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The Origin and Evolution of Interbehavioral Psychology

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ABSTRACT

Autobiographical notes of J.R. Kantor with special emphasis on the origin and development of Interbehavioral Psychology.

RESUMEN

Notas autobiográficas de J.R. Kantor con especial hincapié en el origen y desarrollo de la Psicología Interconductual.

I. Origins

Effectively to muster the intimate conditions concerning one's intellectual career is not only difficult, but also fraught with glaring uncertainties. It is not a simple matter precisely to pinpoint the detailed circumstances that contributed to the development of particular attitudes and directions of thinking. Was that not why Goethe, at least in part, entitled his life story *Aus Meinem Leben: Dichtung und Wahrheit,* while Wundt called his autobiography *Erlebtes und Erkanntes?* And is not this the reason that the *Confessions* of the archself-inquisitor Rousseau came to be regarded as the fabrication of doubt and delusion? Be all this as it may, I am attempting in this paper to comply with the suggestions of my friends and students to review some of my efforts to foster the development of interbehavioral psychology, which I believe is a step forward for psychology in the pathway toward natural science.

When and how did I become imbued with the notion that psychology was in need of moving away from its anchorage in myth and legend? The

time, I am confident, was early in my study of the validity and utility of the subject. It may be assumed as a matter of course that dissatisfaction with orthodox psychology must have originated in deep-seated critical attitudes developed in early youth.

As it happened, my intellectual development began in a complex of events which facilitates the early and serious maturation of the progeny of families recently arrived from foreign shores. On the one hand, one was made to suffer the slings and arrows originating in the xenophobia of an already ensconced population, but on the other, there was the advantageous privilege of being able to compare and contrast the political, economic, social, and religious institutions and practices of different cultures. There is hardly a doubt that my multiple culturalization engendered traits of observation, of critical comparison, and an urgency to correct what appears to be undesirable intellectual institutions. While growing up I could not fail to observe the incongruities and discords arising from differences in traditional beliefs, cultural rituals, diverse social relations, and economic opportunism. The particular outcome of the circumstances mentioned was an early deep-seated naturalism in the sense that knowledge and intellectual orientation in general can only be based upon direct observation of the way things and events actually existed and changed by virtue of their specific coordinate circumstances.

Quite early in life I began to realize that the hiatus between 1) beliefs and assertions and 2) events, was the source of ignorance and delusions that led to conflicts between individuals and groups. When I first ventured into academic precincts, my primary interest was in the sciences. It was my deep conviction that the scientific procedures of free and untrammeled investigation were the essential prerequisites for understanding humanistic, social, and linguistic events and institutions, as well as the things and events of inorganic and organic nature. Furthermore, it became evident to me that much of the currently prevailing wisdom consisted primarily of traditional pronouncements, and in no sense was based upon direct confrontations with events.

By a curious coincidence, I, like J. B. Watson at an earlier date, entered the University of Chicago with Philosophic interests, though of a very different type. Watson proposed to study conventional philosophy with John Dewey, whereas I wished to further my knowledge and understanding of the nature of things and events including human beings, with which we are inevitably surrounded. I early became highly sensitive to the differences between pristine events and the constructions built for their description.

Now since my theme is my contribution to the development of interbehavioral psychology, I might say something about my choice of an academic career. It had to be science, but which branch? Actually, I might have been content to pursue studies in chemistry or biology, but a combination of circumstances opened my way toward psychology. It is

altogether needless to justify this choice, in view of the fascination and importance of the subject. Furthermore, I soon discovered that the insufficiencies in the fields of philosophy and even some aspects of science were owing in part to a lack of competence in psychology on the part of thinkers and investigators. But despite this need for specialization I have always realized that psychology, like every other discipline, must be in contact and accord with the other disciplines, since the events of all exist only in a single vast plenum.

At this point I must mention an extremely important phase of my development. Before I finished writing the dissertation for my Doctorate, I went up to the University of Minnesota to fill a temporary vacancy in the then joint philosophy-psychology department. Hence it devolved upon me to formulate my views in logic and psychology for presentation to my students. Thus from the academic years 1915-1916 and 1916-1917 dates the foundation for the future edifice of what was originally called "organismic psychology" and later changed to "interbehavioral" or "interactional psychology". The conclusion of my second academic year at the University of Minnesota found me back at the University of Chicago, and at work completing my dissertation for the Ph.D. degree. But I did not return alone. With me came my wife, Helen, whom I met at the University of Minnesota, and who joined me in an intellectual collaboration that lasted for forty years. With her collaboration I was able to enter upon a zealous activity to develop the interbehavioral viewpoint in psychology. This work was begun at the University of Chicago, where, after receiving my degree, I remained as an Instructor of Psychology for three years, during which time I published a number of papers on philosophical and psychological topics.

