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PROCESS AND CONTENT IN BEHAVIORAL AND CULTURAL PHENOMENA

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ABSTRACT: The phenomena to be explained in terms of scientific principles may be termed the "content" of a science. *Behavioral* content is organized at the level of individual organisms. Human behavioral repertoires are unique and complex organizations of activity/environment relations. The content of human behavior is accounted for in terms of evolutionary processes occurring at the behavioral level of analysis, during the lifetime of individual organisms. *Cultural* content originates when behavioral repertoires of two or more individuals form an enduring unit that has the possibility of lasting beyond the lifetime of those individuals. Evolutionary processes occurring at the cultural level of analysis account for cultural practices that extend across generations. The units that come into existence as a result of behavioral and cultural evolutionary processes are the *content* of behavioral and cultural sciences. Science-based solutions to human problems involve making use of knowledge of behavioral and cultural processes to bring about change in behavioral and cultural content.

One of the primary values of science is the support it provides the public in solving various kinds of problems. The physical sciences have provided the basis for solutions to an astounding variety of practical problems during the past few hundred years; and the biological sciences have provided the basis for modern medicine with associated increases in survival, longevity, and quality of life. Although it is axiomatic that some of the products of science-based technologies pose serious problems for humankind, the human "misuse" of technology is a problem of human behavior and of the cultural practices in which it is embedded--not a problem with technology itself. We know of few people who would prefer to live without rather than with hot water heaters, air conditioning, indoor plumbing, antibiotics, analgesics, innerspring mattresses or computers. We agree with Skinner (1953) that the human misuse of technology can be viewed as the result of the vast discrepancy between our scientific understanding of physical and biological pheno-

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mena and our scientific understanding of behavioral and cultural phenomena. In short, ignorant of how our own behavior comes to be and changes, and how our cultural practices guarantee replication of that behavior in others, we are in a poor position to ensure that our physical and biological technologies don't pose serious threats to life on earth (among other potential side effects).

Because behavioral and cultural subject matters intersect, opportunities are afforded for conceptual integration that may bear upon integrated solutions in the world of human affairs. The relation of behavioral to cultural phenomena has been of growing interest to scientists on both sides (e.g., Biglan, 1991; Glenn, 1988; Harris, 1964, 1984; Lamal, 1991; Lloyd, 1985; Malagodi, 1986; Malagodi & Jackson, 1989; Malott, 1988; Rakos, 1988, 1989; Vargas, 1985).

We seek to continue the process of exploring how these subject matters relate to one another. First we distinguish between *process* and *content* as they pertain to phenomena of scientific interest. Next, we consider levels of organization in behavioral and cultural *content*. Then we turn to *process* at the two levels; and finally, we consider intervention at the two levels.

DISTINGUISHING BETWEEN PROCESS AND CONTENT

The phenomena to be explained in terms of scientific principles may be termed the "content" of a science. Those phenomena may have a "noun-like" character or a "verb-like" character (Hineline & Wanchisen, 1989). For example, organisms, planets, and cells appear as "things" to the human observer and they usually are the first kind of phenomena to which investigators turn. Phenomena that have a verb-like character, like the firing of nerve cells and the activity of organisms, seem harder to conceptualize in terms of units of scientific analysis. Whether the phenomena of interest are verb-like or noun-like, however, their existence in space-time and their organization comprise the content to be explained by principles and/or laws pertaining to that content.

The content of human behavior may be roughly characterized as what people do and say. A science of behavior must account for the fact that different people behave differently and that one person behaves differently at different times and places. Jane regularly tunes in the rock station on the radio and her brother Jim turns the dial to classical; however, Jim tunes in the rock station every time Jane's friend Susan is visiting. These are examples of behavioral *content* and they are among the phenomena to be identified and explained.

Explanation of behavioral phenomena may take a variety of forms, as does explanation in other scientific arenas. One goal of scientific inquiry is to formulate principles or laws that account for the origins, the form, the frequency, and/or the internal structure of the phenomena comprising the subject matter. Statements of lawful relations may be considered descriptions of *processes* occurring at the level of integration of the subject matter under study. For example, behavioral principles

describe the processes that account for the fact that both Jane and Jim turn on the radio, that they usually tune in different stations, and that Jim sometimes tunes in one station and sometimes another. In short, behavioral principles *describe* processes and *explain* content.

