

COMMENTARIES ON SELECTION AND COMPLEXITY

UNITS AND MEASURES: A RESPONSE TO GLENN AND MALOTT

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Organizations are, indeed, enormously complex entities, and Glenn and Malott (2004) have made an important contribution to the analysis of this complexity. Each of these authors has also made significant individual contributions on related issues in a number of other works. As we see it, the survival of behavior analysis as an interpretive enterprise critically depends on its adaptability to changing scholarly conditions. Of particular note among these conditions at the present time is the burgeoning of interdisciplinary study. The continuation of an intellectual enterprise in this climate may very well depend on the ease with which it is capable of becoming engaged in such study, and the speed with which it does so. Glenn and Malott's (2004) work shows an appreciation of this circumstance, and offers a path to our future in this regard. The comments to follow are offered in support of their work.

Complexity

The analysis of a complex subject matter follows upon an initial construction of some set of units into which observations having some commonality may be grouped, such as to permit other scientific operations to be made with respect to this subject matter. For example, the cell and the gene comprise units of this sort in different branches of biology, and it is upon these units that other abstracting and generalizing operations are performed in these sciences. In the science of behavior, this unit is the operant, defined as a class of behaviors grouped by common controlling variables. Accordingly, operations of prediction and control in the science of behavior pertain not to individual instances of behavior, but rather to the operants of which such instances are members. Hence, to the extent that prediction and control of organizational change constitute the larger purposes of Glenn and Malott (2004) in depicting organizational complexity, units of this sort are a necessary feature of their formulation.

Toward this end, the authors have articulated a number of valuable constructs. For example, organizations are characterized by three sorts of complexity, namely environmental, component, and hierarchical. The first of these is not so much a characteristic of organizations *per se* as it is a description of the external circumstances under which they operate. Environmental complexity is analogous to the controlling variables determining membership of individual responses in operant classes. Different operants are distinguished by different controlling variables, however. This does not appear to be the case for environmental complexity, as all organizations operate in a

context of external circumstances of the sorts enumerated by the authors. Hence, for this characteristic of organizations to serve analytical purposes, some such variables must be conceptualized as more pertinent than others for the characterization and differentiation of specific organizations. An articulation of differences among organization types along these lines would thereby seem to constitute a useful refinement of this taxonomical element.

The categories of component and hierarchical complexity more specifically characterize organizations *per se*. These categories are roughly analogous to the formal or topographical characteristics of behavior. By way of illustration, a response may be comprised of multiple components, among which might be included muscular, perceptual, and glandular actions. Further, a response might be conceptualized as a configuration of pre-current, interim, and final elements occurring in sequence. Individual responses are identified by these means as are, presumably, individual organizations.

In behavior science, however, the topographical features of responses do not constitute grounds for their collection into operant classes. Individual responses are collected into classes on the basis of their controlling variables. This suggests that the categories of component and hierarchical complexity are descriptors of individual organizations, not criteria for the grouping of organizations into functional classes. An articulation of differences among controlling variables is needed for the latter.

In summary, Glenn and Malott (2004) have identified two significant dimensions along which organizations may be differentiated, as well as the context of external circumstances in which all organizations operate. Prediction and control of organizational performance or longevity cannot be achieved in the absence of criteria by which organizations may be grouped into classes, however. In other sciences such groupings are made on the basis of specific classes of controlling variables. It would seem that further work along these lines would be well worth pursuing.

Selection

Glenn and Malott (2004) do more than identify the context under which organizations operate. They also articulate the role of this context in engendering organizational change. Organizations are said to be subject to a process of cultural selection, which is roughly analogous to the process of natural selection in the biological domain. The authors claim that natural selection causes differential preservation of genetic characteristics in the lineage of a species. Similarly, cultural selection is said to account for differential preservation of aggregate product characteristics in the lineage of an organization. This analysis is somewhat unclear. Natural selection is not properly regarded as the *cause* of differential preservation of genetic characteristics. Natural selection refers as much to this outcome as to the process by which the outcome is realized. Similarly, cultural selection does not *explain* the differential preservation of aggregate product characteristics. Rather, both natural selection and cultural selection are

more properly understood as contingency relations, than as causes. The same may be said of behavioral selection. Reinforcement is a descriptive, not an explanatory, concept.

That said, the authors' contention that meta-contingencies, together with behavioral contingencies, *account for* cultural selection and the evolution of organizations requires more clarification. The same would be true were contingencies of survival said to account for natural selection and the evolution of organisms, or that behavioral contingencies account for behavioral selection and the evolution of repertoires. As we see it, the contingencies, in each case, do not *account for* the process of selection and its outcome. The contingencies *express* the relation between these processes and their outcomes.

While the distinction we are making in this regard may not seem to be an important one, we think the authors' perspective on this matter contributes to a lack of clarity as to the units subject to the process of cultural selection. To make this argument, let us return to the parallel processes of natural and behavioral selection, as articulated by the authors. In the case of natural selection, genetic entities are selected by their environmental circumstances. The relationships obtaining between these entities and their environmental circumstances are contingencies of survival. In the case of behavioral selection, behaviors are selected by their consequences. The relationships obtaining between these entities and their consequences are contingencies of reinforcement. Accordingly, in the case of cultural selection, interlocking contingencies and their aggregate products, taken together, are selected by their receiving systems. The relationships obtaining between these entities and their receiving systems are meta-contingencies.