Significant for the origins of interbehavioral psychology are two of my early papers. Both concern the problem of personality, which I discussed in 1918 and 1919 under the titles "Conscious Behavior and the Abnormal"[1] and "Human Personality and its Pathology".[2] I point out two prominent features of these articles. The first is that each contains early and somewhat incomplete versions of the intrinsic traits of interbehavioral doctrine. There is a definite rejection of dualistic tradition. Organisms are proclaimed to be integral units that adjust or adapt themselves to the numerous objects and conditions in their environments. Expressly stated is the rejection of the traditional mind-body dogma. Furthermore, there is no sympathy displayed with the view that organisms are merely anatomical entities and thus the terms "conscious behavior" and "human personality" are accounted for. On the whole there is adumbrated, at least in an implicit way, the field construction that I regard as of cardinal importance.

Although the contrast between a naturalistic approach to psychological

[1] Conscious behavior and the abnormal, *Journal of Abnormal Psychology*, 191, 13, 158-168.
[2] Human personality and its pathology, *Journal of Philosophy, Psychology and Scientific Methods*, 1919, 16, 236-246.

events and the traditional mythical view of soul and mind is clearly evident, in both papers, I perhaps did not stress sufficiently how wide was the gulf between the biological acts of organisms, based on cellular and species evolution then called instincts, and the more complex psychological performances based on individual and cultural development. Both papers, however, show that I seized the opportunity to support the adjustment hypothesis by testing it in the case of maladjustments and abnormal personalities.

In addition to the two papers mentioned, I published another article discussing the problem of intelligence and mental tests.[3] In it the stress is on the evolution of behavior on the basis of concrete situations. In the article on Mental Tests, I pointed out that the tests were in no sense measures of innate processes or powers but at best indicators of behavioral achievements during the life histories of individuals. In all my published articles there was reiterated the belief that a naturalistic psychology was possible and that the germ of a scientific discipline was already in existence.

The year 1920 stands out as a high point in my academic career and in the development of interbehavioral psychology. It was then that I moved from the University of Chicago to settle at the University of Indiana, at which institution I worked long and intensively to develop a comprehensive naturalistic psychology. One of the first projects I chose to work at was concerned with the important behavior basic to observation and knowledge. I entitled the paper "Suggestions Toward a Scientific Interpretation of Perception".[4]

Having studied the history of philosophy and its influence upon science and its axioms including psychology, of course, the importance of perceptual behavior called for basic reconstruction. To me it was evident that perceiving behavior should be treated as acts of organisms in contact with actual things similar to the organisms themselves. It was my main contention that if we honor the rule to derive our descriptions and interpretations from the observation of events we must conclude that what are called perceptual actions are discriminating responses performed by organisms in contact with stimulus objects under particular conditions.

To me it was clear that the age-old model of a mind-brain creating things out of formless, colorless, indifferent, quanta of energy was not based on events but upon a soul or mentalistic principle plus a series of abstractions borrowed from various sciences. This fact was supported by the perennial domination of psychology by such metaphysical constructions as a soul pregnant with innateness or a tabula rasa mind. Because such model-making marks psychology as a mythology and not a science we may

[3] Intelligence and mental tests, *Journal of Philosophy, Psychology and Scientific Methods*, 1920, 17, 260-268.

[4] Suggestions toward a scientific interpretation of perception, *Psychological Review*, 1920, 27, 191-216.

pause for a brief analysis of the standard psychological model of sensing and perceiving. For convenience I choose to examine the model of visual perceiving as developed by Sir Isaac Newton for color theory.[5] The model assumes that color sensing or perceiving begins with what is called under the aegis of modern physiology a "stimulus" in the form of some sort of energy, for example, light rays. These energies are presumed to strike the retina of the eye and there set up electrochemical impulses which are said to travel over various pathways to the occipital lobe of the brain, and there they initiate "experiences" or "sensations", of color or form. These sensations, plus images, are thought to make up mental molecules called percepts that are projected from the mind. What is most culpable about this fabrication aside from its mythology is that the brain is extracted from its biological matrix and made to serve animistic purposes.

