

# Thinking about Experience and Action

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*Kybernetes. The International Journal of Systems & Cybernetics.*  
Vol. 35, No.3/4, 2006. Pp. 347-359.<sup>2</sup>  
ISSN 0368-492X.

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<sup>2</sup> Manuscript accepted 1.5.2004.

# Thinking about experience and action

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## ABSTRACT

**Purpose** - To develop a conception of experience and action.

**Design/methodology/approach** - Phenomenological concepts of subjectivity and meaning are combined with cybernetic concepts of constraint.

**Findings** - A unified theory of action and experience is developed.

Originality/value - The theory provides a scientific, cybernetic, unifying theory of experience and action applicable to individuals, groups and aggregates.

**Key words** - Experience, Action research, Cybernetics, Constraint handling.

**Paper type** - Conceptual.

## A PERSONAL INTRODUCTION

Much of Felix Geyer's intellectual and organizational efforts over many years have been devoted toward establishing Sociocybernetics as a coherent academic discipline, with a well defined problem area, history, collegium, meetings, publication and ties to other scientific, scholarly and academic institution. In this he has been to an extraordinary extent successful. I for one have benefited from his accomplishments and extend him here my thanks.

Most of the profound literature concerning the problem of the unity and diversity of knowledge is, from ancient Indian and Greek philosophy on, preoccupied with ontology. To become even superficially familiar with it is to be awed by the complexity of the various issues. This essay is, however, merely concerned with the questions of the epistemology and methodology of human studies that have been explicitly and systematically discussed primarily in Germany at the turn on the 19<sup>th</sup> and 20<sup>th</sup> Centuries. These debates are now remembered as *der Methodenstreit*. Even though I shall also refer or allude to issues and concepts made famous in the context of ontology by earlier as well as later writers<sup>1</sup>, I do not here

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3 Original page number in: Kybernetes, Vol. 35, No.3/4, 2006. Pp. 347-359.

advance any claims or make any assertions about how things really are, but only meditate about how they could be thought about and studied.

Like Felix Geyer and a few other sociologists and psychologists of our generation who were influenced by the then new ideas of general systems theory and cybernetics, I spent years thinking about how to conceive of experience and action from these perspectives.<sup>2</sup> I feel that I should not pass up the privilege to review my own approach in a Festschrift dedicated to Professor Geyer. I shall sketch the main points or nodes of the development of my effort, drawing on and referring to material I have previously published and also to material on my web site.<sup>3</sup>

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## EXPERIENCE AND ACTION

### THE PHENOMENOLOGY OF EXPERIENCE

My first attempt to develop a conception of experience and action I have presented at various occasions<sup>4</sup> and then published in the context of a program for the development of the third generation of computers by IBM, in what could be now called a design of an AI system as “Systems of Orientation”<sup>5</sup>. Later I reverted to using an earlier name — special theory of orientation — and generalized the approach to other special theories<sup>6</sup> and a general theory of action. Over the years I have been expanding and slightly revising the original formulation.

### ECHOES OF DESCARTES AND SPINOZA

Things are concrete entities of our perception. Labeled, they enter into our representations in choro- and chronography. Systems are formal entities of the mind and culture. Systems are n-ary relations (sets of relations on a set of variables). Although all the information about a system is specified by an n-ary relation, one may focus attention on the more explicit representations of a system, such as its field, space, state, process, structure, or development.<sup>7</sup> In natural language and thought, as well as in scholarship and science, we postulate connections between systems and thing by implicitly or explicitly employing correspondence rules between terms and transfer procedures between assertions.<sup>8</sup> Mediating roles play abstract, conceptual schemes.

Things (interpreted as patterns of data or *capta*) can be treated as corresponding to systems. They can be embedded within a space, endowed with boundaries, having a center (a focal point or a focal region) defined by some method of denotation and a trajectory describing the locus of changes of this center. Their development can be represented as changes of their boundaries and/or as a transformation of the structure of the system.

A thing embedded in a physical space-time is analyzed as a *res movens*. Its boundaries as an object are determined by its extension. A center of objectivity is denoted. The locus of translations of the center of objectivity is a trajectory called

the world line of the object. The development of the object involving its rotations and the deformations of its boundaries is represented as a swath of form within indefiniteness. Objects can be conceptualized employing the metaphor<sup>9</sup> ‘organism’, or the metaphor ‘machine’. If conceptualized as ‘organisms’, their activity is interpreted as behavior, if as ‘machines’ then it is interpreted as performance. This essay is not concerned with objects.