The processes that account for differences in Jane and Jim's radio-tuning are the same processes that account for completely different behavioral content in other individuals. Thus, behavioral principles are content-free, even though specific behavioral content was examined in order to formulate the principles. The content that has been used most often in the experimental analysis of behavior has been in the form of bar pressing or key pecking. But this is as irrelevant as is the fact that evolutionary biologists use fruit flies and bacteria to study processes of biological evolution which they claim account for the existence of homo sapiens as surely as they account for the existence of bacteria and fruit flies.

Some behavior analysts are interested in developing general principles that describe the ways in which behavioral units come into existence, how they evolve, maintain or disappear, their frequency relative to other units, the various ways in which they can be related to antecedent stimulation, etc. In short, they are interested in the *processes* that account for behavioral content. If the physical and biological sciences are predictive, a small number of descriptive principles will be able to account for a vast range of behavioral content. Behavioral principles have been formulated as a result of experimental analysis of behavioral units constructed in highly controlled environments. Their generality is then assessed by way of research in more natural settings, where uncontrolled variables abound (cf. Johnston and Pennypacker, 1980, chap. 19). Whether in laboratories or natural settings, researchers interested in behavioral *processes* construct behavior the content of which is selected on the basis of convenience, not on the basis of its social importance.

Other researchers use the experimental method to assess techniques designed to alter specific behavioral content. The social need to bring about change in particular behavioral content is what drives the experimental work of these researchers. When applied behavior analysts study the conditions that account for change in specified behavioral content, their choice of ways to manipulate environmental events reflects their understanding of behavioral *processes*. Selecting and evaluating intervention techniques requires knowledge of behavioral processes and knowledge of specific dimensions of the activity/environment relations under examination. Applied behavior analysts tend to work with a specific population, or a specific problem, or in a specific setting because their own discriminative repertoires are acquired with respect to *content* that is characteristic of that population, problem, or setting. The principles that describe behavioral processes provide the framework within which specific behavioral relations are understood. That conceptual framework enhances transfer of skills to new populations, problems, and settings.

In the domain of cultural analysis, the task of formulating general principles that describe cultural processes may be even more difficult than in the behavioral domain. First, the units of analysis are both verb-like and even more abstract than are behavioral-level units of analysis. Second, cultural units exist over extended time, often beyond the lifetime of individual scientists. Third, it is difficult to create an "experimental unit" (comparable, say, to a pigeon's operant bar press) because the cultural unit will involve the behavior of multiple individuals. Thus, in order to formulate principles that describe evolutionary processes at the cultural level, cultural analysts must rely much more heavily on extensive knowledge of extant cultural content, which is the business of ethnography.

By considering ethnographic information in the context of archeological data, scientists can make inferences regarding past cultural content. Principles of cultural evolution might then be formulated to explain the cultural content. Thus, cultural evolutionists (like evolutionary biologists) begin by working backwards, formulating general principles on the basis of relations currently existing between cultural practices and environmental conditions under which the practices occur. The cataloguing of cultural content, then, is something of a prerequisite for formulating lawful relations that describe cultural processes.

ORGANIZATION OF CONTENT IN BEHAVIORAL AND CULTURAL ANALYSIS

Behavioral content is organized at the level of individual organisms. That is the reason that the experimental analysis of behavior uses single subject methodology. It is only with respect to a single organism that a behavioral history has meaning. One can ascertain if the principles describing behavioral processes are generalizable only if the processes can be replicated to produce both similar and different behavioral content in other organisms. This is similar to Harris's (1979) point that cultural principles must account for both similarities and differences in the practices of different cultures. For example, the same principles must account both for the fact that several Mideastern cultures eschew pork and the fact that pork is a primary food source in American culture, especially in the South (Harris, 1985).

What does it mean, though, to say that behavioral content is *organized* at the level of individual organisms? A human repertoire is not simply a compendium of unrelated behaviors any more than an organism is a pile of unrelated cells. The professional work of some behaviorists involves working with organisms who are the locus of extremely complex relations between activity and environment--that is the very meaning of "person" (Lee, 1988). These professionals (often clinicians) must understand the interplay between behavioral processes and behavioral content (Glenn, 1989). Such a requirement probably accounts for the few attempts behavior analysts have made to account for the content and organization of complex

behavioral repertoires (e.g., Schwartz & Goldiamond, 1975; Lubinski & Thompson, 1986).