Very early in my academic career I was aroused to correct the fallacies in this type of psychology, and so in 1922 I published an article, under the title "Can the Psychophysical Experiment Reconcile Introspectionists and Objectivists?".[6] In this article I analyzed a description published by a structural psychologist in the *American Journal of Psychology*[7] in which he indicated that the distances apart of the points of a compass applied to the skin correlated with mental states of mind in the form of a single point, a paddle, a dumbbell, to two separate points.

It is obvious that the mentalistic type of description not only is abstractionistic on the plea that scientific description must be abstractional, but also there is a complete retreat from contact with the pristine data which are different when different kinds of stimulus objects are encountered.

A fitting conclusion to my remarks about the origins of interbehavioral psychology is to recount the developmental stages of naturalistic psychology.

1. In the first place was the total antipathy toward animism or occultism in psychology. That discipline was to be scientifically analogous with all the other sciences in the sense of observing, experimenting, and interpreting or evaluating the activities of organisms as they interacted with objects, other organisms, and the circumstances environing both the responses and the things adjusted to.

2. A distinctive second stage consisted of the control of descriptive abstractions in order to maintain contact with organisms, their behavior, and the situations in which psychological events take place. I opposed the reduction of psychological events to states or mental processes as proposed by the structural or functional psychologists on one side, and the pseudophysiological reflexes of the historical behaviorists on the other.

[5] See Kantor, J. R., Newton's influence on the development of psychology, *Psychological Record*, 1970, 20, 83-92.

[6] *American Journal of Psychology*, 1922, 32, 481-510.

[7] Boring, E. G., The stimulus error, *American Journal of Psychology*, 1921, 32, 449-471.

3. A third stage was the development of an implicit field construction by way of stressing situations and conditions of behavior. This not only signified the avoidance of arbitrary abstractions but served to induce critical attention to the actual behavioral events to be observed.

4. A final stage of the development of interbehavioral psychology is the explicit treatment of behavior fields, including the analysis of responses, stimulation, setting factors, and media of contact.

II. Interbehavioral Psychology in Evolution

A. Foundation and Superstructure

My move to the University of Indiana proved to be a splendid one from the standpoint of the development of interbehavioral psychology. My teaching duties allowed for considerable time for my own studies, so that I was enabled to publish a number of books, articles, and book reviews.

An outstanding period in the development of interbehavioral psychology may be dated to the middle 1920's. It was then that my first volume of the *Principles of Psychology*[8] was published, in 1924 to be precise. This was followed two years later by the second volume. These two volumes consisted of a comprehensive exposition of many forms of psychological behavior, all from a naturalistic point of view. I intended the *Principles* to be a successor work to the *Principles of Psychology* as composed by Herbert Spencer which was followed by the famous work of the same name by William James. What distinguished my book from its predecessors was a decided rejection of the mind-body postulation basic to both. What these eminent authors were attempting to do was to improve psychology by stressing the biological factors of organisms as they performed their behavior. However, they did not in any way depart from the ancient dualistic traditions. Accordingly they merely improved the prevailing antiscientific parallelism and epiphenomenalism. To me it seemed that the famous work of James marked the futility of making physiological and neural processes into the foundation for and the explanation of the very complex adjustments of organisms to the things and events in their invariable environments. It became quite evident that any attempt to maintain animistic doctrines in psychology had to depend upon three things: 1) the exercise of ancient autistic speculation, 2) the neglect of the observable events in nonhuman and human behavior, and 3) the creative invention of brain and general nervous system processes.

What my *Principles of Psychology* attempted to demonstrate was that all psychological behavior from the simplest reflexes to the most complicated acts of thinking and reasoning could be described and interpreted in completely naturalistic terms, analogously to that of the other sciences. A

[8] New York, Knopf, 1924-26.

glance at the Table of Contents indicates that the more than a thousand pages includes discussion of such elaborate behavior as the psychology of perceiving, feeling, and emotional action, thinking, remembering, language, and many other topics. Instead of psychology being concerned with 1) soul, mind consciousness, or any other extraspatial entity, or 2) the organocentric operation of parts or wholes of biological organisms, my *Principles* was based on the observations of organisms in interaction with environing stimulus objects and conditions forming psychological fields.

Nine years after the appearance of my *Principles of Psychology* I became encouraged by the increasing appreciation of elementary classes in the interbehavioral approach to psychology to prepare a simpler version of the *Principles*. Accordingly in 1933 I produced a book entitled *A Survey of the Science of Psychology*,[9] suitable for the use of introductory classes and possibly general readers.

