

Mentalistic explanations of organismic behavior: Fact or fiction?

Review of Sam S. Rakover (2018). How to explain behavior.

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A critical review

The author's aim in writing the book is to provide a new approach for understanding the internal conscious experiences that cannot be explained by existing scientific approaches. The book begins with a critical review of the concept of scientific explanation in the natural sciences and in psychology. Basically, the author maintains that the natural sciences employ models of mechanistic explanations which properly account for the variety of natural phenomena, but cannot account for inner mental processes that presumably guide humans' and superior animals' behaviors. He therefore suggests that the mechanistic, causal explanations of organismic behavior be complemented by mentalistic, teleological explanations. Behavior of higher organisms is thus not only pushed by causal factors, but it is also pulled by purposive will and belief.

The author begins by distinguishing two related concepts: Mechanistic explanation and mentalistic understanding. Explanation is based on objective, scientific research methodology, particularly empirical experimentation, whereas understanding is based on subjective experiences, accepted knowledge, analogies, metaphors and authoritative opinions. The former employs real units of measurement (of length, weight, volume, etc.), whereas the latter employs hypothetical units of measurement (of pain, loudness, time, etc.). This linguistic distinction is, however, theoretical, since in practice the author uses the term explanation in regard to both, mechanistic and mentalistic concepts and procedures.

The introduction is followed by a review of nine models of explanations that are commonly used in the natural sciences: The deductive-nomological (two true premises followed by a conclusion), the deductive-statistical (the deductions are probabilistic), the inductive-statistical (predictions are inductively inferred), the statistical-relevance (predictions are based on two probabilities), the causal-mechanical (explanations are based on causal interactions), the manipulationist-interventionist (based on assumptions regarding what would have happened had things been different), the kairetic (based on difference-making causal factors), the unificationist (based on unification of a large number of observations), and the pragmatic (where questions and answers are context dependent).

Analysis of these models shows that none of them is applicable as an explanation for the social sciences, because human behavior is governed by human-made rules rather than by natural laws. The two differ from each other in terms of universality (natural laws are universal - nomothetic, whereas human rules are specific - idiosyncratic), exceptions (behavioral rules, but not natural laws, have exceptions), consciousness and arbitrary changes (that are relevant solely for rule-abiding behaviors), causality (pertinent solely to natural laws), and subjects of discussion (energy and properties in natural laws; information in behavioral rules).

Rule-abiding explanations are complemented by teleological explanations which are conceivable either in terms of will and belief (where conscious representation of the goal precedes action), or in terms of function (where conscious awareness is not mandatory). Finally, behavior may be explained in terms of mechanisms of information processing phrased in terms of content rather than in terms of physical features. Acceptance of behavioral explanation of the unknown real

mental process depends on the outcome of empirical testing which, when successful, lends support to the theory on which it is based.

In Rakover's view, the mentalistic procedure of teleological explanations, in terms of the individual's will and belief, meets the scientific methodological requirements by choosing a theory, making a prediction, running an experiment, matching prediction and observation, and drawing a conclusion as to whether the prediction is confirmed or disconfirmed. Therefore, whenever existing theories cannot explain subjective conscious experiences (feelings, perceptions, thoughts), mentalistic explanations should be entertained.

Mentalistic explanations are necessary because mental states are irreducible to psychophysiological states (as Identity Theory suggests), and consequently mental processes cannot be accounted for in terms of mechanistic explanations. The need for mentalistic explanations is most conspicuous in the study of consciousness which is disregarded by behaviorism and by physiological psychology. However, although the mentalistic explanations of behavior, the so-called folk psychology, fulfill the requirements for scientific methodology, they are not scientific. In Rakover's view, teleological explanations in terms of will and belief, as employed in folk psychology, are not "a kind of law or scientific theory, but a scheme for explanation by means of which specific teleological explanations of specific behaviors are produced" (p. 174). Folk psychology concepts are not affected by empirical results, cannot support counterfactual situations, and lack explanatory power. They are often ad-hoc, incomparable to alternative explanations, and lack reliable and valid measurements as well as internal consistency. In the final analysis, they constitute a procedure for producing teleological explanations, and they should therefore be entertained only when the mechanistic explanations fail to account for a given behavior.

Inconsistency of mentalistic explanations impairs predictions, and invalid measurements impair empirical testing, yet for Rakover these shortcomings are not reasons for disqualifying them, because, reflecting the person's very essence, the mentalistic explanations of conscious processes are understandable to the individual. However, these serious shortcomings - lack of empirical support and predictability - are clearly reasons for disqualifying the mentalistic explanations, and the feeling that behavior is understood by the individual does not constitute a proof that it is truly explained.

