

TOWARD AN INTERDISCIPLINARY SCIENCE OF CULTURE

Linda J. Hayes and Mitch J. Fryling

University of Nevada, Reno

Cultural events are of interest to scientists working in many scientific domains. Given this, an interdisciplinary science of culture may provide a more thorough understanding of cultural phenomena. However, interdisciplinary sciences depend upon the validity and vitality of the participating disciplines. This article reviews the nature of scientific enterprises and problematic conceptualizations of interdisciplinary science from an interbehavioral perspective. Metasystemic and systemic foundations for an interdisciplinary science of culture are proposed.

Keywords: interdisciplinary sciences, interbehavioral psychology, cultural events, problematic conceptualizations, interbehaviorism, cultural science, subject matter, system building

While cultural events are of many different types, all involve factors of human activity and collective circumstances by which they may be distinguished from noncultural events. Cultural events are objects of study in multiple scientific domains, among them, psychology, sociology, and anthropology. Although the objects upon which investigations are focused across these domains are not the same, as members of the cultural category, they are closely related. This suggests that a more elaborate description of cultural events than would be possible to achieve in the context of any one of these sciences in isolation might emerge through an interdisciplinary approach to their investigation. Given the burgeoning of interdisciplinary enterprises across the scientific domain, this would be a valuable outcome (Hayes, 2001, 2004). This article approaches interdisciplinary science and cultural phenomena from an interbehavioral perspective (Kantor, 1958, 1982). While interbehaviorism has made relatively little impact on mainstream behavior analysis, we suggest that it offers distinct advantages over behavior analysis when applied to the conceptualization and development of an interdisciplinary science of culture.

The prospect of achieving an interdisciplinary science of culture is predicated on the interrelationship of the sciences. However, the *likelihood* of its being achieved depends on two factors, namely, (a) the strength of the participating sciences and (b) the manner in which their participation in an interdisciplinary

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Correspondence concerning this article should be addressed to Dr. Linda J. Hayes, Behavior Analysis Program, Department of Psychology/296, University of Nevada, Reno, Reno, NV 89557. E-mail: lhayes@unr.edu

enterprise is construed. Unfortunately, problems of sufficient severity to undermine the success of this venture are present in both of these factors.

An elaborate understanding of cultural events therefore awaits the elimination of these problems, and this, in turn, requires that they be recognized as such. Hence, to hasten the arrival of this understanding, our plan is to expose a number of typical interdisciplinary practices to critical analysis and to suggest what we believe is a more effective alternative for the analysis of cultural events. As a preliminary to this exposition, relevant characteristics of scientific enterprises are presented as a foundation for the development of an interdisciplinary science of culture.

Scientific Enterprises

The sciences are investigative enterprises organized for the purpose of ascertaining the nature of specific things, including their compositional structures, their operational characteristics, the conditions under which they occur and change, and their relations with other things. All sciences are alike in this regard. Moreover, given that the things subjected to investigation across these various enterprises are drawn from the same source, namely, the manifold of events comprising the natural world, all sciences are interrelated (Kantor, 1953, 1958).

Evidence of the interrelationship of the sciences is not exhausted merely in their having isolated particular objects of study from a common source. Their interrelations are also evident in their adherence to common sets of basic presuppositions. Added to these are shared investigative strategies, measurement systems, and analytical procedures, among other features. Even more obvious is their interrelationship when the types of events being investigated across their various domains are similar, overlapping, or otherwise closely related (Kantor, 1953). Such is the case of the disciplines of psychology, sociology, and anthropology with respect to cultural events.

Disciplinary Sciences

Although the relationship of the sciences as a whole is one of interdependence, as component enterprises the sciences are relatively independent (Kantor, 1953). Their independence stems from their having selected different things as their subjects of investigation. Observer (1969a, p. 515) explained, "However true it may be that every event constitutes a specialized system of occurrences abstracted out of a giant matrix of similar and dissimilar happenings, still each particular concatenation of contingencies maintains its own identity." The value of the disciplinary sciences for the enterprise of science as a whole thereby derives from their investigation of events upon which other enterprises are not focused, and the greater their accomplishment in this regard, the greater their worth. In other words, the value of scientific enterprises is measured by their productivity.

Added to this, and following from it, the sciences are cumulative enterprises, their products having evolved from the products of previous investigations of particular things. "Scientific laws when thoroughly verified are probably the most effective and valuable of all investigative products" (Kantor, 1953, p. 25). Their value is not unlimited, though. Laws pertain only to the things from which they were derived. This means that laws developed

in one science pertain only to the events investigated in that science, and not to those investigated in other sciences. This is the case because “scientific laws . . . are simply generalizations formulated from direct observation” (Kantor, 1953, p. 33). The accumulation of knowledge with respect to a given object of study therefore depends on there being a corpus of relevant products upon which it may evolve. Such products consist of investigative findings, laws, principles, and so on. Sustaining the focus of investigation on the objects isolated for special study in a particular discipline supplies the necessary foundation for this accumulation. Indeed, no factor is more important for the productivity of a scientific enterprise than consistency in this regard, and no feature of a scientific enterprise assures this consistency more effectively than a precise definition of its subject matter.

Interdisciplinary Sciences

Interdisciplinary sciences are like disciplinary sciences in all respects but one. The exception pertains to the source from which their subject matters are drawn: The special objects of interdisciplinary study are not isolated from the world of nature *de novo*. Instead, they are derived from the objects already selected for study in relevant disciplinary sciences (e.g., biology and psychology). More specifically, the subject matter of an interdisciplinary science (e.g., psychobiology) is comprised of relations between the subject matters of already existing disciplinary sciences.

The value of an interdisciplinary science in the larger scientific domain arises from the same conditions and accrues in the same way as is observed of disciplinary sciences. This is to say, the value of an interdisciplinary science is derived from its unique contribution to scientific knowledge. Its worth in this regard is therefore determined by the extent to which its investigative focus is not duplicated in other scientific enterprises. In essence, the object of study in a genuine interdisciplinary science is expressed as a relationship between the subject matters of participating disciplinary sciences (Hayes, 2004). As these *relations* are not the objects of study in any of the participating disciplinary sciences, the subject matter of an interdisciplinary science may be considered unique.

