricula (e.g., Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991). Indeed, the focus on environmental design as a proactive strategy follows logically from the systems change aspect of PBS discussed earlier. Specifically, staff development, provision of incentives, resource allocation, and construction of action plans represent systemic variables whose design and implementation take place not at the moment that problem behavior is occurring but rather in a coordinated proactive fashion intended to minimize the likelihood of future episodes of problem behavior.

FLEXIBILITY WITH RESPECT TO SCIENTIFIC PRACTICES

The main tradition from which PBS emerged is applied behavior analysis. That tradition has embraced the idea that the gold standard for research methodology is the experiment and that the data of greatest import are those derived from direct observation (Baer, Wolf, & Risley, 1987). Yet, that same tradition has spawned thoughtful discussion as to whether the demonstration of causality through repeated manipulation of independent variables across time is the only acceptable methodology, or whether methods involving correlational analyses, naturalistic observations, and case studies might also produce useful and important information (Risley, 1999). Likewise, there has been a call for researchers to adopt greater flexibility in their definition of what constitutes acceptable data, moving the discussion beyond the parameters of direct observation to consider the acceptability of qualitative data, ratings, in-

terviews, questionnaires, logs, and self-report (Schwartz & Olswang, 1996).

By adhering rigidly to laboratory-based criteria of excellence, we are in danger of putting ourselves in the position of learning more and more about less and less. That is, we run the risk of addressing only those topics that readily lend themselves to our preferred investigational techniques, ignoring other topics that prove too messy or ambiguous (Kunkel, 1987; Risley, 1999). As we move our research from more controlled situations such as laboratories, clinics, and institutional settings to less controlled situations such as community-based schools, homes, and job sites, it becomes apparent that both pragmatic and validity concerns demand flexibility in scientific practices.

One pragmatic concern involves the issue of assessment. Exemplary assessment has often been equated with functional analysis, an approach involving the experimental manipulation of putatively critical variables with a view to identifying those factors responsible for controlling the behaviors of interest. Although functional analysis has proven to be a powerful and elegant tool for demonstrating causal relationships, it has most often been used by atypical intervention agents (e.g., researchers) operating in atypical settings (e.g., institutions) in highly circumscribed venues over short periods of time (Carr, Horner, et al., 1999). A recent survey of 300 practitioners noted that more informal assessment procedures, including many that are not based on direct observation, were the methods of choice; functional analysis was used by only a small minority of the study sample (Desrochers, Hile, & Williams-Moseley, 1997). Practitioners felt that an inability to control complex naturalistic variables and insufficient time to conduct elaborate assessments made functional analysis an impractical and, therefore, seldom used method in community settings. The lack of feasibility is particularly striking when one considers that the comprehensive assessment of problem behavior for even a few individuals living in the community often identifies hundreds of situations associated with diverse behavior challenges (Carr et al., 1994). A detailed functional analysis of all relevant situations would, in this case, be not just daunting but impossible. Further, conducting even a small number of functional analyses in the community is often not possible because of ethical considerations. For example, one could not manipulate variables in a supermarket in order to study the frequency with which an individual destroys property and attacks other customers.

Validity concerns arise from the issue of intervention. From a purely scientific perspective, the ideal intervention experiment is one in which a single variable is manipulated and all others are held constant. This methodology allows one to ascribe causality to the single variable being manipulated. In contrast, if several variables were to be manipulated at the same time, the experiment would be

inconclusive due to confounds. There is in fact a wealth of literature demonstrating the causal impact of single interventions. While such information is useful in the initial development of a science, an exclusive reliance on pure experimentation impedes application. Specifically, in the community, one must deal with multiple interacting variables embedded in complex systems. That is why PBS intervention is almost always multicomponent in nature (e.g., Carr, Horner, et al., 1999; Horner et al., 1996; Vaughn et al., 1997). The irony is that if one adheres strictly to laboratory criteria of excellence, then what is considered to be optimal practice (multicomponent intervention) is bad science (a confounded demonstration); if one adheres strictly to pragmatic criteria of excellence, then what is considered optimal science (single variable intervention) is bad practice. A rational approach to this dilemma is to recognize that both laboratory and pragmatic criteria must be part of a truly applied science. Scientific practices must be varied and flexible enough to accommodate the analysis of pragmatic effectiveness (by studying multicomponent interventions) and the analysis of causal mechanisms and basic processes (through single variable experimentation or studies that systematically dismantle intervention packages into their components).