The content of human repertoires comes into existence during the lifetime of each individual, and early behavioral relations appear to be quite simple. For example, an infant may learn to turn in the direction of sounds, then to turn only when certain sounds occur, then to turn and coo when those sounds occur, and so forth. One might consider the first behavioral units to appear to be irreducible units. When these units are compounded (into "homogeneous" and "heterogenous" combinations according to Lubinski & Thompson, 1986), higher-order units are formed. These units are then brought into more complex kinds of relations with environmental events, which allow for unlimited permutations and combinations (for example, the conditional control of generalized imitation). Higher-order units are formed in which different combinations of the basic units function interchangeably under third-order or fourth-order conditional control.

The point is that a behavioral repertoire is a unique and complex organization of activity/environment relations. If every snowflake is unique, every person (even an identical twin) is profoundly unique. Considering the billions of ways that an individual's behavioral repertoire could be organized with respect to environmental events, it may seem odd that we can detect any similarities at all among individual repertoires. (The satisfaction we take in finding a "kindred spirit" suggests the rarity of such occurrence). There are enough similarities among repertoires, however, to allow most of us to get by; and the reason is that the repertoires of individual humans are formed in the context of cultural practices.

When behavioral relations that define some of the content of one organism's repertoire are replicated in the repertoires of other people in a sociocultural system, the replicated behavior is called a "cultural practice". Cultural practices may range in complexity from a simple practice like macaque monkeys washing their potatoes in a stream to a complex practice like the child-rearing practices of a segment of a population (for example, American middle class). The increasing complexity of behavioral repertoires, within and across human generations, and the rapid changes in environments into which humans are born are the results of the increasing complexity of cultural entities. So we turn now to organization at the cultural level of analysis.

Cultural entities have their own level of organization, although there appears to be little agreement among cultural analysts regarding the nature of the entities so organized. If cultural evolution is to be explained, cultural entities must be specified in such a way as to clarify the processes that account for their origin. Skinner (1981/86) stated that "a culture evolves when practices [that began with one behaving individual] contribute to the success of the practicing group in solving its problems" (1986, p. 14). Harris (1984/86) criticized the way Skinner "characterizes the contingencies responsible for cultural selection" and Skinner's failure to define "group" (1986, p. 46). Although we will build on both their

contributions, integration will require going beyond both.

Cultural phenomena are built on behavioral phenomena, which is not to say they can be reduced to behavioral phenomena (any more than behavioral phenomena can be reduced to physicochemical events). One cultural-level entity identified by Harris (1964) is a *nomoclone*. From a behavioral perspective, a nomoclone is a cultural unit comprised of interlocking behavioral contingencies. The interlocking contingencies involve the behavior of two or more individuals, as it occurs in a particular context and is repeated across time. A nomoclone is an instance of a cultural practice, defined in terms of the behavior of the specific individuals who participate. It requires repetition of behavioral content which entails repetition of behavioral contingencies. An example of a rather complex nomoclone is Sue and Jim Smith's annual 4th of July party. It can be specified as a nomoclone because 1) the same people are involved every year (Sue, Jim and both their parents), 2) the behavior of each of the individuals is embedded in a series of interactions that produce an outcome that results from their aggregated behavior, 3) the interactions are roughly the same from one year to the next and they produce roughly the same outcome.

If the interactions and the outcome remain roughly the same even after some of the people are replaced by others, the entity is called a *permaclone*. Nomoclone or permaclone, the cultural entity is defined by the *content* of the interlocking behavioral contingencies. No cultural entity would exist without organisms, but it is the *behavior* of organisms that provide the building blocks for cultural content.

Each person in a contemporary sociocultural system acquires his/her behavioral repertoire in the context of many different permaclones. To the extent that the permaclones provide compatible behavioral contingencies, the person's repertoire will be "integrated". In any case, the behavioral content characteristic of a person is a product of the specific interlocking contingencies in which the behavior is embedded. That is, the behavioral contingencies that account for the content of individual behavior are themselves part of the content of a cultural entity. Like behavioral repertoires, permaclones are identifiable by their content. A permaclone's content is specified by the particular content of the interlocking behavioral contingencies of which it is comprised.

Permaclones, like behavioral units, may combine to form more complex cultural units; and those units may be integrated in even more complex units. These cultural-level units clearly are not organized at the level of individual organisms. Their boundaries circumscribe the interlocking behavior of a number of organisms. And it is the interlocking contingencies, not the organisms, that constitute the cultural entities; those contingencies can (and do, if the permaclone continues in existence) form a structure that remains intact even when participating organisms change from time to time.