As previously discussed, the interrelationship of the sciences is predicated on the fact that they have isolated their special objects of study from the same source, namely, the matrix of things and events comprising the natural world. However, the objects of special study in interdisciplinary sciences are not drawn directly from this source. As such, the inclusion of interdisciplinary sciences in the interrelation of the sciences depends on the manner in which their special objects of study are constructed. In this regard, as long as the continuity between these constructions and those of the disciplinary sciences from which they were derived is not broken,¹ the inclusion of interdisciplinary sciences in this interrelationship is permissible.

Disserviceable Conceptualizations of Interdisciplinary Science

The fact that cultural events are investigated in multiple scientific domains underscores their complexity as objects of study. Capturing this

1 Continuity is broken when, for example, unnatural forces or entities are incorporated into subject matter constructs.

complexity requires an interdisciplinary approach to their investigation. What is taken to constitute such an approach varies, however, and the likelihood of achieving an elaborate understanding of cultural events depends on which of these variants is employed for this purpose. A common practice in this arena is to confuse collaborative investigative enterprises with genuine interdisciplinary science. More serious problems arise when fundamental characteristics of scientific enterprises are overlooked in the interdisciplinary plan. To prevent these types of ineffectual and disserviceable practices from arresting the development of a genuine interdisciplinary science of culture, several varieties of such practices, along with their underlying premises, are critiqued in the following sections.

Confusing Collaborative Enterprises with Interdisciplinary Science

As explained above, the value of interdisciplinary sciences in the larger domain of science is derived from the same conditions that determine the value of their disciplinary counterparts, namely, their unique contributions to scientific knowledge. This criterion is not satisfied in an investigative enterprise wherein the objects of special study in multiple disciplinary sciences are investigated in parallel, as is sometimes interpreted as an interdisciplinary endeavor (e.g., when psychologists work side by side with biologists). Scientific knowledge undoubtedly accumulates in the context of such an endeavor. However, it pertains specifically and independently to the objects of study under investigation in the participating disciplinary sciences, not to a novel object derived from those objects. An enterprise of this sort, while collaborative, is not genuinely interdisciplinary.

This sort of confusion is observed in the cultural arena when the behavior of groups is taken to be the subject of an interdisciplinary science of social psychology. A group is a sociological unit. However, the conduct of such a unit is not a psychological datum unless the actions of the individuals comprising it are analyzed. The actions of individuals do not qualify as a unique set of events in which both psychological and sociological features are present, though. Hence, were these actions to be investigated with the aim of understanding the behavior of individuals, the enterprise in which they would be investigated would not be the interdisciplinary science of social psychology, but rather psychology proper, and the outcome of such an investigation would pertain to the behavior of individuals, not groups. Similarly, were the statistical actions of the group to be analyzed, the outcome would be irrelevant to the behavior of individuals. In neither case is the investigation interdisciplinary in nature, as we have defined it. That is, in neither case is the object of study different from that already under investigation in the disciplinary sciences of psychology and sociology, respectively. Moreover, it does not become so even if the actions of both individuals and groups were to be investigated within the same enterprise. The study of both group and individual behavior is collaborative, not interdisciplinary.

A collection of disciplinary sciences aimed at ascertaining the nature of their special objects of study in a collaborative investigative context is not a problematic circumstance. However, it does not constitute an interdisciplinary investigation. To reiterate, the subject matter of a genuine interdisciplinary science is a unique set of events.

Compromising Scientific Boundary Conditions

The boundary conditions of a scientific discipline mark the points at which the event types with which it is concerned are differentiated from those upon which other disciplines are focused. For example, psychologists are concerned with the actions of the whole organism, whereas neuroscientists are concerned with parts of the nervous system of the organism. In other words, the boundary conditions of a discipline serve to identify its unique subject matter. Despite the fact that the value of a scientific enterprise is derived from its exclusive focus on the objects circumscribed by its disciplinary boundary conditions, a common misstep on the path to interdisciplinary understandings involves overlooking, misplacing, rejecting, or otherwise compromising the legitimate boundary conditions of the disciplinary sciences participating in such endeavors.

Unwitting compromise of disciplinary boundaries. When the boundary conditions of related scientific disciplines are poorly differentiated to begin with, their being overlooked in the context of an interdisciplinary venture may occur unwittingly. In as much as a unique object of interdisciplinary study cannot be drawn from ambiguous sources, circumstances of this sort cannot give rise to a genuine interdisciplinary science. Furthermore, even disciplinary effectiveness is compromised under such conditions. It is not possible to achieve a better understanding of events of a particular type—as may be assumed to be the investigative aim in each of the participating disciplines—in the absence of clarity about the type of event upon which one's observations are focused. For example, an understanding of psychological events cannot be achieved if biological events are investigated in their place (e.g., brain activity), as is likely to happen as a result of inadequate differentiation of the two sets of events.

Overlooking disciplinary boundaries by default. It is sometimes contended that the path to interdisciplinary study entails a deliberate ignoring or blurring of disciplinary boundaries (Glenn, 1988; Malagodi & Jackson, 1989). Proponents of this approach argue that were the boundaries of scientific disciplines not so rigidly maintained, the events defined by them would be available for investigation in more than a single discipline, therein constituting an interdisciplinary approach to their study. This argument may amount to little more than a justification for proceeding in the only way possible under acknowledged conditions of ill-defined and poorly differentiated subject matters. However, even when the subject matters of the participating disciplines are adequately defined and differentiated, this approach cannot help but result in specialists in one area operating on events with which they have less scientific familiarity and for which they are thereby less well prepared. The outcome of enterprises structured on this premise is not interdisciplinary knowledge as we understand it.

In general, the basic sciences have been more productive than their social counterparts, as indicated by their accumulation of greater bodies of coherent knowledge. Although this circumstance is undoubtedly a product of many factors, among them the development of specialized instruments and sophisticated analytical techniques, nothing has contributed to their productivity more than their consistent focus on the events identified as their special objects of study, to which they owe their internal validity. As such, their continued productivity is especially threatened by calls to ignore

scientific boundary conditions as a means of establishing an interdisciplinary enterprise, and this strategy is likely to be rejected. To put it more bluntly, this interpretation of interdisciplinary study—sometimes called crossdisciplinary (e.g., Jacob, 2008) or transdisciplinary (e.g., Rosenfield, 1992)—is more prevalent in the social than in the natural sciences, and especially so in social sciences whose subject matters are particularly ill-defined and poorly differentiated.