The book ends with an original proposal for a general explanation procedure for understanding individual's behavior. As the procedure follows the scientifically-valid hypothetico-deductive method, it is suitable for providing empirically tested explanations. These explanations approximate the Unknown Real Processes (which is absent in the hypothetico-deductive model) that initiate the behavioral phenomena under study. The author is aware of the limitations of the suggested procedure; namely, that the various mentalistic models employ different rationalities, that the theoretical and observational concepts are distinguishable from each other, that the theoretical concepts are linked to the real world, that some explanations do not yield predictions (which when confirmed is not a proof for the veracity of the explanation), and that there is no way to measure proximity of a given theory to an Unknown Real Process.

Comments

A general comment

The book constitutes a systematic presentation of a controversial concept of a teleological explanation of humans and other superior organisms by invoking the folk

psychology concepts of will and belief. The author is aware of the fact that by doing this he is going against the current trend of turning psychology into a scientific discipline by employing scientifically valid conceptualizations and methodology. Employment of mentalistic explanations whenever mechanistic explanations fail is appealing, as they fulfill the void created by unexplained behavioral acts. The question is, however, to what extent do these explanations contribute to the understanding of behavior. In light of their drawbacks which are honestly admitted by the author, there is no definite answer to this question. Consequently, mentalistic explanations are not universally acceptable, and personal feeling of understanding might have no explanatory value.

The mind/body problem

The author continuously refers to the mind/body problem as an issue that has so far evaded solution. He argues that he circumvents this issue by offering a multi-explanation framework where mechanistic and mentalistic concepts interact. The mind/body problem has confronted humanity from time immemorial, and as Rakover points out, so far it has not been solved; apparently because it is in principle unsolvable. The issue concerns the nature of the interactive link between mind and body. Do they run in parallel, or perhaps one aspect is dominant over the other (and if that is the case, which aspect is the dominant factor in the interaction). There are two basic approaches to this issue; monistic (mind and body constitute a single entity) and dualistic (mind and body are two distinguishable entities); each approach is subdivided in turn into a number of sub-categories. Consider, for example, emotional behavior. Clearly, mental responses (fear, joy, anger, and the like) are correlated with bodily responses (a rise in the galvanic skin response, accelerated heartbeat, and the like), but the correlation might indicate either that the mind affects the body, or that the body

affects the mind, or that both are simultaneously affected by a third factor. Moreover, while a rise in the galvanic skin response indicates a rise in emotionality, it tells nothing about the quality of the emotion. Equally intensive positive and negative emotions are accompanied by an equal rise in physiological responsiveness. Thus, while the mechanistic bodily processes may indicate the very existence of mental psychological processes, they tell nothing about their emotional qualities. Law enforcement agents, who routinely use physiological measures (such as the galvanic skin response) as indices of lies, are aware of the fact that these measures only indicate the level of the suspect's emotional responses to the questions asked, and that a rise in these indices is interpreted as showing that the verbal answers are lies only by analyzing the content of the verbal question that preceded the rise and the answer that accompanied it.

By definition, science deals solely with matter which can be manipulated and systematically tested. Mechanistic concepts - such as physiological, hormonal, chemical and neuronal processes - are therefore legitimate subjects for scientific explorations. By contrast, mentalistic concepts - such as consciousness, will, soul and belief - are immaterial, and as such are not amenable to scientific inquiry. Consequently, mentalistic concepts have altogether been avoided by scientifically-minded psychologists who consider psychological research a scientific endeavor. Mentalistic concepts that are employed by clinically-oriented psychologists and by folk psychologists are considered unverifiable, and therefore unscientific. By definition, the mind has no material qualities (such as measurable dimensions), and as such it cannot be scientifically studied. As a matter of fact, the very existence of the mind is controversial, as some thinkers argue that it is nothing but the brain (for a neurosurgeon's view on this issue, see Penfield, 1975).

Indeed, the idea that mental functions can be reduced to their bodily substrate (the reductionist approach) has been entertained, but as Rakover points out, it has been rejected - rightly so, because, as shown above, bodily processes can indicate the existence of mental processes, but they cannot explicate their psychological properties.

The most extreme attempt to get away from the unobservable, unmeasurable concepts has been carried out by the behaviorists who, considering all mental properties a "black box", dealt solely with overt stimulus and response relationships. Their approach led, however, to poverty of psychological understanding because it left out inquiries into the most important cognitive and emotional processes. The "cognitive revolution" which followed showed that conscious functions can be operationally defined and empirically tested (left out, however, are those mental properties that cannot be operationally defined and tested; namely, will and belief).

