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CYBERNETIC PHENOMENOLOGY

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INTRODUCTION

What follows is a description of a program for a Unified Theory of Conduct. It may be of interest to those concerned with conceptual, methodological and explanatory problems in theory construction in psychology and in the social sciences, and in particular to those whose concern it is to emphasize value relevance, humane empathy, sympathy for growth, enjoyment of complexity, variety and adventure in human experience, and who reject simplistic, ritualistic, static and mechanical conceptions of human individual and social existence.

While in many of its parts the Unified Theory is still only a general format, many other parts are developed in considerable detail. My purpose today is **not** to report on the progress of a project about which most of you are hearing for the first time, but to describe a theoretical and methodological approach to the total domain of behavior studies.

To construct a Unified Theory of Conduct, I am using a method, which I call Phenomenological Systems Analysis. Phenomenology is used as a method of conceptualization, while systems analysis (not in the sense used by the "social systems analysts" or the "general systems analysts", but in the sense used by computer scientists and engineers), is used as a method of explanation.

The Unified Theory of Conduct consists of three General Theories. Each is concerned with a different fundamental problem, employs a different method for its solution, has its own special concepts and invokes different systems of explanation. The three General Theories are, however, unified by a Common Conceptual Space, by a Theory of Structuring of Action, and a Theory of Aggregation of Action.

One fundamental problem (currently the primary concern of psychologists, micro-economists, and theoreticians of automata) is the **conduct of individuals**, be they organisms or machines. I call the method employed for its solution **Cybernetic Phenomenology**. The explanatory system invoked is the logic of functional analysis (in the sense used in modem physics) and its elaborations in the calculus of variations and the various models of cybernetics. The proposed solution is called the General Theory of Action.

Another fundamental problem is the conduct of groups of organisms and machines. Groups are aggregate systems with all individuals and relations of interest identified. The subject is currently dealt with primarily in social psychology and the theories of the firm, of corporations and of games. The method employed is Structural Phenomenology. The explanatory system invoked is primarily derived from set theory and its various elaborations and applications, such as graph theory,

lattice theory, and matrix algebra. The proposed solution is called the General Theory of Interaction.

A third fundamental problem is the conduct of collectives. Collectives are aggregate systems where all individuals and/or interactions cannot be meaningfully identified, either because of the number of elements and relations, or because of the heterogeneity that is of interest. The method employed for its solution is called Stochastic Phenomenology. The explanatory system invoked is probability theory. Since this is a domain of inquiry largely abandoned by the present generation of sociologists, the models available are to be found primarily in macroeconomics, population genetics and epidemiology. The proposed solution is called the General Theory of Transaction.

Since, as you may agree, time does not permit a full description of Phenomenological Systems Analysis and of the Unified Theory of Conduct, I shall merely outline the salient characteristics of Cybernetic Phenomenology — as called for in the title listed in the program — and of the General Theory of Action. Time permitting, we may consider briefly the structure of one of its sub-theories, the Special Theory of Orientation.

THE GENERAL THEORY OF ACTION

The General Theory of Action attempts to explain systems of actions while holding an individual actor constant as a point of reference, and allowing situations to vary.

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The above formulation is, of course, a highly technical abstraction, the root of which is a naive curiosity about the activity of individuals, *i.e.,* organisms —human or not — and machines.

The identical element — an organism or a machine — may be equally appropriately analyzed either se a **physiological system** trough the application of concepts and principles of physics, chemistry and biology, or as a **psychological system** through the application of concepts and principles of the social sciences. Its complement, *i.e.,* its environment, may be similarly analyzed, either as an **ecological system**, or as a **system of situations**. From the point of view presented here, the fundamental difference between the two modes of analysis is whether the phenomena under study are conceived of as **systems of energy**, or as **systems of meaning**. This is not an ontological, but an epistemological decision.

Since my primary interest is in the meaning of conduct and not in the thermodynamics of behavior, I am led by the above distinction (as well as by other reasons) to a commitment to phenomenology as tic method of conceptualization. The terms actor, action, and situation will, therefore, indicate that individuals, their environments, and their activity in these environments have been conceptualized phenomenologically.