Compromising scientific boundaries in the cultural arena. Problems of subject matter ambiguity and definitional imprecision are particularly glaring in the interdisciplinary science of social psychology (Kantor, 1971). As Kantor (1982, p. 32) put it, “the term ‘Social Psychology’ is but a blanket to cover a tremendous number of divergent views and theories with little regard to a common subject matter.” Included in the objects selected for specialized study in this discipline are the behavior of groups, the behavior of persons under group auspices, social behavior, and the process of socialization.

It might be argued that the difficulties encountered in attempting to locate the boundary conditions of this enterprise are attributable to its interdisciplinary status. In other words, it might be said that its subject matter presents definitional problems due to the fact that it is neither sociological nor psychological in type, but is instead a unique set of events in which aspects of both of these other event types are present. This argument is not convincing, though.

Take the case of social behavior as the purported object of interdisciplinary investigation. The objects isolated for study in the discipline of psychology are identified as acts of individual organisms in relation to environing stimulation (e.g., Kantor, 1924; Skinner, 1938). Segregated from these events to form the subject matter of an interdisciplinary science of social psychology are those in which the stimulation to which organisms respond arises from other organisms.

To claim that actions stimulated from other organisms are the objects of special study in an interdisciplinary science of social psychology implies that events of this sort fall outside the subject matter boundaries of the science of psychology and are therefore not under investigation in that discipline. In other words, this approach assumes that the boundary conditions of the science of psychology are determined by the *locus* of the stimulation to which organisms respond. This factor, however, is irrelevant to the placement of these boundaries. Kantor (1982, p. 38) stated, “There is no principle in psychological science warranting the distinction between relations on the basis of the natural properties of objects to which organisms respond. The *reductio ad absurdum* of this view is to have an animal, stone, and a water psychology each to cover responses to such objects.” Disciplinary boundary conditions are not overlooked in this case, but rather improperly drawn.

Further, to claim that the interrelation of sociology and psychology is investigated in the interdisciplinary science of social psychology implies that its subject matter was derived from the subject matters of these two disciplines. Even if segregating social behavior from the data of general psychology were not based on a faulty premise, the psychological source of this datum would be obvious. However, the manner in which it reflects the subject matter of sociology is not obvious. Indeed, what is held to be “sociological” about social behavior, and therefore warrants its investigation in the context of an interdisciplinary science, is merely “social.” In short,

social behavior has no sociological properties. It is therefore not the subject matter of a valuable interdisciplinary science of social psychology. Indeed, it is merely a psychological event and one that is already under investigation in this science (e.g., Guerin, 1994; Hake, 1982; Parrott, 1983, 1986a, 1986b). This circumstance is not changed by calling social psychology a subsystem of psychology when individuals are studied and a subsystem of sociology when groups are the focus.

In sum, overlooking the boundary conditions of scientific disciplines, by default or design, is an ineffective means of attaining interdisciplinary knowledge and is ill-advised for this reason. Adopting this strategy has deleterious consequences for the participating disciplinary sciences as well. Specifically, when the boundary conditions of these enterprises are compromised, the evolution of their scientific products is interrupted, and their value in the larger scientific domain is diminished.

Overlooking the Cumulative Nature of Scientific Enterprises

Disserviceable conceptualizations of interdisciplinary science may also reflect a lack of appreciation for the cumulative nature of scientific enterprises. While disciplinary boundaries are compromised in these cases as well, the more serious problem of misconstruing the cumulative nature of science sets them apart.

Deliberate rearrangement of disciplinary boundaries. While the boundary conditions of scientific disciplines are sometimes overlooked inadvertently in ineffective attempts to gain interdisciplinary knowledge, in other cases such practices are undertaken deliberately. In the latter, ignoring disciplinary boundaries in pursuit of interdisciplinary knowledge is justified on faulty logical grounds. More specifically, proponents of this approach typically argue that because the subject matters of the various scientific disciplines were originally selected by an arbitrary procedure, no reason exists to assume that the events circumscribed by their historical boundaries are properly partitioned into these scientific divisions. The boundaries of scientific disciplines are thereby held to be subject to rearrangement without consequence. For example, Malagodi and Jackson (1989) suggested that behavior analysts overcome what is referred to as psychocentrism so as to permit their collaboration with cultural materialists in addressing issues at a cultural level. The problem with this suggestion is that the principles of behavior are applicable only to individual behavior, and thus abandoning psychocentrism amounts to abandoning the subject matter to which the principles apply. One consequence of overlooking the boundary conditions of individual sciences in the interest of promoting interdisciplinary efforts is that the products of such enterprises are inevitably misinterpreted and the validity of both of the participating sciences is compromised. It is true that the subject matters of the scientific disciplines were originally selected arbitrarily. The arbitrariness of their selection does not imply that such conditions are subject to rearrangement without consequence, however. The cumulative nature of scientific enterprises is overlooked in this argument. In other words, no matter how arbitrary the subject selection procedure, once objects of a particular sort have been selected for study in a given scientific enterprise, whether or not they continue to be the focus of investigation in that enterprise is not an arbitrary matter. Rearranging the boundary conditions

of a scientific discipline interrupts the evolution of its investigative products, therein preventing further enhancements of its value in the larger scientific domain. When boundary conditions are rearranged, products not only fail to meet the criteria for a unique interdisciplinary science but also fail to constitute disciplinary science itself.

Moreover, the fact that ignoring the boundaries of scientific disciplines is justified on the grounds that they were arbitrarily drawn to begin with suggests that a nonarbitrary procedure might have been employed for this purpose and, had it been so, no such rearrangement of disciplinary boundaries would be required for the accumulation of interdisciplinary knowledge. This argument implies that the objects of study across the scientific disciplines are independently existing realities. This is not the case, though. The objects of scientific study are products of constructional operations: They exist as constructs (Kantor, 1953, 1958). As such, their independence is a matter of definition, not reality, and their selection, therefore, could not be made on anything but arbitrary criteria. However, these circumstances have no bearing on their legitimacy as objects of study, as there are no such independent existents to replace them.

Misapplication of scientific products. Interdisciplinary knowledge is falsely configured when the objects of study in one science are understood in terms of the investigative products of another. Most commonly borrowed for such purposes are laws and principles. Because laws and principles are products of investigative and interpretive operations, their availability in a given scientific enterprise is indicative of its productivity, and productivity is the metric by which the value of a scientific enterprise is assessed. This explains why missteps of the present variety are particularly likely to occur among sciences of uneven systemic development. Both the more developed and the less developed of the disciplines participating in misguided interdisciplinary endeavors of this sort interpret the misapplication of scientific products as a means of accruing value. The less productive science, having no laws of its own, attempts to accrue value by borrowing laws from another science to account for its findings, while the more productive science attempts to enhance its value by enlarging the domain to which its laws apply (e.g., Glenn, 1988, Malagodi & Jackson, 1989). Neither science, however, succeeds in enhancing its value when scientific laws are misapplied.