The parallels drawn by the authors among selection processes at different levels lead the reader to assume that other similarities among these processes will be found and articulated. This does not appear to be the case, however. Instead, the authors go on to say that not only are interlocking contingencies and their aggregate products subject to cultural selection, but so also are the relations between these entities and their receiving systems. That is to say, meta-contingencies are also held to be subject to selection at the cultural level. The same is not assumed of contingencies of survival or contingencies of reinforcement. These contingencies may change, of course, but they are not the entities selected.

The argument that meta-contingencies are subject to selection at the cultural level, therefore, is somewhat confusing. Contingencies can't be both the causes *and* the effects, or outcomes, of selection processes. We don't think a reasonable solution to this problem will be achieved by deciding into which of these categories contingencies ought to fall, as neither category seems suitable. Contingencies neither account for the process of selection, nor are they outcomes of such processes. Rather, as suggested above, contingencies *express* the relation between these two.

Measurement

For purposes of argument, let us assume that the units subject to cultural selection in the organizational domain are interlocking contingencies together with their aggregate products. A unit of analysis is an abstraction, constructed by emphasizing the

commonalities among some set of events at the expense of their unique features. It is a class construction. The value of such constructions is the opportunity they afford for the performance of other scientific operations, in the present case, operations of prediction and control. These operations cannot be performed with respect to individual events. They require classes of events whose members' occurrences may be counted. It is unclear whether the units subject to cultural selection, as articulated by the authors, meet this requirement. In other words, it is unclear how individual, unique, instances of interlocking contingencies, together with their aggregate products, are collected into *classes* such that prediction and control of these classes of events may be achieved.

More to the point, it is unclear how the well-being of an organization is to be assessed. The authors do not specify what is to be measured in making this assessment, nor do they specify the appropriate metric for this purpose. Ultimately, the relative longevity of an organization among comparable entities captures its success in adapting to receiving system demands. Longevity is not a useful measure of organizational well-being, however, in that it can be measured only once, namely when the organization ceases to be. To impact the ultimate measure of organizational success, more immediate measures of adaptability to these demands must be identified. For example, an organization's profitability might be such a measure. Redundancies, disconnects, and competition among sets of interlocking contingencies and their products impact this measure. Inefficiencies and inadequacies of all sorts impact this measure.

The authors' *interpretation* of complex events is not undermined by their failing to specify appropriate variables and metrics for an assessment of organizational well being. *Prediction* and *control* of organizational well-being depends on it, though, and Glenn and Malott's prescriptions for organizational change would be more complete were they to articulate these factors.

Organization

The organization of the section entitled, "Selection in Evolving Organizations" moves from the level of natural selection to cultural selection to behavioral selection. This organization of topics produces an incomplete analysis of events at the level of individual behavior. For example, at the level of individual behavior, the authors provide an example of an accounting supervisor continuing to request reports from an accounting department that no one understands, and which thereby "have no function with respect to any other behavior in the organization." The behavior of the accounting department in producing these reports is attributed to contingencies maintained by the supervisor. The behavior of the supervisor also warrants analysis in this context, however, and in making this analysis it would become difficult to sustain the notion that these unintelligible reports "have no function with respect to any other behavior in the organization." Obviously, they have some function with respect to the requesting behavior of the supervisor. While the authors' are more than capable of making an analysis of the supervisor's behavior, to do so would entail some reiteration of the events involved in cultural selection just discussed. A similar circumstance is seen in the example of milk

processors producing more pay by diluting milk products with water. The potential for greater pay by such practices does not seem to be an individual matter, but rather one predicated by cultural contingencies. These examples of incomplete analyses of events at the level of individual behavior lead us to suggest that the topic of behavioral selection might be better placed before the consideration of cultural selection.

The organization of this section also gives rise to what appear to be implausible prescriptions for organizational change. For example, the authors suggest that interlocking contingencies and their aggregate products are subject to deliberate, direct manipulation. Changes in entities subject to natural selection occur only when environmental circumstances change, however. Similarly, changes in entities subject to behavioral selection occur only when consequences change. Hence, to suggest that entities subject to cultural selection are not wholly dependent on changes in receiving systems seems out of keeping with the authors' more general formulation. The organization of this section, we believe, is responsible for the truncation of analyses pertinent to practical applications in this field. Hence, we would suggest a reorganization of these topics in future works.

Conclusion

To conclude, we wish to acknowledge that it is a whole lot easier to comment on analyses of complicated issues made by others than to make such analyses oneself. The issues Glenn and Malott (2004) are dealing with are extraordinarily complex, and their efforts have brought considerable clarity and order to this complexity. This is a very valuable contribution, one that is likely to foster the continued well-being of behavior analysis in a rapidly changing scholarly climate.

REFERENCE

- Glenn, S. S., & Malott, M. E. (2004). Complexity and selection: Implications for organizational change. *Behavior and Social Issues, 13*, 89-106.