In the *Survey*, as in the *Principles*, psychological events were described as the adjustmental interbehavior of organisms beginning in the later stages of intrauterine embryological development. The point was made that only by observing the development of interbehavioral fields did psychology avoid metaphysical pronouncements about selves, spirits, and imaginary brain processes, even while describing the most complicated creative and logical behavior.

Since obviously psychological events are at the same time biological events, and psychological behavior of organisms develops in continuity with the embryological maturation of organisms, I included in the *Survey* a simplified treatise on biology. This was intended to show the actual relationship between biology and psychology. Not only did psychological behavior evolve from a biological matrix, but as the organism matures, its performances invariably include the participation of anatomical and physiological components. Biological components exert both enabling and limiting conditions upon the development and adjustments of organisms. But they are never to be regarded as the whole of psychological events or parallels to psychic processes.

Because the *Survey* inclined mainly toward the behavior of human organisms, it also included a section on anthropological data. Thus I made clear that the development of humans as compared with nonhuman organisms took place on two levels, first the biological, and then the cultural. Through the latter stage, the individual develops all the behavior traits that mark specific types of personality.

The *Survey* was fairly successful with students. Still I let it remain out of print for many years, while I kept busy with other intellectual projects. In 1975, however, the opportunity arose to rework that book, and to publish it under the name *The Science of Psychology: An Interbehavioral Survey*.[10] In that year I was able to secure the help of Professor Noel W. Smith of

[9] Bloomington, Principia Press, 1933.
[10] Chicago, Principia Press, 1975.

S.U.N.Y., Plattsburgh. While working on this project, it appeared that only a few refinements were called for, yet it seemed necessary to reconstruct the book after over 40 years of quiescence. Among the changes there were a number of excisions, for example, the *Survey* contained a bibliography covering 45 pages. Naturally, many of the items became out of date, and so instead of trying to revise that bibliography we merely added to various chapters some items of further reading and general bibliography. Furthermore, we eliminated most of the material on straight biology and anthropology but retained the main theoretical importance of the two interdisciplinary sciences in simpler form.

In the late 1950's I decided to add a keystone to my presentation of the general origin and nature of interbehavioral psychology. This volume I planned to be a definite systemization of psychology, so I gave it the title of *Interbehavioral Psychology: A Sample of Scientific System Construction.*[11] The book, I hoped, would serve to make explicit the details of the interbehavioral approach following a systematic pattern I worked out in two previous treatises to be analyzed later in this article. I review now the main contents of the volume.

In the beginning of the book, I presented my views concerning the nature of science in general. Science I presented as basically a work of orientation. The assumption was that scientific work consisted of the attempts made by various workers to become familiar with and to organize the knowledge of the things and events of particular disciplines.

Another point I made was that systemization or logical organization is absolutely essential for scientific work. The measure of degree of orientation was the breadth and depth of knowledge which the particular discipline could display as a result of observation and experimentation. The systemization of science or any other subject of interest involves a number of essential factors. They can be summarized as follows:

1. First the systemizer of science must consider the metasystem, that is the background of the system. The scientist who is expert in and who uses logic or systematics can profit greatly from knowing the matrix of his science, that is, the philosophical foundation of his special discipline.

2. Next is the building of the system proper. The particulars of any scientific system should begin with definitions, that is, descriptions of the scope and extent of the particular discipline. Another important factor consists of the postulates, that is, the assumptions that are being made. Basically, the postulates indicate the assumptions concerning the identity of the subject matter. In psychology, of course, it is the interactions of organisms with objects in their environment. Then come the assumptions concerning the techniques and operations that are performed with regard to the validity of those operations for the particular proposed investigations.

3. Finally, the systemization of a science implies the examination and

[11] Bloomington, Principia Press, 1958-9.

evaluation of the constructs that are developed on the basis of what is known about the things and events that are being studied. These constructs may be organized in a threefold series: *a*) the descriptions of the events studied and their relation to other types of events; *b*) descriptions of the investigation including the instruments and general patterns of the experiments; *c*) the laws that may legitimately be derived from the researches that have been made.

I have elaborated the plan for systemization to include the subsystems of psychology, such as data subsystems, the operational subsystems whether field study or experimentation, and then the applied class of subsystems.

4. As it is one of the cardinal tenets of interbehavioral psychology to stress the things and events with which organisms interact it is inevitably interrelated with the other sciences. Thus an important section of the book is devoted to the interdisciplinary relations of psychology with physics, chemistry, mathematics, and the various branches of biology.

