

On Differentiation in Applied Behavior Analysis

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Distinct types of activity in the field of applied behavior analysis are noted and discussed. Four metaphorical types of activity are considered: prospecting, farming, building, and guiding. Prospecting consists of time-limited exploration of a variety of behaviors, populations, or settings. Farming consists of producing new behaviors in the same setting using independent variables provided by the researchers or normally available in the setting. Building consists of combining procedural elements to create new programs or systems or to rehabilitate aspects of existing programs. Guiding involves pointing out connections between the principles of human behavior and the problems, populations, settings, and procedures with which researchers are (or could be) working. Advantages of each sphere are noted, and benefits of this division of labor to the field as a whole are discussed.

Blessed are the prospectors
for they explore new territory
Blessed are the farmers
for they cultivate the land
Blessed are the builders
for they create new structures and
Blessed are the guides
for they point the way

Growth in the field of applied behavior analysis is apparent: More behavioral psychologists are working on applied problems with more populations in more different settings than ever before. Subscriptions to behavioral journals and the proliferation of special interest groups—such as behavioral medicine and behavioral community psychology—also reflect growth. Indeed, remarkably similar types of activity may be observed in a variety of settings—from institutions to city neighborhoods—and with a range of populations—from children with developmental disabilities to normal adults.

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Although more difficult to detect than growth, differentiation is also beginning to appear within the field. Initially similar forms of applied behavior analysis have diverged into distinct types of activity. As with biological differentiation in which the same cellular mass separates into tissues and organs with different functions, so developments within the field appear to follow different pathways. Better knowledge of distinct pathways may help practitioners of behavior analysis to appreciate the differences, and value them, and each other.

A division of labor or specialization within the field might be an expected consequence of its growth and the increased competition between its members. As Durkheim (1947) noted, specialization in the types of products produced provides stability for societies by reducing competition for basic goods and by creating opportunities for trading between members. Similarly, specialization in applied behavior analysis may help solidify the field by minimizing competition to create new knowledge and methods, and by creating opportunities for the field's members to learn from each other.

The purpose of this discussion is to affirm the plurality within the field. Four metaphorical types of activity are considered: prospecting, farming, building, and guiding. Metaphors are used to describe differentiation in the field to improve familiarity with the phenomena to which they refer and to enhance enjoyment of the discussion. Such metaphor-

ical facts promote comprehension by referring to some properties of functional significance and other properties of related significance (Skinner, 1957, pp. 92-99). For example, the metaphor of "prospecting" may promote the understanding of an applied behavioral response class having properties of relatively brief involvement in a setting and use of the same procedure with different behaviors, populations, or settings. To the extent that metaphorical extensions used here report accurately the critical properties of distinct pathways, they contribute to the reader's ability to act successfully with respect to them.

Although many members of the field engage in more than one of these activities, and mixed forms are common, each type describes a distinct mode of endeavor that may characterize some of the work of individuals or research groups in the field. Following a discussion of each form of activity, some implications of this division of labor within the field are noted.

PROSPECTING

Prospecting consists of the search for minerals, oil, gas, or other materials of economic value. Early prospectors roamed promising territories on foot or with pack animals, noting valuable materials by sight. Modern prospectors use a variety of techniques to detect possible deposits including geological, geophysical, and geochemical methods. Similar prospecting methods are used to detect minerals, oil, and gas. When deposits are depleted, prospectors move on to new territories or in search of new materials. Reinforcement may come for locating large deposits in established territory, new territories with modest deposits, and new forms of valuable materials, or for making effective use of new prospecting techniques.

Prospecting in applied behavior analysis consists of a time-limited exploration of a variety of behaviors, populations, and settings. A common form of prospecting involves using the same technique to extract deposits of the same

material in new territory, such as exploring one land area then another, or shifting from land to ocean exploration. For example, researchers may demonstrate the effects of token economies with similar populations in an institutional setting, a school setting, a group home setting, a family home setting, and so on. Another form of prospecting involves using the same technique to extract deposits of new materials. For example, researchers may demonstrate the effects of public posting on performance with one problem behavior such as compliance with highway speed limits, then another, such as compliance with handicapped parking spaces, then another, and so on. Examples of other techniques often used in prospecting with different behaviors, populations, or settings include informational prompts, modeling and behavior rehearsal, contingent opportunities to win prizes, and performance feedback.