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The same fundamental abstractions (actor, action, and situation) imply a commitment to a particular mode of explanation with a long, illustrious and troubled tradition in philosophy, psychology and social science. It is a mode of explanation, which is focused on the appearance of regulation (or the lack of regulation) of conduct. Within this tradition, actions are simply those exchanges between individuals and their environments that are actually or hypothetically regulated. Actors (or situations) are those aspects of individuals (or environments) that are analyzed as sources of regulation or disturbance.

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Actors, situations, and actions are terms for individuals, environments, and exchanges between them that have been conceptualized as systems of meanings (*i.e.,* phenomenologically), and explained as systems of regulation (*i.e.,* cybernetically). This conception of action is compatible with Parsons' classical definitions, which summarize the humanistic tradition of analysis:

- Action is (1) "***the relation between actor and situation***" and (2) "***the distribution of energy ... subject to specific constraints***".

The attempt to construct a General Theory **of Action** draws on the classical tradition of action analysis wherever possible. However, having made explicit the basic intent of conceptualization, *i.e.,* the abstraction of the meaning of conduct, it accepts phenomenology as the only method of conceptualization appropriate in the construction of the theory. In the same way, it adheres to the idea of constraints as the sole source of explanation, and refuses to introduce any additional, incompatible, and empirically untenable explanatory ideas, such as intentionality and goals — implied in Parsons' original definition of action, *i.e., "Actor seeks goals in situations".*

Thus, the analysis radicalizes conceptualization of action by accepting phenomenology as its sole method. At the same time, it rejects pre-scientific, introspective and romantic functionalism with its teleological fallacy as a method of explanation of action. Instead, it simply substitutes what is called functional analysis in physics. This is a step from the logical structure of Hero's explanation of the behavior of light rays as prescient and purposive, to the logical structure of modern quantum, electromagnetic, relativity and game theories, to name a few.

FUNCTIONAL EXPLANATION

The structure of functional explanation is extremely simple.

Given a set of boundary conditions (values of a set of independent variables), the behavior of a functional system (a system of intervening variables) is so constrained that the value of an essential (dependent) variable is extremum. Extremum is a general term for either maximum or minimum values in a range, or for constants.

While the concept “extremum” permits, on the one band, further formal elaboration, it imposes, on the other ~hand, a rigorous methodological restriction. The recipe for a meaningful functional analysis of empirical data follows. First, discover an essential variable, the value of which in fact remains constant or at a maximum or a minimum or possible value. Next, identify the necessary and sufficient set of variables that maintain the essential variable at extremum. Third, discover through naturalistic observation, or by violating them through laboratory experimentation, the necessary and sufficient set of boundary conditions under which the phenomenon occurs, and without which it disappears.

Functional analysis is the foundation stone of cybernetics — the rest is a combination of functional chains through loops, and the analysis of interaction between various sources of disturbance (variance).

THE FUNDAMENTAL PROBLEM AND ITS SOLUTION

The General Theory of Action conceptualizes activity of individuals in environments phenomenologically as **actions constrained by systems of meanings**. It constructs actors and situations as the sources of meanings. It explains action cybernetically as the **mutual disturbance and regulation by an actor and a situation**.

Thus conceived, the fundamental problem of the General Theory of Action becomes: How do an actor and a situation regulate action?

To solve the problem, the theory provides in essence (1) A conceptualization of boundary conditions that act as sources of disturbance; (2) A specification of systems of intervening variables, by formulating various processes into which ongoing action can be meaningfully analyzed; and *(3)* A set of essential variables and their propensities to assume extremum values that regulate — which also means that explain — the various processes.

THE THREE SPECIAL THEORIES OF ACTION

The General Theory of Action postulates that separate conceptualization and analysis of three special processes is necessary and sufficient for a complete analysis of action. Each of the three processes expresses a different fundamental propensity of action. While embedded in the common conceptual and explanatory format of the General Theory, the analysis of each process requires also special concepts, mechanisms, and principles. Thus, the three Special Theories of Action accomplish the actual analysis of action. The General Theory provides the concepts, mechanisms, and principles necessary for the description and explanation of the interplay of three special processes. It, thus, becomes the theory of integration or disintegration of action.

The three Special Theories are: (1) The Special Theory of **Orientation**; (2) The Special Theory of **Motivation**; and (3) The Special Theory of **Decision**.