Overlooked in the advocacy of such practices is the cumulative nature of scientific enterprises. Scientific products, including laws and principles, evolve from the products of previous investigative, interpretive, and system-building operations. Laws are products of constructional operations. They characterize events of a particular type by reference to their shared features, those features having been abstracted from the details of unique occurrences of that type of event. As such, they pertain only to events of the type from which they were derived (Kantor, 1953). Moreover, laws are descriptive constructions. They do not explain the events from which they were derived, much less those from which they were not.

Overlooking the cumulative nature of science in the cultural arena. The operation of a societal institution or organization, which entails the actions of multiple persons, is a case in point. Rather than make a distinctly psychological contribution to the understanding of such events, psychologists have been inclined to absorb the joint actions of multiple persons (i.e., sociological data) into their domain as though the principles of individual behavior pertained to

these events equally as well as to their own. This circumstance is illustrated when the conditions under which organizations operate are described as “discriminative stimuli” and the conditions produced by their operations are called “reinforcers.” These principles were derived from and therefore apply only to events of the psychological domain (Hayes, 1999). Although it is possible that the principles derived from the study of one type of event may share features with those characteristic of another type of event, these commonalities cannot be assumed, but instead must be discovered.

Misconstruing the Value of Scientific Enterprises

If we grant that the objects of study in all sciences are isolated from the same natural source and, further, that these selections are necessarily made on the basis of arbitrary criteria, then we must also grant that all such objects have the same status, none being more authentic or foundational than any other. By this logic, the notion that the objects isolated by one science require a foundation in those isolated by another is a fallacy (Observer, 1969b). Observer (1969b, p. 645) explained, “One of the most deeply rooted fallacies in the psychological domain is the widespread tenet that the subject matter of psychology requires the support of a biological *basis* for its existence and operation.”

As previously discussed, the value of any scientific enterprise in the larger domain of science derives from its investigation of unique events. As all scientific enterprises are focused on unique events and value is derived from this fact, all sciences are of value. How valuable they are or become depends on how great their contribution is to the understanding of particular events. In sum, the more productive a science is, the greater its value. This circumstance serves as the basis for a generally accepted hierarchical organization of the scientific enterprises, at the bottom of which is usually placed the science of physics, on which chemistry is based, on which biology is based, and so on (Kantor, 1953; Observer, 1969b). The arrangement of the various scientific enterprises in this hierarchy may be disputed from time to time, but the construction of a hierarchy on the basis of scientific productivity is not objectionable in and of itself.

Frequently, however, the basis upon which this hierarchy is constructed, namely, scientific productivity, comes to be misconstrued as a basis of another sort, fostering an undue glorification of the enterprises deemed more productive. Specifically, the subject matters of the enterprises higher in the hierarchy are held to require the support of those in lower positions for their existence and operation (Observer, 1968, 1969b). For example, psychological events may be said to be based on biological events, and biological events on chemical events, and so on.

The notion that events of one sort require a foundation in those of another is a deeply rooted fallacy that has had a damaging impact on the progress of science for centuries (Observer, 1969b). With respect to the social sciences, the basis fallacy has had the effect of diminishing investigative contacts with their legitimate subject matters on the grounds that they are fully reducible to those upon which they are based. The natural sciences have also suffered. The science of biology, for example, has squandered its intellectual and investigative resources in search of the psychological data that the basis fallacy led it to believe were located in neurological events

(Kantor, 1947). Indeed, the consequences of this abound today, as workers continue to search for memories, thoughts, and more within the physiology of the organism (Skinner, 1974). These events are psychological, however, and are not based on or occurring at a biological level. The events of other sciences may participate in the happenings of a given science, but those events do not explain such happenings.

More importantly for present purposes, when the data of a science higher on the hierarchy of scientific productivity are improperly construed as reducible to those of one lower on this hierarchy, their investigation in the context of the latter is not rightfully characterized as *interdisciplinary* in nature. Interdisciplinary study implies a search for relations between two (or more) types of authentic data. When studies with this aim are pursued in accord with the basis fallacy, only one of these data types is authentic. The other is metaphorical.

In the study of cultural events, the basis fallacy is exemplified by the suggestion that psychological events are the basis of sociological events, without which the latter would not exist. Although psychological factors are inevitably involved in every sociological situation, their participation in such situations does not preclude the existence of sociological data (Observer, 1969b). The objects of sociological study are not mere aggregates of psychological phenomena. The nature of group action, for example, is not exhausted by reference to the actions of the individuals comprising the group. A group has an organizational structure that cannot be detected in the isolated actions of its members. Hence, the contention that sociological events may be reduced to happenings in the psychological domain reflects an improper abstraction of the independent elements out of an integrated sociological situation.

Prospects for the Future

The prospect of achieving an elaborate understanding of a newly discovered, newly formulated, or otherwise previously unexamined phenomenon makes the emergence of a new department of science a momentous occasion in the life of a civilization (Observer, 1968). Such is the promise of an interdisciplinary science of culture. If the foregoing critique is valid, though, a genuine interdisciplinary science of culture has yet to emerge. More importantly, unless more adequate system-building practices than have thus far provided a foundation for the emergence of such a science come to be employed, little progress toward this end is likely to be realized.

Still, the potential value of an interdisciplinary science of culture cannot be overlooked. A great many departments of science are concerned with cultural events. Indeed, the objects of study in all of the social sciences, as well as in most of their subdivisions, involve factors of human activity and collective circumstances. An interdisciplinary science of culture holds the promise of understanding all such independent bodies of knowledge as an integrated whole. So valuable would this understanding be to humanity that efforts to formulate such a science should not be abandoned in light of the lack of progress toward this end thus far. The following section describes foundations toward the development of an interdisciplinary science of culture.