Similarly, as research interests shift or opportunities arise, researchers may attempt to detect effects of similar techniques with new populations such as in the use of contingent social attention with children with developmental disabilities, adults with developmental disabilities, school children, institutionalized elderly, and so on. As with other types of activity, prospecting may be more likely to be reinforced if it involves demonstrations with big effects, unusual subjects, novel settings, or innovative procedures. With prospecting, time spent with the same behavior, population, or setting is brief relative to other types of applied behavior analysis.

The activity of prospecting brings substantial benefits to the field. Perhaps most importantly, it helps to demonstrate the generality of the field's more robust procedures. For example, by applying informational prompts to conserve resources with water faucets, light switches, and room thermostats, knowledge of the likelihood of effects with different behaviors, participants, and conditions is increased. With successive uses, elements of behavioral procedures are often refined.

Prospecting with the same technique may promote understanding of the size

of effects that can be expected under a variety of conditions and multiple setting influences on behavior. It may also help identify the side effects and other limitations of procedures when used in novel environments or with new populations. Finally, as prospectors traverse new territories, their work may suggest new settings and contexts in which other more sustained forms of applied behavior analysis can be practiced.

FARMING

Farming consists of using a plot of land to raise vegetables, fruits, or small animals. Unlike prospecting, farming involves working the same land over time. In standard farming, chemical fertilizers are used to increase the rate and amount of nutrients reaching plants. This type of farming may require chemical pesticides to control pests attracted to these more fragile and less complex food systems. In organic farming, sustainable and renewable resources such as mulch and manure are used to provide nutrients. Organic farmers also use interplanting, earthworms, and a variety of beneficial insects to create a stable and complex environment for plant growth.

Standard Farming

Standard farming in applied behavior analysis consists of producing new behaviors in the same setting using independent variables that are designed and provided by the researcher. For example, preschool or elementary school classrooms are sometimes constructed and maintained as laboratories for university researchers. Such settings are often organized to permit maximum research production as in the use of one-way mirrors from classrooms to observers' booths and standard behavioral checklists and observational codes. Examples of other settings in which standard farming might occur include college classrooms, university practicum sites, daycare centers, halfway houses, and other settings in which researchers may have moderate to considerable control. Such settings are relatively "closed" and researcher-de-

pendent compared to those in which organic farming might occur.

Among the benefits of standard farming is that the applied and basic research efforts of a large number of researchers can be facilitated. In addition, because distractors are minimal, even modest effects of procedures may be detected. Finally, because researchers usually provide the resources required for the intervention, the effects of variables not usually within the means of preschools, daycare centers, or other settings may be examined.

Organic Farming

By contrast, organic farming in applied behavior analysis consists of using antecedent and consequent stimuli that are renewable and sustainable in collaboration with other persons who control the setting in which the research is conducted. For example, research on the effects of incidental teaching in an existing elementary school classroom illustrates the use of procedures that can be sustained without extra resources in a setting in which implementers, such as teachers or school officials, have considerable control over the research. Researchers working in this same setting over time might collaborate with teachers and officials on addressing other problems such as disruptive behavior at recess or food waste at lunch. Organic farming efforts with these problems would use existing resources such as extra recess for appropriate outside behavior or access to recess contingent on meal completion. Other examples of relatively more "open" settings used in organic farming include small businesses, community service centers, neighborhood organizations, self-help groups, and other contexts in which researchers have somewhat less influence over decisions about research and day-to-day operations.

