

PSYCHOLOGICAL EVENTS AND CONSTRUCTS: AN ALLIANCE WITH SMITH

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The distinction between constructs and events is often overlooked in the sciences, as evidenced by a number of long-standing confusions of the former with the latter. The authors propose that the distinction between constructs and events is particularly important in the science of psychology, as psychological events have a number of unique characteristics that make this confusion more likely than is the case in other sciences. The nature of psychological events and the constructs derived from them are described in this article, along with the value of maintaining the distinction between them for the science of psychology and its relations with other sciences.

In a recent issue of this journal, Smith (2007) not only provided a valuable lesson on the distinction between events and constructs but also proposed a number of equally valuable rules for the scientific employment of the latter. So prevalent is the confusion of constructs with events in the sciences and so problematic are the results of this confusion for the advancement of those enterprises that further comment on these issues seems warranted. Moreover, psychological events have a number of unique characteristics that may contribute to their being confused with constructs, and this circumstance may have problematic implications for the development of behavior science. Hence, our aim in this commentary is to supplement Smith's lesson on these matters as they pertain to *psychological* events and constructs in particular.

We agree with Smith (2007) that, more often than not, psychological constructions are contaminated by impositions from cultural sources, rendering them ill suited for scientific use. Worse still are constructs without any referents in the event matrix whatsoever, where the confusion of events with constructs may be deemed complete. To Smith's argument we add that improper constructions of the events isolated for special study in the science of psychology may be attributed, at least in part, to certain features of the events themselves. Further, we make the case that even when psychological events are properly constructed from a scientific perspective, their status as constructions tends to be overlooked, with deleterious outcomes for other aspects of the psychological enterprise and its potential for effective interdisciplinary relations. In other words, even when psychological events

are constructed scientifically, they may be confused with the subject matter of the enterprise, rather than a construction derived from it. Smith proposed, in relation to this problem, "Begin all investigations with observations from which constructs may be derived; avoid starting with constructs and interpreting results in terms of these constructs" (2007, p. 179).

Before identifying the features of psychological events that may be contributing to the confusion of events and constructs in the psychological domain, a reiteration of the difference between events and constructs, as well as the necessity of the latter in science, seems important. In this regard, Kantor (1958) makes the point that the things on which scientists operate are never the original events of interest, or what he terms "crude events." In his words, "whenever the scientist brings an original event into context with scientific interests and activities (observation, experimentation) he endows it with properties additional to those it originally possesses" (Kantor, 1958, pp. 73-74). In other words, crude events are necessarily refined for scientific purposes. These refinements consist of their being identified by way of formal descriptive constructs, otherwise known as definitions. Moreover, event definitions vary with the scientific task at hand. Thus, additional refinements may be required for accommodation of the events to particular laboratory circumstances. For example, complex events may be constructed as only partial happenings or in terms of particular modes of occurrence for purposes of research (Kantor, 1958).

To reiterate, crude events are necessarily refined for scientific purposes. This is to say, scientists operate on descriptive constructions of events rather than on the events themselves. This is not a problematic circumstance in and of itself. The problems arising in this context have rather to do with the manner in which constructs are developed and how, once developed, their character is appreciated. As pointed out by Smith (2007), constructs derived from sources other than the events themselves are problematic, as is confusion of constructs with events—regardless of their sources.

Having addressed the nature of constructs and reiterated Smith's (2007) concern about the problem their confusion with events creates, we turn now to the features of psychological events that may be contributing to the confusion of events and constructs.

Psychological Events

Sciences progress at different rates, and these differences are often traceable to the kinds of things and events isolated by each as their particular subject matters (Kantor, 1953). For example, progress may be hindered when the events isolated for study are too small, too large, or too removed in space or time for unaided observation. Subjects of investigation may also be extremely rare, occurring so infrequently that their study is difficult to pursue. On these grounds, the behavior of organisms would seem to constitute an ideal subject for scientific study. Behavior is by no means a scarce commodity, and its observation is not hampered by its time of occurrence, its distance from observers, or other impediments.

Psychological events are not as ideal as they might seem, however, and there are a number of reasons why this is so. In the first place, a psychological event is not a concrete thing and thus is not amenable to metrics appropriate for things. In other words, it has no measurable size, mass, or weight. It is,

rather, a relation or function obtaining between the responding of an organism and the stimulating of an environing object, occurring in a multifactor field (Kantor, 1958). The focus on the relationship between responding and stimulation as an event does not involve relatively concrete aspects of the biological organism or stimulating object; rather, it involves acts of organisms and stimuli. For this reason, responding and stimulating per se do not easily lend themselves to common measurement practices. This characterization of the subject matter of psychological study has a number of implications and may be responsible for certain misconceptions as to its ontological status.