Each theory employs quite different explanatory structures. The Theory of orientation employs a format derived from information theory, the Theory Of

Motivation a format derived from the theory of elasticity, and the Theory of Decision a format derived from the economic theory of decisions under risk.

Each theory postulates a different principle regulating (*i.e.,* explaining) the relevant process. The **form** of the principle is the same in all three Special theories, and also in the General Theory. Its **content** differs with each theory.

Each explanatory principle consists of (1) the specification of the kind of extremum that is maintained (form) and (2) the identification of the essential variable of each process (content).

The form of the principles derives from the logic of functional explanation described above: The value of an essential variable is maintained at an extremum by a system of intervening variables only under a given set of boundary conditions.

The extremum maintained in each case is of the form — **reduction of the maximum possible amount of *e*** — ***e*** being the value of the relevant essential variable ***E***.

The essential variables of the three processes of orientation, motivation and decision express the fundamental propensities of action, *i.e.,* to **manage**, respectively, **uncertainty, tension, and risk**. The special principles of action are: for the process of orientation, the reduction of the maximum possible amount of uncertainty; for the process of motivation, the reduction of the maximum possible amount of tension; and for the process of decision, the reduction of the maximum possible amount of risk.

THE GENERAL THEORY AS A THEORY OF INTEGRATION AND DISINTEGRATION OF ACTION

The General Theory of Action is composed of three Special Theories of Action. Each describes an analytically distinguishable process of action, expresses a different fundamental propensity of action, and postulates a special principle regulating action.

It is *a* fundamental postulate of the General Theory that all three processes are not only sufficient, but also necessary to regulate *(i.e.,* to explain) action. This represents a radical departure from prevalent monistic thinking, and without bearing this constantly in mind, one will not understand the theory.

Furthermore, the processes are postulated to be empirically independent within systemic ileitis — thus, the processes are as likely to be mutually antagonistic as they are to be mutually irrelevant or solidary.

Life does not exist, nor does it cease, due to the realization, or lack of realization, of its propensities, Rather it exists where the system is able, and ceases when it is not able, to cope with disturbances that push the processes of action beyond systemic limits. “The vital balance,” as Meninger has called it, is an important characteristic of life and one of the topics of the General Theory of Action. Yet it is a **vital *im*balance** that temporarily gives rise to a phenomenon called life.

THE GENERAL PRINCIPLE OF ACTION

Having delegated most of the task of explaining regulation of action to the three Special Theories, the problem *par excellence* for the General Theory of Action becomes: What process and principle governs the interplay of the three special processes? Or, stated differently, under what conditions does action, *i.e.,* activity constrained by meaning, occur — and under what conditions chaotic behavior?

The salient features of the proposed solution are: The interplay of the three special processes is seen as a general process, which manifests a propensity toward **authenticity**. Stated in the format explained earlier, the General Theory explains action as governed by a **general principle of the maximum possible reduction of *in*authenticity.**

The term authenticity is likely to be correctly understood in its dictionary meaning and its use in existential philosophy. The principle governs the interplay of the three processes by generating experiences such *as* guilt, shame, and anxiety when inauthenticity is increased, and by either reducing these experiences or generating their opposites, if it is decreased. Formally speaking, experiences such as guilt are generated when special processes of action (or their sub-processes) act mutually antagonistically. When the general principle operates properly, systemic limits are actually experienced.

Another way of stating the general principle of action is as a categorical imperative: Above all, action must **reduce** as much as possible any **discrepancy between the *state of the organism* and its *definition as an actor***. Clearly, there are two ways of reducing such discrepancy. One may change one's state as an organism to correspond to correspond to one's definition as an actor, or one may change one's definition to correspond to one's state. The difference between the two ways is partly illustrated by the distinction between some mechanisms of adjustment, such as learning, and mechanisms of defense.

THE SPECIAL THEORY OF ORIENTATION

Among the results of the process of orientation is precisely the continuing generation, evaluation, and acceptance or rejection of the two constructs — one's state as an organism and one's definition as an actor.

I have covered this topic in some detail elsewhere. Those interested may wish to read my chapter "Systems of Orientation" in Manfred Kochen (Ed.), *Some Problems in Information Science,* New York and London: The Scarecrow Press, Inc., 1965, pp, *67-93.*