Some benefits of organic farming in the same setting over time include a detailed knowledge of the setting, its participants, and the resources that might be organized to create or sustain new behaviors. Such work may also contribute

to knowledge of the side effects of interventions and what levels of consumer satisfaction with procedures might be expected with certain participants. Finally, by creating effects using existing resources, organic farmers may actually improve the soil, that is, extend capacities of the setting to be productive in the absence of the researcher.

BUILDING

Building consists of the use of methods and materials to create or reconstruct some form for a particular purpose. It involves elements of design—developing a plan for taking action, and engineering—using principles and experiences to construct or remodel the product. Builders design projects (e.g., a single residential home), systems (e.g., an interconnected set of scattered site public housing units), or total environments (e.g., a village for retired adults). Reinforcements for building may come from creating or remodelling forms whose functions have enduring value.

New Construction

Builders of new construction in applied behavior analysis combine procedural elements to create new programs or systems that are designed to replace existing structures.¹ For example, by creating a new behavioral technology for operating group homes for predelinquent children, the designers of Achievement Place attempted to replace the traditional probation and institutional components of the criminal justice system with an alternative arrangement consisting of a number of procedural elements.

New *programs* consist of combinations of procedural elements such as behavioral specifications, modeling, practice, and performance feedback (in the case of skill training programs). Examples include various brands of social skills training programs, job-finding programs, and other small environmental arrange-

ments that combine antecedent and/or consequent procedural elements. New *systems* consist of combinations of program components, such as teaching or motivational components, for promoting acquisition and maintenance of functional behaviors. Examples include the Achievement Place Model, the Behavior Analysis Follow Through Model in elementary education, the Fairweather Lodge Model for psychiatric rehabilitation, the Concerned Care Model of group homes for mentally retarded adults, and various living environments for toddlers, residents of nursing homes, and others.

In contrast to prospectors, farmers, and remodellers, builders of new construction attempt to create a new structure in combining or re-combining procedural elements, the critical features of which will not fit the existing system (Sarason, 1972).

Remodelling

Remodelling in applied behavior analysis consists of combining procedural elements to attempt to rehabilitate aspects of existing programs or systems for promoting acquisition and maintenance of behavior. For example, the design of a "good behavior game" for an existing school classroom or homework study situation involves using combinations of behavioral procedures to improve the contingency arrangements in environments that otherwise remain unchanged. Similarly, a new municipal policy of feedback and contingent noncollection to increase the safety and efficiency with which city trash is collected provides a relatively permanent change in procedural elements within an existing solid waste management system. Consistent with an ecobehavioral perspective, the instructional, behavior management, or environmental design methods used in remodelling are designed so as to be compatible with the setting, program, or environmental context in which they are to fit.

Builders of new behavior technology—those involved in new construction or remodelling—also bring important ben-

¹ Todd Risley contributed substantially to this and other ideas in the section on "building."

efits to the field. Their efforts result in new methods and materials that can be used to solve problems of individuals and the environments in which they live. The availability of alternative arrangements for addressing problems permits market forces to operate in selecting methods that are more effective, cheaper, or otherwise more preferable to the consumer. For example, availability of an effective group home model for mentally retarded adults puts pressure on existing institutions to improve the type and quality of their services. Finally, involvement of users in creating and adapting behavioral technologies—a hallmark of good designing—extends the capacities of those affected by environments to improve their functioning (Fawcett, Mathews, & Fletcher, 1980).

GUIDING

Guiding consists of pointing the way along a path from the familiar to the less familiar. With their intimate knowledge of the territory, guides can help identify the nuances, difficulties, or dangers involved with a variety of courses. For example, indigenous guides may help prospectors detect deposits in new territory or find their way back to the mining camp. In general, guides help others see connections between where they are and where they might be.

Similarly, guiding in applied behavior analysis consists of pointing out connections between the principles of human behavior and the problems, populations, settings, and procedures with which researchers are (or could be) working. General statements resulting from guiding, such as description of an implicit technology for generalization, stimulate new research and improve practice within the field.² Unlike other more empirical forms of activity in the field, guiding is more conceptual or theoretical and is often a solo research activity. A classic example of guiding in applied behavior analysis is

the Baer, Wolf, and Risley (1968) article that set the first standards for research in the field.