PROCESS AND CONTENT

BEHAVIORAL AND CULTURAL PROCESSES

Principles that describe processes occurring at the behavioral and cultural levels are explanatory devices. They explain the origins of extant behavioral and cultural content and specify the means by which new behavior is acquired during the lifetime of individuals and how new cultural practices develop.

The processes described by behavioral principles are evolutionary processes, but not the processes of *biological* evolution. Behavioral processes share some conceptual similarities with the processes described by the principles of evolutionary biology, but they differ regarding the units whose existence, form, and frequency they explain. Further, behavioral processes are the *products* of biological evolution. Therefore, behavioral evolution and biological evolution are related to one another substantively as well as being members of the logical class "evolutionary processes".

Behavioral Evolution

Selection as a causal mode plays a fundamental role in both behavioral and cultural processes (Skinner, 1981/86). The behavioral content of individual repertoires has its origin in the selection processes of reinforcement, extinction, and punishment. Other behavioral processes, such as unlearned generalization, stimulus control, and conditional control work in conjunction with behavioral selection in producing behavioral content (cf. Staddon and Simmelhag, 1971). As in the case of biological evolution, the products of these processes become more complex and more numerous in kind.

In terms of the content they can produce, biological evolutionary processes are constrained by the characteristics of the earth in which those processes are grounded. Similarly, behavioral processes are constrained by the characteristics of organisms in which they are grounded. In addition, behavioral processes are constrained by the dimensions of the environment with which each specific organism interacts. This means that even though the same behavioral processes account for the content of each human repertoire, the content will always be unique and uniquely organized. An individual repertoire may be likened to a behavioral universe--a universe of unique behavioral relations, the historical continuity of which is grounded in an individual organism--much as the known biological universe is historically grounded in the planet earth (Glenn, 1991).

Experimental analysis of behavior has resulted in the formulation of principles describing processes of behavioral evolution. Although experimental analysis at the cultural level may be difficult, one might ask whether evolutionary processes occur at the cultural level. Do natural selection and behavioral selection together account for the evolution of cultural practices, or does some additional kind of selection by consequences occur at the cultural level?

Cultural Evolution

In order to claim that some kind of selection by consequences occurs at the cultural level, one must eventually specify what is selected and what evolves. It has been over 130 years since Darwin and Wallace publicly suggested natural selection as the mechanism accounting for the existence and evolution of species. Although biologists do appear to agree that species are what evolves, they are not in general agreement as to what a species is (Mayr, 1988). And although they are agreed that characteristics of the physical environment (including other species) are the "nature" that selects, they don't agree on the unit of selection. Some say organisms are selected, some say genes or gene combinations, some say populations of organisms (Brandon & Burian, 1984). If we consider evolutionary biology an appropriate model of scientific effort, it will not be necessary to have formulated all the answers to the most basic questions before pursuing any others. Accordingly, we put forth below suggestions for consideration as to what evolves and how the selection process operates at the cultural level.

A Unit of Cultural Evolution

Cultural practices are what change over time, but the unit of analysis must be clearly specified. One feature required of a cultural unit of analysis is that it be capable of extending in time beyond a single generation. Another feature required (at least if explanation is to remain naturalistic) is that the cultural unit be based on observable objects and/or events. In accordance with the latter requirement, both Harris (1964) and Skinner (1953, 1981/86), take behavior to be the basis of cultural entities. We have previously suggested that each behaving individual's repertoire is a unique behavioral universe; but elements of a behavioral universe may enter into functional relations with elements of another behavioral universe to form higher-order entities--in the present case, cultural units.

The unit of evolution (what evolves) in biological evolution is the species; the unit of evolution in behavioral evolution is the operant. The unit of evolution in cultural evolution must be given a name if we are to be able to talk about it. We shall go along with the term *permaclone* because that term, as defined by previous writers, provides a starting point for us here. The basic elements of a permaclone were elucidated by Harris (1964). Those elements include 1) repeated enactments of a scene, 2) by a group of individuals, 3) the personnel of which group changes gradually over time. Glenn (1988, 1991) examined what "repeated enactments of a scene" might mean from the perspective of a behavior analyst. Such enactments were conceptualized as interlocking behavioral contingencies in which the operant behavior of each participating individual was maintained by contingencies provided by the behavior of others and the products of that behavior.