In sum, PBS has evolved into a science that respects the realities of conducting research in complex community settings while incorporating the fruits of research conducted within the tradition represented by formal experimentation. For this reason, PBS research methodology is flexible in encouraging correlational analyses, naturalistic observations, and case studies in addition to experiments. Likewise, the PBS definition of acceptable data includes qualitative measures, ratings, interviews, questionnaires, logs, and self-report in addition to direct observation. The type of data may vary but the expectation remains that a systematic data source will be used to evaluate and guide intervention.

MULTIPLE THEORETICAL PERSPECTIVES

As noted earlier, applied behavior analysis and its accompanying operant conceptual framework have played a major role in shaping the development of PBS. However, as PBS has continued to evolve, it has drawn, increasingly, on other theoretical perspectives as well.

The strongly interrelated fields of systems analysis, ecological psychology, environmental psychology, and community psychology have made significant contributions to PBS. Strikingly, at a conceptual level, the ecological paradigm is isomorphic with PBS in several respects: It deals with units larger than the individual (i.e., systems), it emphasizes natural settings rather than institutions or clinics as being most appropriate for carrying out research and intervention studies (i.e., it emphasizes ecological va-

lidity), and it views research as comprising an ongoing collaboration between scientists and stakeholders. The confluence of these ideas has led to three theoretical principles that have long characterized community psychology and the related fields referred to earlier (Levine & Perkins, 1987), principles that have now become dominant motifs within PBS as well.

The first principle embodies the idea that since people in community settings are interdependent, clinically significant change occurs in social systems and not just in individuals. This notion, a major theme in ecological systems theory (Bronfenbrenner, 1989), manifests itself in PBS with the idea that the focus of intervention must be on changing problem context, not problem behavior. We must move beyond blaming the victim (e.g., certain people have problems that must be "treated") to holding societal contexts accountable (e.g., certain people live in deficient environments that must be redesigned). The second principle embodies the idea that producing change is not simply a matter of implementing specific techniques; rather, change involves the reallocation of resources such as time, money, and political power. Thus, administrative support, interagency collaboration, funding mechanisms, and commonality of mission philosophy are critical variables in the change equation (Dunlap et al., 2000; Knoster et al., 2000; Sailor, 1996). The third principle embodies the idea that an individual's behavior, appropriate or inappropriate, is the result of a continuous process of adaptation reflecting the interface between competence (a property of individuals) and context (a property of environments). Therefore, a successful intervention must modulate the goodness of fit between competence and context (see Albin et al., 1996, for a recent formulation of this idea). This goal is achievable by promoting skill development (a competence variable) in an integrated fashion with environmental redesign (a context variable). Exemplary intervention must involve multicomponent systems change, which, as noted earlier, constitutes the heart of PBS.

Another important aspect of systems change theory relates to the fact that many societies, including our own, are multicultural in nature. Family systems, for example, are characterized by considerable cultural heterogeneity. Effectiveness of community-based research and services therefore depends on knowledge of this heterogeneity. Thus, adherents of PBS have welcomed and are influenced by the theoretical perspectives inherent in cultural psychology, anthropology, and sociology. Cultural variables can have a profound influence on values, communication, interpersonal behavior, and social perception (Matsumoto, 1996). If one is not knowledgeable about these influences and sensitive to them, then the most well-intentioned and best-designed interventions may nonetheless fail. Although no culture is totally homogeneous with respect to goals, every culture deems certain goals to be normative and de-