B. Psychology and Logic

With the rounding out of the central core of interbehavioral psychology I moved on to apply the general viewpoint to the various extremely complex behaviors of human organisms. As I had always been interested in the logic of science, I made a diligent study of the work of logicians with expecial regard to the psychological implications of their studies. The results of my work were published in two treatises, *Psychology and Logic*[12] in two volumes, and a third entitled *The Logic of Modern Science.*[13] As a matter of course it soon became clear that logical theories were influenced by the psychological backgrounds of logicians. The logic of Aristotle and the Greco-Romans, developed under biopsychological views, was based on rhetoric and argumentation. But aside from this period students of logic operated under the influence of mentalistic psychology. The entire mass of problems they raised about certainty and reality were predicated on the notion of mind and its relation to truth and necessity. Some logicians excluded psychological considerations from logic as they argued for external independent verities, while others argued that since psychology was the basis of thought and knowledge, it was indispensable to logic.

From a naturalistic point of view logical works and their products certainly do have psychological implications since logical systems are the products of persons interested in that subject matter. My basic conclusion was that logic is a process of system construction. The structural material could be of any sort the organization of any sort of objects, or the most abstract relations of mathematics. An outstanding characteristic of interbehavioral logic is its specificity. By contrast with the general tradition

[12] Chicago, Principia Press, 1945-50.
[13] Chicago, Principia Press, 1953.

of logic to stress particular systems as universal and absolute, interbehavioral logic emphasizes the processes of system making and makes room for an innumerable census of systems.

As was to be expected, the many aspects of logic required the analysis of a large number of problems. My selection of topics within the subject of logic required two volumes. Volume I is devoted to general issues, for example the cultural and historical development of the subject, the relation of psychology and logic, the place of language and symbols in logic, as well as the nature of thinking and reasoning, including their relevance to logic.

The target of Volume II is the constructional process and the system products. One important emphasis was upon the linguistic instruments used for intellectual system building. Such instruments are especially useful for the construction of abstract systems. Other matters of importance are 1) the nature of universals and the psychology of belief in their existence, as well as the general nature of such entities; 2) the causal principle in logic or systematics; 3) the laws of thought and things; 4) probability and 5) measurement.

As scientific occupations comprise some of the most important activities of persons, the systematics of science becomes an effective criterion of the value of the work performed. Thus the naturalistic aspect of interbehavioral psychology is stressed in the book *The Logic of Modern Science.*

Fundamentally, this book was designed to separate the work and the products of scientists from all historical pseudophilosophical epistemologies and ontologies that have infected the thinking of scientists from early days to the present. As literature of science indicates, scientists have been adversely influenced by the type of psychology that they have absorbed from cultural institutions. The interpretation and descriptions of scientific work and the products thereof have been sadly subverted by principles of "mind", "reason", "sensation" and "experience". In other words, scientific writers have not been free from transcendental metaphysics which has competed with their descriptions and operations based on actual contact with objects and events.

In this book I have argued that an objective psychology is a prime intellectual equipment of scientists. I attempted to demonstrate the urgent need to differentiate between constructs in the form of hypotheses, descriptions, and theories, and the events concerning which these constructs are developed. I illustrated my point by differentiating between constructs and events in the sciences of physics, chemistry, biology, and of course, psychology. Success in science, I proposed, depends upon the harmony between axioms or postulates and the investigation. The axioms or postulates must of course be derived from contacts with similar objects and situations instead of being imposed upon the events in the descriptions and interpretations. My work on psychology and logic strongly supported the interbehavioral position.

C. Special Studies in Interbehavioral Framework

Granting the merits of interbehavioral fields as valid framework in psychology, it seemed to me desirable to analyze special problems of psychological behavior from that standpoint. This interest I have followed through with respect to social psychology, physiological psychology, and the psychology of language and grammar.

1. Social Psychology. After completing my two volumes of the *Principles of Psychology* I turned to the study of social psychology, a subject which seemed to be in a rather chaotic condition. Because the subject was born under the auspices of Herbartian "group mind" theory it was sadly intermixed with sociology. In fact the early English language books by that name were composed by sociologists and not psychologists. The basis for this confusion was, of course, that most of psychological behavior is developed under group conditions though the group may consist of only several persons.

Consequently the primary emphasis of my book entitled *Outline of Social Psychology*[14] was that for psychology the data investigated consisted of the behavior of individuals under cultural auspices. Social psychology was really cultural psychology. By definition cultural behavior was shared behavior though the number of persons involved might be very small, even to one other individual, or very large as in the case of the personnel of a club, nation, or international community.