The field of neuropsychology focuses on brain-behavior relationships. As a scientific discipline it does not address issues related to mind/brain relations, but effects of brain processes on consciousness have been considered. This is true particularly in respect to split-brain conditions where the anatomical connections between the two cerebral hemispheres are surgically severed by cutting the corpus callosum that transmits cortical neuronal impulses from one hemisphere to the other. Specifically, a question arose as to whether a patient who has two disconnected cerebral hemisphere has one consciousness or two (Pinto et al., 2017). Sperry (1984) even discussed the effects of split brain operations on the self.

In the present book Rakover tries to address this issue by arguing that, despite the fact that will and belief cannot be scientifically studied, they can nonetheless contribute to the understanding of human behavior whenever the scientific, mechanical explanation fails. In short, Rakover suggests that we introduce concepts taken from

the non-scientific folk psychology to the legitimate discourse of accounts for human behavior. In a nutshell, he argues that although mental processes, such as will and belief, cannot be objectively and reliably defined and measured, inasmuch as they follow sound scientific methodologies of formulating testable predictions, they are acceptable explanations of behavior. These explanations are not objectively formulated. Rather, they are formulated in terms of subjective understanding which is intuitive, idiosyncratic, inconsistent and unverifiable. As pointed out above, Rakover distinguishes between objective (scientific) explanations of natural phenomena and subjective (folk) understanding of unknown mental processes, but subsequently he uses the term explanation for both mechanical and mental processes, thus intentionally or unintentionally legitimizing folk concepts as explanations of human behavior.

In his book "Thinking fast and slow" Kahneman (2011) thoroughly discusses intuitive decision making, showing that while at times it may be valuable, it often leads to bad decisions characterized by a host of typical judgmental errors. In light of his findings one may wonder whether it is reasonable to rely on intuitive understanding that is based on personal experiences, prejudices and beliefs, as an explanation of behavior.

Rakover's proposal of a general explanation procedure for understanding individual's behavior, backed by methodological dualism and a multi-explanation framework, is indeed bald, because it runs against the scientific ethos in the social sciences in general, and in psychology in particular. Whereas the ethos calls for scientifically sound methodologies and theories of human behavior, Rakover suggests that we adopt those which are clearly nonscientific. Alternatively, one may admit that essential mental concepts, such as will and belief, cannot be used as explanations of behavior.

My hesitation concerning Rakover's proposal is bolstered nowadays by my personal observations of Mr. Donald Trump, the current president of the United States. His unexpected actions and utterances are continuously monitored and interpreted by both his supporters and opponents who provide opposing explanations of his behavior. For each group Mr. Trump's behavior makes sense (is understandable) in light of his past activities and it is likely to predict his future moves. But the explanations of this behavior by members of the two groups are polarized. Which explanation should one adopt? Wouldn't it be better to admit that while the seemingly sound, consistent speculations make sense, we do not really know what motivates Mr. Trump in any given act that he performs? Perhaps we should learn from our physicist colleagues who admit the existence of given physical phenomena which are unexplainable within the framework of the quantum theory, and like them admit that some mental processes are, and perhaps will forever be, unexplainable (for further discussion of brain/mind and related issues, see Massaro [in press]).

Human and animal behavior

Time and again Rakover stresses that mentalistic processes, such as purposive behavior, are not uniquely attributed to humans, since they also characterize superior animals. Specifically, he discusses the purposive behavior of his cat, Max, whose behavior, he maintains, can be fully understood only by invoking the notion of functioning mental processes. However, nowhere does he define what he means by superior animals, and what are the demarcation lines between them and humans on one hand, and between them and lower animals on the other hand. Pertinent questions therefore remain unanswered. For example, does Max have beliefs similar to humans? Do rats have consciousness? One expects that a ubiquitous theory, such as the one suggested by the author, should provide answers to these and to similar questions.

One of the problems involved in studying nonhuman behavior refers to the tendency to attribute human qualities to lower animals (anthropomorphism). This tendency constitutes no problem for folk psychology where anthropomorphic terms are readily accepted ("my dog loves me"). However, in formulating theories in the social sciences one is duty bound to abide by the dictum of Occam's razor whereby whenever alternative explanations are available, one should choose the simplest possible one. Thus, if a given behavior is explainable in terms of unconscious stimulus-response relationship, one should not prefer an explanation in terms of higher, consciousness processes. Rakover seems to be aware of this dictum, as he suggests that mentalistic explanations should be employed only when mechanistic explanations are unsatisfactory. Nonetheless, the special status of superior animals and their attributes are not thoroughly discussed.