A thing embedded in a semantic space-time is analyzed as a *res agens*. Its boundaries as a subject are determined by its intension. A center of subjectivity is denoted. The locus of translations of the center of subjectivity is a trajectory called the life history of the subject. The development of the subject involving the vibrations, rotations and deformations of its boundaries is represented as a swath of meaning within indefiniteness. Subjects can be conceptualized employing either the metaphor ‘template’ or the metaphor ‘mind’. Under both of these metaphors, the center of subjectivity is conceptualized as an *eidolon* (a phantom, a ghost, an apparition).

Under the metaphor ‘template’ subjects are conceptualized as systems of conventions. Their center of  349 subjectivity is conceived as being a *xenos* (a stranger, a visitor, an other). The activity of the system is seen as its conduct.<sup>10</sup> Under the metaphor ‘mind’ subjects are conceptualized as systems of intentions. Their center of subjectivity is conceived as being an *Idios* (an I, a self). The activity of the system is seen as its action. Most of psychology, economics and sociology has been and is a discussion or study of the conduct or action of subjects.

This essay I shall limit to the interpretations of the centers of subjectivity as the experience of the selves and the experience of their environment as their worlds (including their others). The relations between the selves (phenomenologically noetic poles of experience) and their worlds (phenomenologically noematic poles of experience) are interpreted as actions in semantic space.

## THE UNIFIED THEORY OF ACTION

To construct a unified theory of action 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 senses used by the “social systems analysts” and 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 action 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 *action of individuals*. 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 modern physics) and its elaborations in the calculus of variations and the various models of cybernetics. The proposed solution is the general theory of action.

Another fundamental problem is the action of groups. 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 I call 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 the general theory of interaction.

A third fundamental problem is the action 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 I call 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 the general theory of transaction.

## 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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### Phenomenology

The identical element — an organism or a machine — may be equally appropriately analyzed either<sup>11</sup> as a *physiological system* through 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 interest here is in the meaning of action 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 the 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.

For an impression of how I now conceptualize the key elements<sup>12</sup> and thus the semantic space, see Tabela I - VI<sup>13</sup>.

Table I. Epistemic systems of discourse: Simple systems.

SYSTEM NAME		VARIABLES	THEIR VALUES TERMS	RELATIONS RULES OF INTELLIGIBILITY
1	Accounting	Macro-Operator Observer / Participator	Event Captum / Datum	Pattern (N-tuple)
2	Conceptual	Variable	Class	Proposition (Relationship)
3	Symbolic	Order symbol (Locus)	Place symbol (Situs)	Formula (Function)

Table II. Epistemic systems of discourse: Combination operations.

SYSTEM X&Y	COMBINED SYSTEM NAME	CORRESPONDENCE RULE		TRANSFER PROCEDURE	
		$V_x \leftarrow V_y$	$V_x \rightarrow V_y$	$\mathfrak{R}_x \leftarrow \mathfrak{R}_y$	$\mathfrak{R}_x \Rightarrow \mathfrak{R}_y$
2 & 1	Methodological	Interpretation as indicator	Operational definition	Inductive generalization	Experiment
2 & 3	Theoretical	Semantic interpretation	Lexical definition	Deductive inference	Explanation
1 & 3	Representational	Representation	Symbolization	Production	Simulation

Table III. Epistemic systems of discourse: Combined systems.

SYSTEM NAME		VARIABLES	THEIR VALUES TERMS	RELATIONS RULES OF INTELLIGIBILITY
2 & 1	Methodological	Index	Fact	Hypothesis
2 & 3	Theoretical	Scale	Construct	Law
1 & 3	Representational	Instrument	Artifact	Model

Table IV. Telic systems of discourse: Simple systems.

SYSTEM NAME	SUBJECTIFYING OPERATION	CRITICAL VALUES  HERMS	FOCAL REGION <i>Definition of subject (Self)</i>		FUNCTIONAL RELATIONS  RULES OF WARRANTABILITY	
			INTERNAL <i>Anima</i>	EXTERNAL <i>Persona</i>		
1	Aesthetic	Separation	Threshold	Existence	Consumer	Arousal (Emotion)
2	Moral	Commitment	Standard	Identity	Role	Rule of action
3	Axiological	Individuation	Value	Essence	Sva-dharma	Rule of importance

Table V. Telic systems of discourse: Combination operations.

SYSTEM X&Y	COMBINED SYSTEM NAME	CORRESPONDENCE RULE		TRANSFER PROCEDURE	
		$V_x \leftarrow V_y$	$V_x \rightarrow V_y$	$\mathfrak{R}_x \leftarrow \mathfrak{R}_y$	$\mathfrak{R}_x \Rightarrow \mathfrak{R}_y$
2 & 1	Pragmatic	Interpretation as sanction	Cathexis	Prudential generalization	Pragmatic experiment
2 & 3	Ethical	Interpretation as duty / as responsibility	Identification / Loyalty	Categorical command	Categorical judgment
1 & 3	Expressive	Representation	Symbolization	Incarnation	Sublimation

Table VI. Telic systems of discourse: Combined systems.