Metasystemic Foundations for an Interdisciplinary Science of Culture

Recognizing the potential value of an interdisciplinary science of culture is one thing; system building is another. Sciences are not established by fiat. They arise as ordinary curiosities about particular things and events persist over a long enough period of time for special interests to develop, and more methodical approaches to their investigation begin to be conducted (Kantor, 1966). More importantly, by nature, the sciences are cumulative and corrigible, their character changing over the course of their development (Kantor, 1953). As their methods become more rigorous and their measurements more precise, their units of analysis become more refined and their productivity increases. Further, as the products of scientific study evolve into laws, the premises upon which the science was originally erected may be challenged and subsequently modified. Because all of these changes are contingent, what a science will become over the course of its execution is impossible to predict.² As such, there is little utility in formulating the methods, measures, units, and products of an interdisciplinary science of culture in advance of its execution.

Nonetheless, the sciences are distinguished from other enterprises by their embodiment of certain general attributes. Hence, even though so much of what a new science of culture may turn out to be is unpredictable, a science of culture can at least be characterized in terms of its incorporation of these more general features. To put it another way, the sciences—both disciplinary and interdisciplinary—are defined by these features, and their incorporation in a new enterprise is required for its admission into the scientific domain. As such, some features of a new interdisciplinary science of culture, namely, those common to all scientific enterprises, may be prescribed.

In this regard, we repeat that all sciences are organized for the same purpose, namely, to ascertain the nature of specific things. All sciences are interrelated by virtue of having drawn the things upon which they are uniquely focused (directly or indirectly) from the same source, and because this source is the world of nature, all such things are equally legitimate as objects of study. Further, all sciences accrue value in the larger domain of science by ascertaining the nature of things upon which other sciences are not focused, and their focus on such things thereby affords them a measure of independence. Finally, in all sciences, the nature of their special objects of study is ascertained through a continuous, cumulative, and corrigible process. These features, we believe, may be prescribed for an interdisciplinary science of culture in advance of its execution.

Subject Matters of Participating Disciplinary Sciences

Obviously, an interdisciplinary science of culture cannot be carried out until its special objects of study have been identified. As previously discussed, the productivity of a scientific enterprise, which is to say, its value, is fostered by a coherent program of investigation, and it is only when the objects under investigation in such an enterprise are unambiguously defined that a coherence of this sort is possible. The objects of interdisciplinary study, we have argued, are relations among the objects under investigation in the participating

2 This circumstance is not altered by directing the course of its evolution, as practices of this sort engender dogma, not discovery.

sciences. The relevant sciences in the present case are those whose subject matters involve factors of human activity and collective circumstances, among them the sciences of anthropology, sociology, and psychology. Hence, in order to construe the subject matter of an interdisciplinary science of culture, the objects of study in these three disciplines must be identified.

Precise subject matter definitions are even more important to pursue when closely related disciplines are engaged in collaborative efforts, because the tendency to overlook disciplinary boundaries is greater in such circumstances. Indeed, when partial similarities among different types of events are revealed by analytical procedures, so too are partial differences among them; the greater the former, the more refined must be the discriminations made of the latter. It might be assumed, thereby, that defining operations would have particular prominence among the systemic attributes of scientific enterprises investigating events with apparent similarities to those under investigation in other domains. Put differently, one might assume that subject matter definition is particularly important for those investigating cultural phenomena.

This does not appear to be the case for the various enterprises concerned with cultural phenomena, though. On the contrary, precise definitions of the types of cultural phenomena suited for investigation in these domains are lacking, and their absence has created a great deal of unnecessary confusion. For example, in Skinner's (1971) initial call for cultural design, what is at stake is ambiguous. It is unclear whether it is the practices of a culture that may or may not survive in the absence of explicit design or if it is the culture itself that may be at risk. The former would appear to be events of the sociological domain, the latter are more likely of anthropological concern, and, interestingly, neither is of a psychological sort.

In order to pursue a new interdisciplinary science of culture in which the disciplines of anthropology, sociology, and psychology are constituents, more precise definitions of their unique subject matters, by which these enterprises may be unambiguously identified and differentiated from one another, are needed. This is not an easy problem to solve, as precision in this regard is a product of more deliberate efforts at scientific system building than has characterized these enterprises thus far. Still, unless their special objects of study are able to be identified, a plan for the development of an interdisciplinary science of culture cannot be formulated. Our aim in what follows, then, is to identify the objects of study in the constituent disciplines of anthropology, sociology, and psychology.³

Objects⁴ of anthropological study. Of the two primary branches of anthropological study, physical and cultural, our concern is with the latter.

3 The authors claim no authority with respect to the disciplines of sociology and anthropology. The subject matter definitions for these disciplines are drawn from several sources (e.g., Biglan, 1995; Guerin, 1994; Harris, 1979, 1999; Kantor, 1953, 1958, 1982; Malagodi & Jackson, 1989) and are provided solely for the purpose of exemplifying the process of interdisciplinary system building. Other characterizations of these subject matters (e.g., Bidney, 1970), provided that such were absent of nonnatural entities or processes, would serve equally well for this purpose.

4 The use of the term *objects* is not intended to imply that the subjects of inquiry in these sciences are necessarily substantive things. This term is used in a generic sense to refer to whatever aspects of the natural world constitute the investigative focus of a given discipline. In general, the sciences investigate relationships among things and/or events.

Cultural anthropology (hereafter referred to simply as “anthropology”) may be defined as the study of people as members of particular human groups, with an emphasis on the evolution of behavioral adjustments to environing things, including the products of prior adjustments (e.g., tools, ceremonials, social organization, language, art, and religion), as well as these products themselves (Kantor, 1923a, 1923b, 1958, 1982). In this definition, the properties of human activity and group circumstance, previously identified as characteristic of cultural events of all types, are clearly evident.

Objects of sociological study. We may take the objects of study in the science of sociology to be groups of people localized in specific environments, comprising whole societies or their component groupings, with an emphasis on their organizational structures and the interoperation of their components (Kantor, 1953, 1982). Unlike anthropology, where the origin of groups and the evolution of their practices and products are of primary concern, the emphasis in sociology is on contemporary groups. Similar to anthropology, though, the cultural properties of human activity and group circumstance are present in the objects of sociological study.

Objects of psychological study. The objects of study in the discipline of psychology, when approached as a natural science, have been identified as the behavior of individual organisms in relation to environing stimulation (e.g., Kantor, 1924, 1958; Skinner, 1938, 1953). Problematic in this case is the fact that events of this sort do not possess the cultural property of human activity exclusively, and lack the property of collective circumstances altogether. Isolating a subset of these objects, in which the organisms behaving in relation to environing stimulation are human beings, solves the first of these problems. The second problem is not as easily solved, as the following missteps demonstrate.