Other prominent forms of guiding include writing discussion articles that point the way to other relevant disciplines (e.g., economics and policy analysis), literatures (e.g., diffusion of innovations), measures (e.g., social validation), methodologies (e.g., statistical analyses of time series data), or issues (e.g., ethics). Other guiding efforts provide a behavior analysis of aspects of problems (e.g., institutions of power), populations (e.g., insularity of families), settings (e.g., behavioral ecology), or interventions (e.g., characteristics of contextually appropriate behavioral technologies).

Guiding also contributes substantially to the field. For those attempting to build new programs or institutions, guides may help point out connections between nitty-gritty research and development and the principles of behavior that can and should serve as a conceptual framework for these efforts. Also, descriptions of issues such as ethics that are the subject of scholarly work in other disciplines such as philosophy help broaden the perspectives of those within the field. Finally, analyses of the work in other disciplines such as policy analysis, economics, or conflict management help point the way to new and promising applications of behavioral principles.

AN EXAMPLE OF DIFFERENTIATED ACTIVITY

This discussion has characterized the field of applied behavior analysis as having rather distinct forms of activity: prospecting, farming, building, and guiding. Of course, pure forms of an activity are somewhat unusual because an endeavor may incorporate different forms, as with work in designing a new package of variables (building) that incorporates elements of established procedures refined in several settings (prospecting). The situation is further complicated by the fact that most researchers engage in all of these activities at one time or another, making it inappropriate to categorize most re-

² The term "guiding" was recommended by Dick Winnett; Bill Hopkins also contributed insights to this section.

searchers as a "prospector," a "farmer," or an exclusive practitioner of any single form of activity.

To enhance discriminations among these metaphorical classes of professional behavior, consider the following research activities of a fictitious behavior analyst.³ In a series of studies designed to examine the *generality of the independent variable* contingent praise, she examined its effects with children of preschool age in several settings including the laboratory classroom, the playground, and at home (prospecting). In the university's laboratory preschool, she conducted a line of research examining behaviors of children, teachers, and parent volunteers in this setting using *existing techniques controlled by the researcher* such as token reinforcement (standard farming). In another line of research, she worked at the request of a self-help group for parents of children with developmental disabilities, applying peer feedback and other *existing techniques within the resources of the group* on meeting attendance and other problems selected by the group (organic farming).

Some years ago this fictitious behavior analyst and her collaborators designed a *new brand* of home tutoring program for junior high youth that involved a *novel combination of procedural elements* including goal setting, peer tutoring, and token reinforcement for progress in specified learning units (builder of new construction). In more recent work, she developed a *new set of procedural elements* consisting of performance standards, self-monitoring, and salary bonuses; its effects were evaluated on various aspects of teacher and child performance in the *context of an existing system*, an accountability system operating in the preschool classroom (remodelling). Finally, her recent writing describing *behavioral principles* involved in consumer self-advocacy suggests *new methods* for increas-

ing parent control of preschool classroom goals and activities (guiding).

SOME IMPLICATIONS OF DIFFERENTIATION

Several implications flow from a conceptualization of these distinct forms of activity as a division of labor in the field.⁴ This perspective highlights the interdependence of workers in the field and opportunities for trade among its members. For example, as farmers and builders become immersed in unique aspects of the settings, populations, and structures with which they work, their activities sometimes become removed from the principles of human behavior that should guide such efforts (Michael, 1980). Indeed, a conceptual framework for some efforts at farming or building often lags behind successes in solving the applied problems presented by the specific setting, population, or system. The work of guides in articulating the principles of human behavior or the standards for behavioral research can help farmers and builders transcend the idiosyncracies of their work by relating it to the principles of human behavior.