In line with the axioms of interbehavioral psychology the search for the characteristics of social behavior, which actually comprises most of human activities, must be sought in group behavior fields such as first the family and later the school, workplace, and general societal circumstances.

As to stimulus objects and functions, they are localized in prevailing institutional persons, parents, rulers, officers, priests, and so on. Institutional objects with which individuals interact consist of schools, language, laws, traditions, rites of all sorts, and so on.

2. Language and Grammar. Consonant with my greater interest in human rather than nonhuman behavior I naturally have always been deeply interested in speech and other form of intercommunication. My doctoral dissertation of 1917 consisted of a general study of the terminology employed by philosophers in their ontological and epistemological speculations.[15] I criticized the traditional belief that the words called categories were independently existing realities rather than constructions with complexions dependent upon particular times, places, and prevailing circumstances. In this connection I published a number of papers beginning

[14] Chicago, Follett, 1929.

[15] Functional Nature of the Philosophical Categories, unpublished.

in 1922 to localize the study of language within the interbehavioral framework.[16]

These efforts culminated in a volume published in 1936 entitled *An Objective Psychology of Grammar.*[17] In this work I attempted first to distinguish psychological language from the language things studied by general linguists. Then I endeavored to present linguistic behavior within the framework of naturalistic psychology as it touched upon the grammatical aspects of speech.

My Grammar book then contrasted with the conventional studies of language. The latter was founded with words as the primary data of language. Basically words were presumed to be derived from texts. The earliest texts were of course those pertaining to sacred documents. But even linguists who studied modern language systems built up a structuralistic tradition in which elements called phonemes were regarded as the bricks composing morphemes, phrases, sentences, and ultimately verbal systems. Although linguists have claimed that they derive words from actions, they really do not do so but indulge in structuralistic verbal edifice construction.

Verbalists compose two classes. One overshadowed by dualistic institutions assumes that words must be associated with mentalistic entities called meanings. The other group does not, at least, overtly connect words with meanings relying mainly on the principle of word usage. Moreover, they may prefer to believe that such usages develop on such abstractive principles as rewards and punishments.

In opposition to conventional linguists of both types I advocated dealing with grammar problems on the basis of actual linguistic behavior of persons. On that basis I argued that all grammars consist entirely of styles of communicative adjustments. Furthermore the styles were selective and abstractive, grammars and language descriptions were usually built on the basis of "standard" speech, that is, the presumably proper speech of the elite speakers of cultivated societies or the educated actors on the stage.

By contrast with the word study of the general linguist the aim of the *Objective Psychology of Grammar* was to describe the actual speech behavior of persons. Notwithstanding the few attempts by linguists to portray the dialectal speech of rural dwellers or persons of humble urban levels there is a meager representation of speech as concrete adjustments. In the literature of linguistics it is of course impossible to take account of anything but verbal utterances. Gestural aspects of individual dialects or community styles can only be imagined. In addition there are innumerable variations such as omissions, and additions of peculiar sounds in the speech of persons.

[16] An analysis of language data, *Psychological Review,* 1922, 29, 267-309. Can psychology contribute to linguistics? Monist, 1928, 38, 630-648. Language as behavior and as symbolism, *Journal of Philosophy,* 1929, 26, 150-159. The role of language in logic and science, *Journal of Philosophy,* 1938, 35, 449-463.

[17] Indiana University Publications, *Science Series,* 1936; republished by Principia Press, Chicago, 1952.

3. Physiological Psychology. Because psychological behavior is at the same time also subject to the laws of physics, biology, and anthropology, it devolves upon psychologists to fit their data and principles into a general scientific framework. This happens to be a crucial problem in the history of psychology, and psychologists have long been preocupied with the relationship of the organic and psychological factors in behavior. Since post-Greek times organisms have been dichotomized into spirit and matter, or soul and body. Most of psychology today remains within the mind-body framework and psychologists have followed the fruitless trail of psychophysical parallelism, interactionism, or identity, whether knowingly or not.

With the utter and final rejection of the putative psycho-bodily relationship the problem of physiological psychology, according to interbehavioral psychology, implies the potentiality of organic factors in the facilitation and inhibition of psychological performances. The key formula is of course that the organic structures and functions participate in the actions or behavior of organisms. Rejected is the notion that physiological processes are the bases or determiners of psychological behavior as pseudocauses. In my book entitled *Problems of Physiological Psychology*[18] I have, then, explored a number of specialized problems under such rubrics as The Brain in the History of Science, The Biology and Psychology of the Nervous System, Sensory Physiopsychology, Experimental Psychoneurology, Clinical Psychosurgery, Psychochemistry, and Psychosomatic Medicine.