PROCESS AND CONTENT

Naming the cultural unit that evolves a *permaclone* creates certain difficulties. The term has a profoundly noun-like character and thus places undue focus on organisms. But cultural entities are firmly grounded in behavior and better characterized as "verb-like"--characterized as "*pattern in activity*" rather than "*structure in stuff*" as Hineline and Wanchisen (1989, p. 228) put the case with respect to behavior itself. The content of a permaclone is not characterized by the participating organisms but by the behavior of those organisms. Because organisms are so solid and concrete, though, and behavior is so fleeting and evanescent, it is difficult to focus on the behavior as the figure and the organisms as the ground in a permaclone (cf. Hineline, 1986). Perhaps such a focus is even more difficult to maintain with respect to cultural content than it is with respect to behavioral content.

Strictly speaking, however, the character of a permaclone is not captured even by focusing on the behavioral content of its participants. It is the *interlocking behavioral contingencies* that comprise the content of a permaclone. These contingencies are what last across generations and the interlocking contingencies are what change when the permaclone evolves.

If the content of permaclones is interlocking behavioral contingencies, then cultural evolution must be accounted for in terms of the origin and maintenance of such interlocking contingencies. Skinner (1981/86) suggested cultural selection is "selection of a third kind". But how does it occur?

Cultural Selection

If selection by consequences occurs at the cultural level, and the unit of evolution is the permaclone, how do consequences account for the existence of permaclones? Paraphrasing Glenn (1988), permaclones produce consequences as a function of the aggregate behavior of the interlocking behavioral contingencies. The cultural level consequences are distinguished from behavioral level consequences in this way: A behavioral consequence is contingent on the activity of a single organism and it selects the behavior of that individual only. A cultural outcome is a change in the environment that results from the *aggregate* behavior in the interlocking behavioral contingencies that constitute a particular permaclone. The changes in the environment produced by the aggregate behavior of permaclones may then function (either shortly, much later, or in a gradually increasing fashion) to strengthen the interlocking contingencies (constituting the permaclone) or weaken them.[1]

Cultural consequences will be designated as "outcomes" to distinguish them from behavioral consequences. Such outcomes may affect the future of the permaclone in one of several ways. First, the outcome of the interlocking contingencies (i.e., changes produced in the environment) may render the current practice outdated or insufficient to maintain the unity of the permaclone - thus the

permaclone (interlocking behavioral contingencies) may disappear. The population of humans whose behavior comprised the permaclone may scatter and their behavior enter into new permaclones.

The failure of various savings and loan institutions is an example of the disappearance of numerous permaclones that resulted from the outcomes of the practices of those permaclones. The individuals who worked at those institutions may be working at other institutions now, but the practices of the extant institutions differ (one hopes) somewhat from the practices of the failed institutions, thus the individual's behavior now participates in a permaclone having somewhat different content. The content of the behavior of those individuals has probably changed also, due to changes in behavioral contingencies for those individuals.

Second, the outcome of a practice may be insufficient to meet environmental requirements and, as a result, the organisms constituting the population whose practices comprise the permaclone fail to survive. In this case, the behavior of its members would not be represented in other permaclones and this "line of cultural descent" would cease entirely. Because sociocultural systems with which we are familiar are so large and complex, it is difficult to imagine circumstances in which a cultural practice has an outcome that results in the death of all the individuals contributing to the outcome. Even when particular permaclones go extinct (interlocking contingencies exist no more), the participants are usually concomitantly participants in other permaclones. For example, although the interlocking behavioral contingencies that constituted Sunshine Savings no longer exist, the people whose behavior comprised parts of those contingencies still exist. The physical survival of people is rarely dependent on the survival of any particular permaclone, at least in modern sociocultural systems. There may have been historical instances, however, where the extinction of particular permaclones resulted in the disappearance of the individuals participating in the practice.

A third kind of outcome of interlocking behavioral contingencies of a particular permaclone may be changes in the environment that enable more effective behavior of individuals and more effective cultural practices. Presumably the entire evolution of sociocultural systems that appears to have occurred has resulted from the increasing complexity of behavioral environments that have been the outcomes of earlier practices.

TROUBLES AND ISSUES

As suggested by Malagodi and Jackson (1989), the problems confronting the human race come in two forms: troubles and issues. Troubles are suffered by individuals and are peculiar to their individual circumstances. When enough individuals are confronted with the same sorts of troubles, one might consider this a social issue. The similarities in the problems of those individuals must relate in some way to the cultural practices in which those people participate. Such

problems may not be resolvable unless the cultural practices themselves are addressed.