To accommodate the property of collective circumstances, one inclination is to further subdivide the objects of psychological study, such as to define cultural events of the psychological sort as those in which the stimulation to which human organisms respond arises from other human organisms, in other words, to equate cultural events of the psychological sort with human social interactions. Cultural events are not sufficiently isolated by this equation, however. The cultural property of collective circumstance is distinctive only in so far as it is *localized*, and the subset of psychological objects comprised of human social interactions includes nonlocalized or universal events, such as maternal or sexual interactions. This is to say, cultural events, while members of the class of human social interactions, have properties that not all members of this class possess. They are a subset of this class distinguished by their possession of nonuniversal properties, that is, properties unique to *particular* group circumstances (Kantor, 1982).

By way of illustration, all human organisms live in group circumstances and engage in social interactions with other humans. Some such interactions are similar across groups; some are different. For example, the social interactions of a sexual sort may be quite similar, while those of a verbal sort may be completely different. Only verbal social interactions are cultural in type by the present argument. This is not to say that psychological objects of the cultural type are necessarily or exclusively verbal. Verbal events are decidedly cultural in nature, but other types of behavior vary from group to group in this way and thereby also fit within this category (Kantor, 1982). For example, group differences are observed in their governing practices,

religious beliefs, attitudes toward women, children, or the elderly, and so on. Social and cultural events have not been adequately differentiated in the behavioral literature.

The fact that the psychological datum lacks one of the essential properties of cultural events may explain why psychologists interested in cultural events have tended to contribute to the development of an interdisciplinary science of culture in the context of a discipline other than psychology. For example, a number of psychologists have turned their attention from the behavior of individual organisms in relation to environing stimulation to the investigation of the roles played by interchangeable individuals in relation to stimulation arising from the roles played by other collections of interchangeable individuals (e.g., Glenn, 2004; Glenn & Malott, 2004; Malott & Glenn, 2006). The latter are not objects of study in the psychological domain, however. They are sociological phenomena (Hayes & Houmanfar, 2004).

This circumstance is not problematic in and of itself. What scientists elect to study, both initially, as well as at any other point in their careers, is a matter of circumstance, opportunity, and preference. Moreover, given the historical participation of the scientists in the relatively more systemic enterprise of psychology, the science of sociology stands to derive significant benefits from their involvement. As valuable as these contributions may be though, the fact remains that the investigation of sociological objects advances the science of sociology, and, given the relative independence of the sciences, advances in sociology have little bearing on the progress of psychology.

Progress in the discipline of psychology depends on the investigation of cultural events that are distinctly *psychological*. This cannot be expected to occur, however, as long as cultural events of the psychological variety have not been isolated from the larger class of social events of which they are a subset. In as much as the participation of disciplinary sciences in an interdisciplinary enterprise depends on their having articulated their unique subject matters with sufficient clarity and consistency that their interrelations with other subject matters may be ascertained, the fact that cultural events of the psychological variety have not been adequately identified does not bode well for the participation of psychology in an interdisciplinary science of culture.

Fortunately, the prospect of psychology becoming a significant player in the development of this important new science is not as poor as it might seem. A precise specification and a highly refined analysis of cultural psychological events, founded on thoroughly naturalistic premises, are provided by Kantor (1982).⁵ While presenting the details of Kantor's contribution to these matters would exceed the scope of this article, the aim of its mention may be served, at least in part, by identifying the objects of study in this domain from his perspective.

Cultural Events of the Psychological Type

The categorical constructs of Kantor's (e.g., 1958) interbehavioral psychology—through which he identifies these objects—differ somewhat from those employed by behavior analysts, however, and given that his system is

⁵ Kantor's (e.g., 1958) interbehavioral psychology is fully compatible with Skinner's (e.g., 1953) behavior analysis provided that the investigative subdomain of the scientific system of psychology is not confused with the system as a whole.

not as widely dispersed as that of Skinner's (e.g., 1953), some preliminaries to this exposition are provided for greater clarity. Our goal is to enable readers to consider the potential utility of his analysis of cultural happenings in the psychological domain.

Psychological events. In Kantor's (e.g., 1924, 1958) psychological system, the object properties of stimuli are more explicitly differentiated from their functional properties than in Skinner's (e.g., 1938, 1953) system. As Kantor (1958) described it, the object properties of stimuli are their characteristics as things and events of the natural world, as investigated in the sciences of physics and chemistry. The functional properties of stimuli are their stimulating actions, observed in the actions of the organisms with which they are coordinated.⁶ In Kantor's (1958) view, this distinction is required by the fact that a given stimulus object may be home to multiple stimulating actions or functions.⁷ Acts of throwing, bouncing, rolling, or saying "ball" may all be stimulated by the same small, round, rubber object, for example.

All people act with respect to stimulation arising from immediately present stimulus objects, wherein the formal characteristics of their responses are determined by the natural properties of those objects. For example, in picking up a cup, not just any response will be effective. It must be one with formal characteristics suited to the natural properties of a cup, including its size, shape, weight, and so on (see Parrott, 1984, for further discussion). Similarly, when lemon juice is squirted into a person's mouth, the salivating action of the person is commensurate with the chemical properties of the juice (see Delgado & Hayes, 2007, for further discussion).

People also engage in responses that have formal properties determined by the natural properties of stimulus objects when those objects are not immediately present, as when the salivating action of a person that is commensurate with the natural properties of lemon juice occurs in the absence of this stimulus. Responding and stimulating are conceptualized as a relationship in Kantor's system (1958). Hence, when a response suited to the properties of an absent stimulus object is observed, we must assume that the functional properties of that object are inhering in another, immediately present object. The substitution of one object for another in this manner is held to occur naturally as an outcome of their partial similarities of form or the spatial/temporal proximity of their occurrences in the histories of responders (Kantor, 1924, 1977; Observer, 1981). The former process is called *stimulus generalization* in behavior analytic terminology, whereas the latter refers to the process of *classical conditioning*.

In the present case, if an auditory stimulus of the form "lemon juice" had occurred historically in close proximity to the presentation of lemon juice in the mouth, the functional properties of the juice may come to inhere in the auditory stimulus, therein explaining the occurrence of salivation commensurate with the chemical properties of lemon juice in its absence. Similarly, the presence of another person in the immediate surrounds is not required for the occurrence of a social interaction. In such cases, the

6 The notion that the functional properties of stimuli are observed in actions with respect to them follows from the supposition that stimulating and responding are conceptualized as a unitary function (Kantor, 1958).