sirable. In illustration, for many who work with families, a common goal is to make a child autonomous and self-reliant. This choice of goals reflects the premium that Western cultures place on independence. In contrast, many Asian cultures (e.g., the Japanese culture) place a premium on interdependence, that is, on belongingness, dependency, and reciprocity (Weisz, Rothbaum, & Blackburn, 1984); an emphasis on autonomy and self-reliance per se is seen as a sign of selfishness and immaturity. Also, in Western culture, seeking help for social and emotional problems is seen as rational and constructive, whereas in traditional Chinese culture, it is seen as shameful; only when problems are somaticized (e.g., "his strange behavior reflects an underlying 'liver' problem") is it permissible to seek help (Kleinman, 1980). These two examples make clear that cultural insensitivity on the part of intervention agents would likely produce noncompliance or outright avoidance if Asian families were involved. For this reason, attention must be paid to assessing, from a cultural perspective, differences pertaining to family structure and childrearing practices, family perceptions and attitudes, and language and communication styles (Lynch, 1998). In sum, the systemic, community-based, multicultural aspects of PBS lead naturally to a consideration of multiple theoretical perspectives that, in turn, guide the continued evolution of this approach.

A Vision of the Future

The continued evolution of PBS along the lines that we have discussed is likely to lead to substantive changes in at least four areas: (a) assessment practices, (b) intervention strategies, (c) training, and (d) extension to new populations.

ASSESSMENT PRACTICES

The focus on quality-of-life issues, life span perspectives, stakeholder participation, and systems change necessitates a greater reliance on alternative approaches to assessment. The traditional approach to assessment has tended to be microanalytic in nature, emphasizing the analysis of the effects of specific antecedent and consequent stimuli on discrete topographies of behavior. Current developments within PBS suggest that although the microanalytic approach will be retained, a greater emphasis will be placed on an emerging macroanalytic approach that relies on focus groups, expansion of the unit of analysis, evolution of user-friendly measures, and delineation of molar dependent variables.

Since PBS is community based, the relevant stakeholder constituency is diverse and includes not only practitioners but also administrators, policymakers, families, friends, individuals with disabilities, and teachers. There-

fore, focus groups and other sources of multiperspective, narrative-discursive data are needed to assess and identify the full array of stakeholder priorities, the structural and organizational barriers to success, feasibility of proposed solutions, and effective packaging of change strategies (Ruef et al., 1999). This systemic approach to assessment moves the field beyond a sole consideration of discrete behaviors to a consideration of what interested parties have to say about their vision and values, incentives for problem solving, resource allocation, and the infrastructure of available supports (Knoster et al., 2000). Discursive-narrative methodologies are inherent in both the personal futures planning and wraparound approaches discussed earlier (e.g., Kincaid, 1996; Eber, 1997), and it is likely that these approaches to the assessment of personal as well as systemic needs will become preferred and more prevalent in the future.

The systems orientation of PBS is another factor leading to changes in assessment practices. Specifically, the traditional emphasis on the behavior of individuals as the unit of analysis is being broadened to include larger units. This movement reflects greater sensitivity to issues that have long been the concern of professionals in the fields of school and educational psychology. For example, in schools, adherents of PBS have expanded the unit of analysis to capture group behavior at the level of entire classrooms and, even further, at the level of entire buildings (Lewis & Sugai, 1999; Sugai et al., 2000; Warren et al., in press). In taking PBS "to scale," researchers and practitioners are attempting to address the practical realities of carrying out assessment at a systemwide level, often involving hundreds, and sometimes thousands, of children. In this context, it is not possible to study behavior, one child at a time, using traditional assessment strategies. Thus, the development of assessment tools that measure changes in these expanded units of analysis is an important future direction for the field.

Because PBS involves the participation of diverse stakeholders who must function in complex community systems, traditional assessments involving the use of formal functional analysis are generally not workable. We articulated this point earlier, in the discussion of flexibility in scientific practices, and noted the ever-increasing reliance of practitioners on qualitative measures, ratings, interviews, questionnaires, and the like. An important issue for the future of PBS is whether these diverse assessment measures have a degree of validity that permits effective intervention planning. Some recent data (Yarbrough & Carr, 2000) suggested that identifying the parameters within which user-friendly assessments, such as those based on interviews, for example, show convergent validity with more formal assessments, such as those based on functional analysis, is a complicated issue that the field will have to address. We need to develop a set of decision rules and procedures for

determining when user-friendly, pragmatic assessment tools are valid and can therefore be employed by practitioners who do not have the time, the control, or perhaps even the training to carry out experimental (functional) analyses. PBS will only reach its full potential when new assessment tools are developed that do not depend on the availability of a small group of highly trained and often unavailable experts.