With regard to the latter, there is a sense among scientists engaged in the study of more concrete events that the subjects of psychological study have a mysterious, epiphenomenal quality. This is an unfortunate misconception, as it prevents effective discourse across scientific boundaries. It also reveals a misunderstanding as to the status of relations as subjects of scientific inquiry. As Kantor (1953) has pointed out, relationships are genuine events. They differ from other events only insofar as their study depends on their having first been discovered. Moreover, scientists of every variety study relations. As such, the dismissal of psychological events as epiphenomena is not attributable to their relational character per se but instead is owing to the fact that the things participating in the relations investigated in other sciences are relatively more concrete. Substance and lack of substance, however, are not dichotomous categories. More important, categories are descriptive constructions, not events. As such, their value is determined by the adequacy with which they characterize particular types of events, not by a preference for one type of event over another.

Psychological Constructs

Descriptive Constructs

That said, we may return to the unique characteristics of psychological relations and the difficulties they pose for investigation. Immediately obvious in doing so is the fallacy of localizing a psychological event in the responding organism: A function obtaining between responding and stimulating takes place in a setting, not an organism (Kantor, 1957). The setting, moreover, is not an incidental factor in a psychological event. It is an integral feature of such events, the implication being that it is impossible to identify or classify psychological events in the absence of information about the settings in which they are occurring.

Also problematic is the fact that psychological events occur not as discrete units but rather as a continuous stream of activity. In other words, where one event begins and another ends must be determined on the basis of arbitrary criteria. Arguably, the science of psychology is not alone in this circumstance. Nonetheless, the criteria on which the subject matters of many other sciences (e.g., cells, molecules, chemical elements, and atoms) are partitioned into units are more likely to be event-based than is the case in psychology. In psychology, investigators' interests constitute the basis on which units are identified (Kantor, 1953). This is why certainty as to their occurrences requires agreement among investigators, as well as speaks to the molar versus molecular debate in behavior analysis.

Additional difficulties are revealed when psychological events are subjected to analytical procedures. The organismic phase of a psychological event, for example, is conceptualized at the level of the whole organism, the implication being that it is always a complex phenomenon involving multiple response systems, including those of the muscular, glandular, sensory, and other varieties (Kantor, 1957). Numerous misconstructions of psychological events may be attributed to the fact that some such systems figure more prominently in one event than another. Thinking responses, for example, are held to be enacted by nervous systems, feelings by glandular systems, and so on. The prominence of particular reaction systems in given types of psychological events has no bearing whatsoever on the level at which psychological events are conceptualized, however. The actions of these systems, in isolation, are not events of the psychological type. They are biological participants in psychological events, and it is only on their culmination that the action of the whole organism is conceptualized, and therein constitutes the organismic phase of a psychological event.

The stimulatory phase of a psychological event is also a complex affair. As Kantor (1953) has pointed out, a function cannot obtain between the responding of an organism and an inert object. A function requires symmetry in the participation of its elements. This is to say, the concept of function, as employed in the sciences, is derived from events having the property of participatory symmetry. Accordingly, it is the stimulating of an object, not the object itself, that participates in functions of the psychological type.

This conceptualization of the stimulatory phase of a psychological event is rarely employed, however. Generally speaking, psychologists do not distinguish the stimulating action of an object from the object constituting its source (Kantor, 1970), a problem Kantor (1947) attributes to their having borrowed this term from biology, where the distinction between objects and their stimulatory properties is less critical. This is not a trivial problem for the discipline of psychology, though, as failing to make this distinction inevitably results in the misconstruction of psychological events, particularly those of the most complex varieties (Kantor, 1924, 1926).

For example, when the object sources of stimulation for responding are not present, as in imagining, the interpretive problem posed by such occurrences tends to be solved by contending that responding is occurring in the absence of stimulation (e.g., Skinner, 1974). The problem with this solution is that responding in the absence of stimulation is not a psychological event. It amounts to abandoning the psychological domain (see Parrott, 1986, for discussion). Little wonder, then, that an explanation for events of this type is sought elsewhere, typically in the brain. Not the brain as currently understood, however, as evidence of the sorts of entities and processes necessary to complete this account has yet to be demonstrated. On the contrary, it is held that the answers to our questions will be found in the brain of future understandings (Skinner, 1974). Not only does this hope for the future reflect a misunderstanding of the participation of biological happenings in psychological events, but it also misconstrues the events of the biological domain (Kantor, 1947).