D. Interbehavioral Psychology in Historical Perspective

The popular adage that ignorance of history is to repeat the errors of the past has special significance for the science of psychology. It is more the case for psychology than for other disciplines that the interpretation of data is influenced by the general culture prevailing at certain times and places. The career of psychology plainly shows that even the process of quantization and experimentation have been geared to animistic presuppositions. It is inescapable that a serious study of the career of psychology might have avoided this. For that reason we may conclude that the history of science is an effective tool for carrying on scientific work.

After the publication of my *Interbehavioral Psychology* book I proposed to correct the lack of a factual treatment of the career of psychology as a scientific discipline, and undertook to trace the evolution of psychology as a science. In 1963 I was able to publish the first volume of my *The Scientific Evolution of Psychology* and in 1969, the second volume.[19] I pursued all my historical studies with the conviction that the evolution of scientific psychology should be treated with complete freedom from the thralldom of transcendental assumptions, and I have found no basis for

[18] Bloomington, Principia Press, 1947.
[19] Chicago, Principia Press, 1963-1969.

altering this opinion. In this respect my book on the evolution of scientific psychology is the first and still the only attempt to narrate the history of psychology from a naturalistic and objective point of view. Interbehavioral psychology I ascribed to the last of four periods in which I divided the career of psychology as a science.

Period I. In the two volumes just mentioned I stressed the striking fact that the first period of the history of psychology was entirely naturalistic. In this period, which dates back to the fourth century B.C. in Greece, Aristotle created a fairly comprehensive system of psychology which has come down to us through the medium of two works, known as *De Anima* and *Parva Naturalia*. In a clear, though simple way, Aristotle treats psychological behavior as acts of organisms in contact with things through the mediation of particular conditions. Some acts are focused on specific organic structures, while others are more general and based on the total organism. What is especially to be noticed is that the earliest Greek and Roman science is wholly free from the mythology of the uneducated populations, so there is no vestige of animism or occultism in the earliest period of scientific psychology.

Period. II. Unfortunately for the history of psychology the naturalistic viewpoint of Hellenic culture did not long survive the political and economic misfortunes of Greek and Roman civilization. From a scientific standpoint it is deeply impressive how the subject matter of psychology changed from interactions with things and events to autistic pronouncements. Outstanding early thinkers like Tertullian glorified ignorance and illogicality, so that transcendental spiritualism became rife and still dominates the thinking of technical psychologists. The depths to which psychology descended can be estimated by the perusal of the works of Plotinus in the third century A.D., St. Augustine in the fifth, and S. Thomas in the thirteenth century. What is most striking about the history of psychology is that the mysticism and occultism of this period has influenced the entire line of psychological thinking, including that of the idealistic experimenters like Helmholtz, Wundt, and their scientific successors. It was in this period that such concepts as feelings, will, sensations, images, were developed as psychic parallels to bodily action.

Period III. The primary characteristics of the third period I suggested were the changes in technical psychology which showed that writers on psychological subjects attempted to profit by the evolution of the so-called exact sciences since the twelfth and thirteenth centuries. Although transcendental views still held sway throughout all the later centuries, writers on psychological subjects modified the soul tradition to become self, mind, and later conscious processes. From at least the seventeenth century the belief of the importance of the body along with the psyche was made increasingly prominent until the Darwinians and other evolutionists began to feature organisms and their activities as basic factors in psychological performances. So far did the imitating process develop that psychologists

made use of statistics, mensuration, and general quantization up to the point of designing and performing experiments.

Period IV. The date of this period may be counted as primarily in the twentieth century, a time when the intellectual world has become so complex as to allow for many sorts of strange and contrasting events and situations. So far as scientific psychology is concerned, this is a period of revolution. It is a period in which the dominant mentalism was forced to face a formidable competitor called behaviorism. Essentially behaviorism is antimentalism, and as such it carries within itself the potentialities for the evolution of a scientific psychology. Behaviorism for the second time in history allows for the study of psychological events as they actually occur without embellishing the interactions of organisms with other organisms and other things and conditions with fairy tales invented by the Church Fathers of old.