7 Skinner (1957) acknowledged this fact. However, he does not arrive at the same conclusions as to its significance in the analysis of complex events (Parrott, 1983, 1984.)

functional properties of another person may inhere in an inanimate object such as a photograph or letter, for example (Parrott, 1983, 1986a).

Cultural psychological events. Added to this, people act with respect to stimulation arising from immediately present stimulus objects or objects substituting for them in their absence, wherein the formal characteristics of their responses are not determined by the natural properties of those objects. This is to say that only some of the functional properties of stimuli inhere in their bare qualities and conditions as physical objects. Other properties of stimuli are attributed to them, and the responses coordinated with such properties are of arbitrary form. For example, a cup may be a source of stimulation for the vocal response "cup." The formal characteristics of this response have nothing whatsoever to do with the size, shape, weight, or any other natural property of the cup as a physical object. Properties are attributed to stimuli under the auspices of particular groups of people. Although the forms of responses coordinated with attributed properties of stimuli are arbitrary, they are nonetheless conventional within or characteristic of a particular group of people (Kantor, 1982). By way of illustration, the object cup stimulates a response of the form "cup" among members of an English-speaking group, "la tasse" among members of a French-speaking group, and so on.

Unlike responses coordinated with the natural properties of stimulus objects, these types of responses do not naturally emerge, nor do they become more refined by way of repeated, uninstructed interactions with stimulus objects. On the contrary, their acquisition depends on a deliberate process of enculturation in the context of specific group circumstances. In other words, an individual's membership in a particular group is defined by his or her engagement in shared responses of arbitrary form, coordinated with attributed properties of stimuli that have become institutionalized within that group (Kantor, 1982).

In summary, psychological objects of a cultural sort are identified by Kantor (1982) as responses of arbitrary form coordinated with attributed properties of stimuli that are conventional within a particular group and acquired under its auspices. The features common to cultural events of every variety, namely, human action and collective circumstances, are represented in this datum.

Systemic Foundations for an Interdisciplinary Science of Culture

The minimal design for an ideal scientific system includes the following: isolation and definition of subject matter, relevant assumptions, events selection (i.e., data, variables, and units of analysis), investigative operations, and product construction (i.e., theories, laws, and principles) (Kantor, 1953). Because the characteristics of particular subject matters influence the kinds of questions asked of them, as well as determine the means by which they may be investigated and the products of those investigations, an essential first step in the process of building an interdisciplinary science of culture is to identify its unique subject matter. As previously argued, the subject matter of an interdisciplinary science is a unique set of objects derived from the subject matters of its constituent sciences. More specifically, it is comprised of relationships among these subject matters, which, in turn, are comprised of relationships (Hayes, 2004). Accordingly, the objects of study in an interdisciplinary science of culture are relations among the relationships

under investigation in the disciplinary sciences of psychology, sociology, and anthropology.

What this amounts to is not entirely clear, however. A lack of clarity as to the relations investigated in each of these domains constitutes only part of the problem. Added to this, relations are not all of the same type, their formulations depending on the purposes for which they were formulated. That is, relations among the factors comprising the objects of study in any given scientific enterprise are construed in accord with the ends toward which their study is aimed, and these aims differ, not only across the various subdomains of a given scientific enterprise, but also between those subdomains and the enterprise as a comprehensive system. We turn, then, to a consideration of scientific aims and the types of relations to which they give rise.

Scientific Aims

The most basic of scientific aims is pursued at the level of the comprehensive system. At this level, in any given science, the aim of scientific pursuits is to construct sufficiently elaborate descriptions of its special objects of study in order to provide a basis for their explanation. Subsequent to the description of the special objects of study in a given enterprise, other aims may be pursued in their various subdomains. Of special significance for present purposes are those pursued in their investigative and interpretive subdomains, namely, prediction and control. Hence, in order to study relations among the relations under investigation in the disciplinary sciences of psychology, sociology, and anthropology, as is taken to be the subject matter of an interdisciplinary science of culture, the ends toward which this study is aimed must be specified.

Description and explanation. Descriptions are oftentimes taken to refer to the constituent factors or structural characteristics of the objects of scientific interest, rendering them inferior to explanations, in which the relational or functional characteristics of those objects are emphasized. Evident in this interpretation is not only a confusion of descriptive acts with the objects described, but also a lack of appreciation for the fact that the objects of interest in every scientific enterprise are relations. In short, descriptions, like explanations, are constructions derived from observations of the relational characteristics of particular types of objects. As such, there is no justification for sharply differentiating description from explanation: "As a rule, explanations constitute elaborate descriptions, typically those relating some event to one or many others" (Kantor, 1953, p. 34). More specifically, explaining an event amounts to describing the factors participating in it, including their constituents and the relations among them, their relations with other factors, and their integration and organization as a whole.

Explanations characterize events as presently obtaining patterns of occurrence (Parrott, 1986a). When such is the end toward which the study of particular objects is aimed, the relations among their factors are construed as interdependent in type (Kantor, 1953).

Prediction and control. Because counting operations are required for prediction and control, these aims pertain only to classes of objects. In behavior analysis, for example, individual responses are organized into operant classes on the basis of certain commonalities among them, and it is with respect to these classes, not the individual responses comprising them,

that the operations of prediction and control may be performed. Similarly, the groups investigated by sociologists and the cultures of anthropological study are organized into classes for the same purpose.

The commonalities among objects that determine how they are organized into classes vary with the purposes for which classification is intended. The identification of features suitable for prediction and control follows upon the construction of the objects of interest as dependency relations, wherein certain aspects of these objects are held to depend upon other aspects, the latter constituting the basis for their collection into classes (Kantor, 1958). The aspects of objects upon which their other aspects are held to depend are comprised of two sets of conditions: those under which their dependent aspects occur and those produced by these occurrences. Put another way, the occurrences of class members are held to depend upon the conditions present when these events take place and those present after they have taken place. The emphasis here is not to characterize events as patterns or configurations of interdependent factors, as is the case when their explanation is the objective, but rather to depict events as processes of change, from the conditions in which the events of interest are taking place to those in place following their occurrences (Parrott, 1986b).