By contrast, conceptualizing the stimulatory phase of a psychological event as the stimulating action of an object prevents missteps of this sort. Constructed in this way, the stimulating action of an object does not depend on the object's presence. The independence of stimulation from objects of

stimulation is a product of a particular set of historical and current conditions, however. More specifically, a history of responding with respect to stimulating from multiple source objects under conditions of their association, coupled with the immediate presence of at least one of those objects, is required for such occurrences. Given these conditions, the stimulating actions arising from historically encountered source objects may operate by attachment to the one such object that is currently present. In other words, an organism may respond with respect to object B in the presence of only object A, given historical conditions of those objects being associated in space or time, the implication of this being that the stimulating action of an object (B) does not depend on the presence of the object, such that organisms may respond with respect to objects that are not physically present.

Stimulation operating from nonoriginal sources by virtue of historical circumstances and current conditions of these sorts is deemed substitutional in kind (Kantor, 1958). A coherent interpretation of complex psychological events of the imagining, remembering, thinking, and similar varieties is enabled by the construct of substitute stimulation, thereby eliminating the need for a compensatory foray into hypothetical biology. In short, if inadequate construction of psychological events is the problem, then adequate construction is the solution.

Finally, psychological events are corrigible, becoming more and more elaborate over the course of their development. The event observed in present circumstances marks the point to which it has evolved over the course of its interbehavioral history, as appropriate to those circumstances (Hayes, 1992). To put it another way, the event observed in the present entails its history in relation to the current setting.

Descriptive constructs are derived from psychological events as they are observed to occur naturally or, otherwise put, in the absence of deliberate manipulation, and in these constructs is represented their features of historicity and context dependency. These features of psychological events foretell of investigative difficulties: They imply that the events initially selected for investigation are likely to evolve into different forms over the course of their investigation. Likewise, all of the characteristics of psychological events thus far described place extraordinary demands on systems of investigation. Such systems must be capable of detecting the evolution of functions—involving the participation of multiple response systems in ever more elaborate forms of responding with respect to ever enhancing stimulatory properties of objects, many of which are substitutional—in the presence of continuously reconfiguring fields of setting factors, as well as be capable of manipulating those events and their patterns of occurrence.

This is a tall order. Too tall, in fact: No science, including psychology, undertakes this task. Scientists do not investigate events as represented in descriptive constructions.

Descriptive constructions are ill-suited for such purposes. Investigation requires its own set of constructs, to which we now turn.

Investigative Constructs

Generally speaking, investigative constructs are more removed from the original events than are descriptive constructions. They are derived from the latter and are continuous with them but also frequently make reference

to the methodological propositions of investigators. These propositions refer to the activities of investigators and the results of those activities, including such things as identifying materials for investigation, determining phenomenal units, selecting metrics, choosing variables, formulating hypotheses, and so on.

Skinner's (1953) concept of the operant is an example of an investigative construct. According to Skinner (1969, p. 131), "An operant is a class, of which a response is an instance or member. . . . It is always a response upon which reinforcement is contingent, but it is contingent upon properties which define membership in an operant. Thus a set of contingencies defines an operant." This construction is a product of pragmatic considerations with respect to the circumstances and aims of investigation, as well as a reflection of the author's premises concerning the nature and role of particular factors in psychological events. Skinner (1953, 1974) recognizes the need to simplify the events of original interest for purposes of investigation.

Further simplification is achieved by focusing solely on the quantitative features of responding. This is justified by its utility in fulfilling one of the aims of investigation, namely event prediction. More specifically, Skinner (1953, 1957) focuses on class member frequency over time, or rate of responding, as a mean of assessing operant probability.

The other aim of investigation, namely control, is achieved by interpreting setting factors as stimuli to the neglect of the latter and their coordinated responses. A factor (e.g., a tone) antecedent to the observation of a psychological function is interpreted as a stimulus, as is the factor (e.g., food) introduced upon the occurrence of this function. As a stimulus, however, the tone stimulates hearing responses, the food, eating responses. In short, with respect to the lever-pressing function, the tone and food are setting factors, not stimuli (see Parrott, 1987 for further discussion).

The confusion of setting factors and stimuli in this account undermines consideration of the genuine stimulatory participant in such a circumstance, namely that inhering in the lever. The lever, as such, is conceptualized as a mere operandum, an aspect of the apparatus, with no paradigmatic significance. Obscured by this confusion is the fact that a stimulus object may be a source of multiple stimulus functions, among which, in the case of the lever, may be those coordinated with responses other than pressing it.

The substitution of setting factors for stimuli in this account impacts the manner in which the events of original interest are conceptualized. It leads to the conclusion that antecedent stimuli exert control over operant class member occurrences and that consequent stimuli are responsible for the strength of operant classes. This is to say, dependency relations between responses and stimuli are constructed: Stimuli are held to control, influence, elicit, or otherwise cause responses to occur.