In my *Scientific Evolution of Psychology* I make plain that there are two distinctive versions of behaviorism, each with its own initiatory formulation and comprehensiveness. The version which I prefer to designate as interbehaviorism was originated on the premise that psychology should be exclusively based upon naturalistic foundations, along with every other science, and that its studies should comprehend every type of psychological field, even the most complex. Its primary effort was to be devoted to the study and analysis of psychological events and not to deform and deface them on any type of procrustean specificities.

The second version of antimentalistic psychology, and the one most generally referred to as just behaviorism originated from studies of nonhuman organisms together with some reinforcement from the conditioning processes made famous by the work of Pavlov, Bechterev, and their followers. In retrospect, ordinary behaviorism was confined to the study of such modifications of behavior as could be categorized as learning, with the result that an incongruous schism became established in psychology between cognitivists and learnologists.

III. Apologia

As a fitting conclusion to this paper I would like to summarize briefly some of the advantages that I believe may be claimed for the interbehavioral viewpoint in psychology.

1. Interbehavioral psychology clearly shows the way to demythologize the study of psychological behavior, and thus aid psychology to become a natural science. It may be claimed for this viewpoint that it is the only way to avoid animistic beliefs and the occultism of traditional philosophy, but also the only way to effectively approach all the variety of particular psychological events.

2. The field hypothesis as the central distinction on interbehavioral psychology offers the most accurate and analytic interpretation of

psychological events. It avoids the errors of organocentrism and the false causative process of stimulus determination. In general it throws into relief the true nature of stimulations and responses along with the influence of the media and the setting factors of psychological performances.

3. Psychology and Biology. I count it a considerable merit of interbehavioral psychology to clarify the relationship between the psychological and biological phases of behavior adjustments. It is no mean achievement to appreciate that the psychological performance is the larger event, and that the biological factors participate in an essential and definite way in the larger adjustment. Once this relationship is understood much light in thrown on two important problems: one, the place of the brain and the nervous system in psychological behavior, and second, the problem of inheritence in psychology.

4. Inheritence in Psychology. Many biologists and psychologists are troubled by the problem of inheritence of behavior. Since the concept of inheritence is a borrowing from the legal and economic domains, it definitely is used in psychology on the analogy of transmitting property from persons to other persons. Biologists may be allowed the analogy of transmission on the basis of the continuity and exclusivity of the characteristics of species. But psychologists who are concerned only with behavior fields can have no place for any transmission process.[20] Even the biologist who stresses organisms must take the environing conditions into strict account. Interbehavioral psychology makes definite that psychological behavior is in no sense the exclusive performance of organisms with little regard to the rest of the field factors.

5. The Brain and Nervous System. With the growing historical disaffection for soul-self mysticism, psychologists have hit upon the device of making the brain the seat and substitute for the mind. It became fashionable to call the brain the organ of consciousness and of mind. But obviously no unadorned events justified any such perversion of biology and of the behavior of organism. The brain is a integral organ of the organism with the biological functions of conducting impulses from one part of the organism to the other, including a number of decussations serving the organization of behavior so that the organism operates as a single unit. As early as 1922 an 1923[21] I protested against imposing mental functions upon the nervous system along side its actual biological functions.

6. A notable virtue of interbehavioral psychology is its capacity to treat the necessary details of psychological events and also its catholicity in comprehending every type of psychological behavior. Even when

[20] For an observational and naturalistic psychology all behavior arises as a component of a field by a process of successive field modification which begins originally from a zero point. A good example is the development of oral *communication* from *random* vocalization.

[21] The nervous system: psychological fact or fiction, *Journal of Philosophy*, 1922, 19, 38-49, and The organismic versus the mentalistic attitude toward the nervous system, *Psychological Bulletin*, 1923, 20, 684-692.

psychologists do not involve themselves with dualistic presuppositions as when they study conditioning, they do not analyze thoroughly the components of adjustmental fields. For example behavioristic psychologists who concern themselves with the modification of behavior still do not explore the indefinitely many ways of analyzing the processes of building up and transferring functions from one object to another.

An equally important correction proposed by interbehavioral psychology is the avoidance of the schism of cognitive versus learning divisions of psychology. Since there are no vestiges of mentalism in the system all the activities like perceiving, thinking, feeling, and so on are on a par with reflexes, behavioral acquisition, and learning.

Finally, it is a wise maxim that in order to practice effectively it is essential to be well-prepared with verifiable theory concerning the nature and occurrence of psychological performances. Thus, because interbehavioral theory is derived from observations of all types of behavior, it may be regarded as basic to psychological practice of every sort.