Finally, the emphasis of PBS on quality-of-life issues and life span perspectives requires that the scope of assessment be expanded to include molar dependent variables (Carr et al., 1998). Traditionally, the main focus has been on causal analyses involving the influence of discrete antecedent and consequent stimuli on well-defined, temporally circumscribed units of behavior. The PBS focus not only includes this type of analysis but also includes assessments related to the influence of broad contextual variables operating over protracted periods of time. Therefore, molar assessments must be developed to capture the effects of systemic changes related to friendship networks (e.g., sociometric analysis), vocational placement (e.g., work productivity, work satisfaction), living environments (e.g., autonomy, self-determination), educational arrangements (e.g., social acceptance, self-esteem, academic competence), and leisure situations (e.g., consumer satisfaction). The use of assessment strategies related to molar dependent variables is essential if we are to fully understand the impact of systems changes on quality of life over time.

In sum, the future is likely to see changes with respect to the who, where, how, and what of assessment: who (e.g., focus groups and key stakeholders, not just experts, will play an increasing role), where (e.g., schoolwide settings, not just individual tutorial situations), how (e.g., user-friendly indirect assessments, not just formal experimental analyses), and what (e.g., sociometric analysis, not just discrete social behaviors).

INTERVENTION STRATEGIES

Because intervention is linked directly to assessment within the PBS framework, there will also be changes in the who, where, what, and when of intervention. With respect to "who," for more than three decades, researchers, psychologists, and other experts have implemented intervention. Yet, the PBS emphasis on ecological validity necessitates a movement toward natural supports in the community, that is, typical intervention agents. Although the recent increase in the involvement of parents and teachers represents a constructive step in this direction, it is not enough. Most people have a broad network of social supports that includes siblings, friends, grandparents, neighbors, and others whose involvement in intervention has rarely been tapped. The participation of this extended

circle of people as active intervention agents in socially supportive roles is likely to become an important feature of PBS.

With respect to "where," the traditional approach has emphasized laboratory, clinic, and segregated institutional settings. Again, however, ecological validity concerns are pressing the field of PBS to carry out interventions in naturalistic, community-based settings. Home, school, and workplace represent a good beginning, but they constitute only a small portion of the universe of possibilities. The future will see the extension of this approach to settings that most of us experience, including restaurants, movie theaters, sports venues, churches and synagogues, social clubs, and vacation places. Expanding the variety and breadth of intervention agents and settings will be a sign that PBS has matured to the highest level of ecological validity.

The focus on comprehensive lifestyle change and quality-of-life issues will drive the field toward a reconceptualization of the "what" of intervention. Thus, in the past, the question has often been, "What intervention (singular) is most appropriate for dealing with a particular problem?" It has become clear, however, that the multidimensional nature of quality of life requires, in turn, a multicomponent (plural) approach to intervention. Further, the components are not necessarily discrete intervention procedures in the traditional sense. For example, extinction (a discrete procedure) may be one component; however, environmental redesign, including architectural variables, social systems, sequences of daily routines, respite care, resource allocation, and development of support networks, may also be involved even though they are not the type of discrete intervention variables that have dominated the field for many years. There will be a greater concentration of effort designed to identify these molar variables and create decision rules regarding how best to combine multiple components into a comprehensive package that addresses the needs of people with disabilities as well as their families and friends.

The PBS focus on prevention will also influence the "when" of intervention. As noted, PBS is an approach in which intervention and support strategies are implemented in a proactive fashion with a view to reducing future occurrences of behavior challenges. Recently, for example, functional communication training has been used with young children to prevent the emergence of serious problem behavior (Reeve & Carr, 2000). There is a clear need to extend this type of demonstration. Specifically, we should be able to identify, early on, the multiple deficiencies in skills and environments that eventually lead to problem behavior and result in a poor quality of life. When these risk factors are better explicated, we will be in a position to teach carefully selected and delineated skills as well as to design living environments proactively before any behavior challenges manifest themselves. In this manner, the di-

rection of the field will be changed from its traditional focus on problems and difficulties to a new positive focus on building on an individual's strengths and creating living environments that support a high quality of life.