By contrast, when the tone and food in such circumstances are properly interpreted as setting factors, they may be understood as participating factors in an integrated field wherein a particular function of responding with respect to stimulating is taking place. In other words, they may be seen as aspects of the events under investigation, not as independent causes of them.

This is not to say that dependency constructions are without value or utility. They serve important analytical purposes in investigative circumstances, namely prediction and control, and are commonly employed for this reason. In an investigative context, it is reasonable to contend that setting factors, including conditions of the organism as well as the presence of certain environing

conditions, influence the occurrence or nonoccurrence of particular psychological events. Still, as Kantor (1958, p. 89) explains, dependency relations are justified only for operational purposes and “do not imply that the events are structured on such a basis” (1958, p. 89). Ultimately, factors isolated out of event fields for pragmatic purposes must be handled with reference to the fields from which they were drawn.

What actually occurs in investigative circumstances reflects the merits of Kantor's proposition in this regard. Because the responses implicated in dependency relations constructed under investigative circumstances do not always occur, their occurrences are not fully accounted for by the $R = f(S)$ formulation. This circumstance is remedied by the construction of additional dependencies (see Morris, 1992, for related discussion). For example, the dependency of responses on stimuli is said to depend further on the presence of other stimulus objects (e.g., conditional discriminative stimuli), the presence of derived properties of stimulus objects (e.g., transferred functions), or prevailing conditions of a broader sort (e.g., contextual variables, setting factors, audience variables). Added to these are dependencies invoked by motivational conditions of both environing (e.g., conditioned establishing operations) and organismic sorts (e.g., food deprivation), as well as other factors of a more ambiguous (e.g., genetic makeup) or hypothetical nature, as in Skinner's (1971, 1974) notion of physiological changes as a function of reinforcement. Once all such factors have been taken into account, a function of responding with respect to stimulating may be attributed to the entire field of factors in which it is obtaining. This is to say, “causality” may be interpreted as the total event field (Kantor, 1950), in which the function of responding with respect to stimulating is not the effect but, instead, the focus (Hayes, Adams, & Dixon, 1997).

Conclusions

In summary, we reiterate our agreement with Smith (2007) that the confusion of constructs and events is both exceedingly prevalent in the sciences and highly disserviceable to them, and our examination of behavior analysis reveals evidence of this same problem. With regard to behavior science in particular, we contend that confusing events and constructs, as well as confusing constructs of one sort with those of another, fosters incomplete coverage of the relevant subject matter of this enterprise, undermines the aims of interpretive practices, and obstructs effective interdisciplinary relations. For purposes of illustration, we examine these confusions in the treatment of memorial events.

With regard to the first of these problems, the confusion of the operant class construct with the events of original interest circumscribes the range of events investigated to include only those amenable to frequency metrics. For example, acts of memorizing are investigated to the neglect of remembering and reminiscing despite the fact that, relative to these other forms of memorial activity, memorizing is of relatively little interest.

The confusion of events and constructs further impacts the interpretation of the events actually investigated, as well as misconstrues their relationship to the events of original interest. In this case, constructs developed for investigative purposes (i.e., operant classes) are confused with descriptive constructions. As a result, the events of original interest in the memorial

category, namely remembering and reminiscing, are interpreted in terms of the relations demonstrated in the investigation of memorizing or other repetitive performances.

Finally, the potential for behavior science to enter into effective relations with other scientific enterprises is diminished by failing to maintain the distinction between events and constructs. More specifically, effective interdisciplinary relations are undermined by failing to maintain the distinction between descriptive constructs and those developed for investigative purposes. Unlike descriptive constructs, where the aim is to keep as close to the events as possible, investigative constructs reflect discipline-specific constraints on event manipulation, typically reflect only partial happenings, and tend to characterize such happenings in singular modes of occurrence (Kantor, 1958).

As such, the objects of effective interdisciplinary study are not relations among the investigative constructs derived by the participating disciplines for their own purposes. They are, rather, relations obtaining between the events isolated by each as their unique subject matters, represented in descriptive constructions. Hence, a useful collaboration between the sciences of biology and behavior science with respect to the nature and operations of events will not be achieved by investigating relations between descriptive construction of the relevant biological events and investigative constructions of the behavioral events. Failing to distinguish descriptive constructions from their investigative counterparts, whereby the latter are substituted for the former in interdisciplinary work, cannot help but undermine the success of such ventures.

In sum, we agree with Smith (2007) that the distinction between events and constructs is of the utmost importance in the sciences. Moreover, we contend that the distinction may be particularly important in the psychological domain, given the unique features of psychological events. The aim of behavior science is to understand the events comprising its unique subject matter, and progress in this regard will not be achieved until the distinction between events and constructs is fully appreciated.

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