Consider the following example of the difficulty involved in applying mentalistic explanations to nonhuman organisms which comes from studies on the theory of mind (ToM) in animals. ToM refers to the ability to attribute mental states (such as intentions, desires and knowledge) to oneself and to others which in humans develops with age (Kushnir, 2018). Studies of ToM in animals employ a variety of techniques, such as the false belief test. In this paradigm one person hides an object in view of another person in full view of the animal. The second person then leaves the room, and the object is removed. That person returns and looks for the object where it was originally placed. If the animal fixates its gaze on this location, it suggests that it expects the person to believe that the object is still hidden in that place (Smith, 2016). Studies on ToM have been conducted not only on superior animals, such as chimpanzees and other primates, but also on birds, dogs, pigs and goats. However, explanations of animals' behavior in terms of theory of mind remains

controversial, as attested by Heyes (2015) who, reviewing 35 years of research on mindreading in animals, concluded that there is no agreement on the existence of ToM in any animal. Critics of the notion of ToM in animals argue that the experimental setups cannot distinguish between ‘mind readers’ and ‘behavior readers’, that the pertinent studies are not properly controlled, and that data interpretation is intuitively biased in favor of attributing cognitive functioning where other interpretations are possible.

In light of this state of affairs, Rakover's suggestion that purposive behavior is attributable to superior animals seems a bald attempt at reversing the direction of current scientific conceptualization.

Measurements and empirical experimentation

One of the major differences between the natural and the social sciences, according to Rakover, lies in measurement units. In the former they are real, precise and universally accepted (e.g., the meter as a measure of length), whereas in the latter they are hypothetical, imprecise, and not universally accepted (e.g., IQ as a measure of intelligence).

Rakover's argument is valid. In psychology there is no agreement on the definitions of the most important variables; such as aggression, personality, psychopathology and intelligence. Definitions are intimately linked to the measures of the concept which differ among the researchers. For example, the definition of intelligence heavily depends on the specific questionnaire used to measure it. Thus, Wechsler's (1939) and Gardner's (1983) theories of intelligence differ in both, measurement and definition. This state of affairs makes comparison between competing theories virtually impossible, as differences in experimental outcomes may be artifacts of methodological differences.

Perhaps the most conspicuous mental concept that defies objective measurement is pain. There is virtually no way of measuring pain intensity in humans other than by invoking verbal responses by the suffering individuals. Pain measurement is therefore idiosyncratic as it is verbally estimated by each individual. Consequently, sensations of pain are not comparable across subjects. Thus, attributing the number 5 on a scale of pain ranging from 1 through 10 may indicate quite different estimated intensities by different individuals.

Finally, a comment on the status of empirical testing is in order. Its role in mentalistic explanations is unclear. On one hand, the author maintains that in order to be accepted, the explanations require empirical support, and that the hypothetico-deductive method used for testing mentalistic predictions is suitable for providing empirically tested explanations, whereas on the other hand he argues that folk psychology concepts are unaffected by empirical results. Clarification of this apparent contradiction is called for.

Summary, final analysis and conclusion

The author's purpose in writing the book was to offer new methodology (methodological dualism) and theoretical framework (multi-explanation framework) for the explanation of human- and supreme animal-behavior that cannot be causally accounted for in terms of mechanistic explanations which are valid in the natural sciences. For that purpose he first systematically critically reviewed existing models of explanations, showing that, lacking mind/body theories, they cannot account for mental inner processes. Toward the end of book the author spelled out in detail his own solution for the dilemma of explanation of mental processes.

Marr (1982) suggested that complex systems, such as the brain and human behavior, be analyzed on three levels; computational (specification of the problem),

algorithmic (method to solve it) and implementational (the mechanism for performing the algorithm). Although Marr's original suggestion referred to biological systems (such as vision), his levels of analysis seem to be applicable for Rakover's methodology and theory. On the computational level Rakover made a remarkable, detailed exposition of the problem involved in accounting for the innermost mentalistic processes that are not amenable to scientific inquiry. Similarly, on the algorithmic level he systematically analyzed the various methodologies employed for the study of behavior, finally pointing to the hypothetico-deductive method as suitable for testing mentalistic hypotheses. The problem with Rakover's suggestion arises in regard to the third, implementational level of analysis, since there are no specific, universally accepted physical or mental mechanisms for the implementation of the proposed algorithm. Subjective, idiosyncretic feelings clearly cannot be used for confirmation or disconfirmation of hypotheses.

The arguments are eloquently presented and richly accompanied by supporting data as well as by thought experiments. At times the author resorts to dialogical style. Regarding the convincing power of his arguments, well, this lies in the eye of the beholder. This sounds an appropriate conclusion considering the author's admittance that in the final analysis, mentalistic understanding is idiosyncratic.

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