It goes without saying that prediction and control are important objectives of scientific enterprises. Nonetheless, it must be recognized that such aims are pursued with respect to classes of objects constructed on the basis of only some of their features. Necessarily overlooked or ignored in these constructions are many other features of these objects, including such items as their unique topographies, constituent factors, and organizational structures. As such, the classes of objects investigated in any given science are not the phenomena originally isolated as their special subject matters, but rather are analogues of those phenomena constructed for particular purposes. Hence, if dependency relations between constructed classes of objects and the conditions under which they occur are analogues of the authentic subject matters of the disciplinary sciences of psychology, sociology, and anthropology, then the relations among those relations, identified as the proper subject matter of an interdisciplinary science of culture, are also analogues.

This is not an uncommon circumstance in the sciences, and as long as analogues are not confused with the objects from which they were derived, it is not a problematic one (Fryling & Hayes, 2009). Avoiding confusion in this regard means recognizing that what is discovered about analogues applies to analogues, not to the exceedingly more complex phenomena of original interest (Hayes & Delgado, 2006). In other words, what is discovered about analogues is valuable only in so far as it is referred back to the original phenomena (Kantor, 1958).

Subject Matter Definition

Isolating the subject matter of an interdisciplinary science of culture as relations among the relations under study in the participating disciplines of psychology, sociology, and anthropology is one thing; defining it is another. One of the difficulties involved in the latter, as just discussed, is the fact that relations come in different varieties depending on the purposes for which they are formulated. As such, the question arises as to which of these relation types is suitable as a defining characteristic of the subject matter of this new science.

One alternative in this regard is to formulate the relations among the relations investigated in the participating disciplinary sciences as one of dependency, whereby aims of prediction and control may be pursued. However, as multiple relations of this type are investigated in the participating disciplines, not all of which have the same characteristics, further specification as to the nature of this relationship for present purposes is needed.

By way of illustration, in the case of psychology, response class members are held to depend on stimuli. However, responses are organized into more than one class type (e.g., operant, respondent), and more than one stimulus type (e.g., antecedent, consequent) are involved in these relations, not all of which participate in relations with the same degree of dependency. For example, a greater degree of dependency upon antecedent stimuli is postulated for members of respondent classes than for those of operant classes.

Different degrees of dependency in these relations, apart from the fact that they draw dependency formulations into question, are not as important to these considerations as the fact that different *types* of dependencies are hypothesized of the relations between responses and consequent stimuli. The dependencies in this case are indirect. This is to say, response class members are held to be dependent upon conditions produced by consequent stimuli rather than by these stimuli themselves. Among these conditions are the development of discriminative properties by other stimuli (Skinner, 1953) and the modification of the responding organism's physiology (Skinner, 1974). Added to this, some responses (e.g., feelings) are not held to depend upon stimuli per se, but rather are said to participate as by-products of dependency relations involving members of other responses classes (Skinner, 1974). Dependencies of this sort are rather poorly specified (Parrott, 1983).

It seems likely that similar circumstances also prevail in the sciences of sociology and anthropology. As such, before a relation of dependency can be adopted as a defining characteristic of the subject matter of an interdisciplinary science of culture, some decision must be made as to the exact nature of this relation. Furthermore, dependency relations are, of necessity, organized hierarchically. Hence, it is not only the *type* of dependency relation that must be determined for this purpose. Also to be established are the hierarchical positions of these types of relations across the participating disciplines. In other words, if the subject matter of an interdisciplinary science of culture is to be defined as dependency relations among the relations under study in the participating disciplines of psychology, sociology, and anthropology, then the relations under investigation in two of these sciences must be assumed to depend on those under investigation in the remaining science or, alternatively, all of them must be assumed to be dependent upon some other set of conditions.

The first of these alternatives violates the premise that the subject matters of all sciences, having been drawn from the same matrix of natural things and events, are authentic in their own right. In short, it is a fallacy to assume that the subject matter of one science depends for its existence and/or operations upon the subject matter of another science (Observer, 1969b). The second alternative leaves unspecified the set of conditions upon which the relations investigated in the participating sciences depend. There are no conditions outside of the natural world upon which they could depend, however. Hence, the second alternative is just an imprecise version of the first.

For all of these reasons, we maintain that dependency relations are ill-suited as a defining characteristic of the subject matter of an interdisciplinary science of culture. Instead, we suggest that the relations among the relations investigated in the disciplines participating in this new science are most fruitfully conceptualized as one of interdependence. Conceptualizing the relations in this manner prevents unwarranted attempts to substitute the events of one science for those of another, rendering worthless to the enterprise the accumulated products of the co-opted science. Until the relations discovered in the participating disciplines are adequately and coherently formulated as empirical laws, though, the potential value of an interdisciplinary science of culture will not be realized.

Conclusion

A number of societal conditions and technological advancements have contributed to the burgeoning of interdisciplinary sciences over the past few decades (Hayes, 2001). This is a highly significant development for the scientific domain, and it is one in which all of the sciences are participating. An interdisciplinary science of culture, therefore, seems likely to emerge eventually.

An interdisciplinary science of culture draws into relation human events at multiple levels of analysis, whereby "problems are attacked in a new way, such that the results provide additional orientation and power concerning the things investigated" (Kantor, 1953, p. 6). If the scientific enterprise is successful, something new emerges. Indeed, this is the aim of all scientific enterprises.

Standing in the way of progress toward this end, though, are a number of disserviceable conceptualizations of interdisciplinary science. In addition to confusing interdisciplinary science with mere collaboration among disciplinary enterprises, collectively these misconceptions reveal a willingness to compromise the boundary conditions of scientific enterprises, revealing a lack of appreciation for the cumulative nature of science. The objects of interdisciplinary investigations are obscured by these missteps. This is not an insignificant problem. Not only are the sciences distinguished by their unique subject matters, but also their value to the scientific domain as a whole depends, explicitly, on their investigations of events that are not under investigation in other scientific enterprises. Moreover, the nature of the events isolated as the subject matter of a particular scientific enterprise influences all other aspects of that enterprise.

These circumstances apply equally well to interdisciplinary sciences. Explanations of cultural events depend on the accumulation of sufficient bodies of coherent knowledge concerning such events. However, these products of investigation and interpretation cannot arise until the events in question have been identified. In short, the emergence of a genuine, productive, and valuable interdisciplinary science of culture awaits the proper identification and definition of its unique subject matter. Our goal in this article was to provide a foundation from which a unique interdisciplinary science of culture might be pursued. Toward this end, we examined the nature and utility of an interbehavioral approach to these issues. This perspective draws attention to the difficulties entailed in the formulation of a genuine interdisciplinary science and provides guidance as to how these difficulties might be overcome.

Our aim has been to highlight the value of such an enterprise and to hasten its establishment.

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