Similarly, the relatively brief and intrusive contacts with settings and populations characteristic of prospecting may limit opportunities for understanding the phenomena or contributing to relatively permanent improvements in identified problems. The work of farmers may offset these limitations by providing models for focused and sustained research activity on problems of the same population or setting. Their knowledge of specific populations (e.g., delinquents and poverty families) or settings (e.g., group homes and community service centers) may contribute insights into how new procedures, observational systems, or research designs may be applied in specific contexts. Thus, the contributions of distinct spheres may be seen as complementary.

³ To avoid the implication that a given researcher is a practitioner of a single form of applied behavior analysis, examples are provided for a fictitious behavior analyst, rather than citations from the research literature.

⁴ Don Bushell first noted the relevance of division of labor to this analysis and otherwise contributed to this discussion of reciprocal benefits to the field's members.

In other cases, the work of different forms of applied behavior analysis has reciprocal benefits. Newly created systems such as group homes provide settings in which prospectors may examine the generality of behavioral procedures with new populations and settings. In addition, the work of builders may suggest to prospectors how individual behavior change procedures can be combined in a more comprehensive approach to solving identified problems. Conversely, as builders attempt to create effective programs and systems, their choices of independent variables can be informed by the efforts of prospectors whose work helps to detect the more successful applications of behavioral principles.

The recognition of reciprocal benefits between areas of activity suggests the importance of nurturance of all spheres by the field (Baer, 1981). Opportunities for improving instruction and reinforcement for distinct activities include adjusting the reviewing policies of existing behavioral journals. For example, associate editors and reviewers might be chosen on the basis of their familiarity with a particular type of activity, such as farming, in addition to experience with the population or setting and knowledge of the principles of human behavior. Choosing colleagues familiar with a particular sphere of activity may help avoid imposing standards that are unreasonable, such as demanding active dissemination of procedures from prospectors. It may also permit a more knowledgeable assessment of the size of contribution to be expected from a particular effort such as an evaluation of a component of a program developed by a builder.

In addition, work of a certain type might be featured in special issues of behavioral journals that highlight current efforts in a particular sphere.⁵ For example, newly designed programs and systems to educate preschoolers, to prepare young adults for employment, to reduce

recidivism of predelinquents, and to provide community living skills to mentally retarded adults might be reported in the same special issue. Thus, the commonality of efforts by builders and others could be illustrated through special issues of existing journals.

Other important mechanisms for improving and maintaining efforts of each type include participation in conferences and special interest groups. Conferences provide opportunities for trading folklore about prospecting with a particular technique, farming in particular soil, building a particular structure, or guiding in a certain direction. In addition, symposia and meetings of special interest groups permit displays of common types of efforts and/or critiques by colleagues proficient in other modes of activity. For example, sponsors of a symposium on building standardized parent training programs might solicit discussant comments from a prospector knowledgeable in generalized applications of behavioral principles, a farmer familiar with family situations, or a guide conversant in ethical issues of intervening in the privacy of homes. Thus, behavioral journals, conferences, and special interest groups are prominent means by which the activities of prospecting, farming, building, and guiding can be maintained and improved.

A more fundamental question remains: whether the field—with its collection of prospectors, farmers, builders, and guides—is of benefit to society. As early applied behavior analysts advance in social systems based on rank, experience, and contributions, greater opportunities and resources for improving society may accrue to members of the field (Risley, 1977). Such opportunities may contribute eventually to widespread adoption of behaviorally based ideas (e.g., behavior analyses of nuclear disarmament), practices (e.g., contingent attention), and systems (e.g., group homes). Feedback from consumers on the social importance of our behavior analyses, procedures, and systems may help shape approximations of beneficial activity in each sphere (Wolf, 1978).

⁵ Judi LeBlanc pointed out the utility of special issues of journals in communicating about distinct forms of activity in the field.

This paper has noted several distinct forms of applied behavior analysis and suggested some reciprocal benefits of the existence of one to another. A recognition of this division of labor and a nurturance of each type may help avoid competition between members and contribute to evolution in the field.

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