TRAINING

Several critical features of the PBS approach ensure that there will be innovations in the who, where, and what of training. There is likely to be continued movement away from an emphasis on simply training experts in university settings who subsequently go out into the field to instruct others. Instead, there will be a movement toward training interprofessional teams, often including parents, that reflects the PBS focus on stakeholder participation. At one level, this trend will involve a collaborative relationship between expert professionals on the one hand and parents, teachers, residential and work support staff, and childcare providers on the other. Collaboration will occur with respect to case formulation, goal setting, intervention selection, and ongoing programmatic change made within a collegial and egalitarian model of operation that would eventually extend to administrative staff and, ultimately, lead to interagency collaboration (Anderson et al., 1996). Thus, training will be viewed not simply as a transfer of strategic information from experts to providers but rather as a process of mutual education involving capacity building that ultimately results in systems change as opposed to narrowly defined changes for a particular individual.

The future should see a de-emphasis on lecture formats carried out within the confines of university settings and formal workshops, and a greater emphasis on on-site education. That is, the PBS emphasis on ecological validity will require that the training of professionals, families, and direct service providers take place in typical settings in neighborhood schools, work sites, community residences, and other locations in the community (e.g., restaurants, shopping malls, theaters). Meaningful training involves *in vivo* problem solving within real-life contexts occurring for time durations sufficient to produce trainee competence (Anderson et al., 1996). It is likely that these situational training innovations will be greatly enhanced by creative use of new information technologies, including CD-ROM and online, Web-based instructional methods (Sailor et al., *in press*).

Because of the critical PBS feature of systems change, it will no longer be sufficient to train people to master a laundry list of specific intervention techniques (e.g., extinction, prompting, reinforcement); rather, people will also need to know how to deal with the systems in which intervention strategies are embedded and how to integrate technology within broader support infrastructures and networks. Thus, the content of training will also have to include knowledge of administrative issues, funding mech-

anisms, mission and philosophies, and interagency collaboration (Dunlap et al., 2000).

EXTENSION TO NEW POPULATIONS

PBS has made many valuable contributions to improving the quality of life of people with developmental disabilities. It is not surprising, therefore, that there is a mistaken perception that the approach is applicable primarily to this population. In fact, there is growing evidence that PBS is undergoing a rapid extension to other populations as well. Already, the application of PBS has expanded to include people with traumatic brain injury (Singer, Glang, & Williams, 1996; Ylvisaker & Feeney, 1998), typically developing children with school discipline problems (Burke & Burke, 1999; Lewis & Sugai, 1999; Sugai et al., 2000; Warren et al., in press), and children and youth with emotional and behavioral disorders (Dunlap & Childs, 1996; Dunlap, Clarke, & Steiner, 1999; Kern, Childs, Dunlap, Clarke, & Falk, 1994). The extension of PBS represents part of a larger movement in the social sciences and education away from traditional models that have emphasized pathology and toward a new positive model that emphasizes "a science of positive subjective experience, positive individual traits, and positive institutions" (Seligman & Csikszentmihalyi, 2000b, p. 5) with a view to improving quality of life and preventing behavior problems (Seligman & Csikszentmihalyi, 2000a).

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to understand), and that embraces information from various research traditions as credible sources. I believe that this is what Carr and colleagues are trying to say. Inviting others into the conversation can help to make this more inclusive view of science more explicit.

Summary

So, are you a behaviorist or a bonder, or an organizational theorist, an ecological psychologist, a community psychologist, a systems analyst, or a cultural anthropologist? Are you a single-subject, large *N*, or interpretivist researcher? Do you ascribe to positivist, postpositivist, natural inquiry, or postmodernist assumptions? I don't know. What I do know is that I am committed to figuring out how to provide respectful and dignified supports for people with disabilities who engage in challenging behaviors, supports that will ultimately result in meaningful outcomes for these people and their families. In the final analysis, this is what positive behavior support is all about.

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