As change agents, people may intervene in ways that impact people one at a time (or in small groups). This is likely the method of choice if extensive changes are required in the behavioral repertoires of individuals and if individual behavior change will be maintained in the context of extant cultural practices. Such behavior change is the purview of clinicians and counsellors and often requires considerable time and individualized intervention technology. If the desired outcome requires multiple changes in an individual's repertoire, the change agent must have knowledge of 1) behavioral content characteristic of that repertoire and 2) of the particular contingencies maintaining the behavior causing the individual problems.

Sometimes it is possible to intervene in ways that result in a particular kind of behavior change in a number of people all at once. Such mass technology is especially important when the behavior at issue poses serious problems for society as well as for the behaving individuals. Geller's work on safety belt use and driving under the influence of alcohol are examples of research on behavior technology designed to impact a highly delimited class of behavior in large numbers of individuals. Geller (in press) has been able to experimentally isolate environmental parameters contributing to the occurrence of DUI and of safety belt use and to devise environmental interventions that change the rate of occurrence in large numbers of people concurrently.

Biglan (1991) appears to have taken an additional step in creatively combining the analysis of behavior and of cultural practices to devise interventions that result in reduced rate of smoking of individually unspecified smokers. The actual target of Biglan's interventions is the interlocking contingencies in which smoking behavior is embedded. But the entities targeted for survival and nonsurvival are still *behavioral* units, not cultural units.

The next step might be to examine various kinds of interlocking contingencies to ascertain their relative effectiveness in producing outcomes. Experimental analysis can occur at the cultural level, and serious attempts are being made to conduct such analysis (Communidad Los Horcones, 1989). It may be difficult to imagine experimenting with a sociocultural system as large as a modern nation-state; but cultural level units of analysis are considerably smaller than that anyway. Behavior analysis began by experimentally analyzing basic behavioral units and enormous progress has followed. Technological advances at the cultural level may similarly require that cultural analysis proceed "from the ground up."

In order to design solutions to problems emanating from human behavior, we might first ascertain the conditions under which action designed to affect directly the behavior of individuals can make a difference. Geller's work suggests that the repertoires of large numbers of people can be changed by contingencies operating independently on each individual.

In other cases, the behavior of specified individuals cannot be readily changed

because the change agent does not have access to their specific behavioral environments. Further, the changes required may involve so many individuals that intervening in the behavioral environment of each is entirely impractical, even if feasible. In order to deal with these problems, what might be called "contingency management" at the cultural level might be possible. Indeed, such "management" of cultural contingencies does appear to occur but the management occurs with little understanding of the processes involved, so the changes are rarely those that are desired.

For example, if financial support for (and thus continued existence of) a school were contingent primarily on the performance of its soccer team, one would not be surprised if the behavioral contingencies defining that permaclone included allowing students to miss classes to practice soccer. One might also predict that academic performance and classroom conditions would be poor and effective instructional technology lacking.

By arranging a contingency between academic progress and financial support for the school, selection would occur for altogether different behavioral contingencies. Such a course of action is not as simple as it may seem, however, as reformers have discovered. Such changes sometimes produce unexpected outcomes. Undesirable behavioral contingencies would be especially likely if "academic progress" could be faked, or redefined spuriously, or so difficult to achieve that failure (extinction/nonsurvival) were inevitable.

Intervening at the cultural level might best be studied on a small scale. An empirical, and possibly even experimental, approach may be possible if one takes the *permaclone* as the evolutionary unit and studies it carefully. One might change the outcome criterion gradually. One might monitor closely the changes in interlocking behavioral contingencies that actually occur, much as one monitors the changes in a behavioral unit targeted for intervention. One might try replicating a successful intervention several times before enacting legislation that mandates all the schools in a state or a school district perform to meet a new criterion. One might encourage innovation with respect to the new interlocking contingencies that eventually meet the survival criterion. In this way, cultural analysts may discover the common characteristics of those permaclones that meet the demands of the selecting environment.

The experimental analysis of behavior may have much to offer those who would intervene in cultural practices that appear to be going awry. Although intervention is regularly practiced by legislatures, courts, task forces, boards of directors, and a variety of other self- or socially-appointed individuals and groups, the effects of those interventions rarely seem to be examined systematically. We hope the present analysis moves us even a little closer to the experimental analysis of cultural practices. By understanding the evolutionary processes accounting for behavioral and cultural content, we may find that "acting to save the world" (Skinner, 1987) is possible after all.

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NOTES:

[1] We are discussing only the simplest case. Permaclones may themselves combine in higher-order combinations of interlocking contingencies to form a permaclonic system which has its own cultural-level outcome.