SYSTEM No. No. NAME	SUBJECTIFYING OPERATION	CRITICAL VALUES  HERMS	FOCAL REGION <i>Definition of subject (Self)</i>		FUNCTIONAL RELATIONS  RULES OF WARRANTABILITY	
			INTERNAL <i>Anima</i>	EXTERNAL <i>Persona</i>		
2 & 1	Pragmatic	Engagement	Constraint	Regulator	Producer	Prudential rule
2 & 3	Ethical	Calling / Appointment	Norm	Mission	Office	Categorical rule
1 & 3	Expressive	Posture	Stigma	Image	Status	Ritual

## Cybernetics

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  351 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 action. 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.

## Cybernetic Phenomenology

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 regulations (*i.e.*, cybernetically). This conception of action is compatible with Parsons' classical definitions, which summarize the humanistic tradition of analysis<sup>14</sup>:

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

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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 action, 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, still prevalent in quasi-evolutionary explanations and engraved 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<sup>15</sup>, to the logical structure of modern theories, e.g. quantum, electromagnetic, relativity and game theories.

## 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 hand, further formal elaboration, it imposes, on the other hand, a rigorous methodological restriction.

The recipe for a meaningful functional analysis is: First, define or discover an essential variable, the value of which in fact remains constant or at a maximum or a minimum 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 violation through laboratory experimentation) the necessary and sufficient set of boundary conditions under which the system occurs, and without which it vanishes.

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:

- a conceptualization of boundary conditions that act as sources of disturbance;
- a specification of systems of intervening variables, by formulating various processes into which ongoing action can be meaningfully analyzed; and

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- 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

- the specification of the kind of extremum that is maintained (form) and
- 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.

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

Life and meaning 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 to cope and ceases when it is not able to cope with disturbances that push the processes of action beyond systemic limits. “The vital balance,” as Menninger<sup>16</sup> 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 imbalance* that temporarily gives rise to phenomena called life and meaning.

## 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, meaningless activity?

The salient feature of the proposed solution is: 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 inauthenticity*.

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 subprocesses) 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 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. 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.

## SYSTEM AND SIGNIFICANCE

To try to systematize what I was able to absorb from epistemology as well as from biology, psychology and the social sciences, I engaged in a project I call System and significance.<sup>17</sup> A part of the project is an attempt to interpret the development of Indo-European metaphysics as the quest for a general system. As the most recent stage  355 in this quest I regard postmodern systems theory<sup>18</sup>. The present discussion is within this format. I also avail myself of the results of general methodological considerations about the foundations of systems analysis<sup>19</sup>. In an effort to systematically conceptualize the semantic space/time in which conduct or action is said to occur, and to bring some elements of explanation into the perennial discussion, I have attempted to develop a method I call cybernetic phenomenology<sup>20</sup>. On the basis of this analysis I have formulated a framework for a systems theory of experience and action<sup>21</sup>.

## THE CYBERNETICS OF EXPERIENCE

The conception of experience and action presented so far assumes continuing changes in the states, and often in the structure of the key constituents of experience and action. At least some of the system theoretic ideas invoked need to be mentioned here.

Boundary of a system is a locus of points that are neither inside nor outside the system. The boundary of system thus distinguishes between its outside and its inside, *i.e.*, between its outer and inner environment. From this point of view, all the information about the system is at its boundary. The boundary is autopoietic<sup>22</sup>, *i.e.*, the system defines and redefines its own boundary. It is continuously deformed (due to external and internal forces /loads, strain/ and restoring forces at the boundary /stress/<sup>23</sup>. It has a changing coefficient of elasticity and is to a changing degree self equilibrating. It maintains optimal form.

Experience is a deformation of the boundary. Both the self and the world are distributed at the boundary. The boundary distinguishes between the experiences of the indexical I and the indexical it. The hull of the system is the experiential I or the self. The shell of the system is the experiential it, the world or the other. In their transformations, the self and the world are symbiotic and parasitic on the former selves and on the former worlds. The experience of the world and of the self has model layers.

The self and its world progress as a binary system through space-time by an anabolism of indefiniteness into form and form into indefiniteness.

The world is generated and regenerated through the life history of the system. Its trajectory in physical spacetime can be visualized as a swath of possibility (form) within the field of indefiniteness. In semantic spacetime, one can conceive of the history of the self as the anabolism of indefiniteness into form and of form into indefiniteness through a sequence of modal transformations. See Figure 1.



## SUMMARY

In my thinking about experience and action, I have tried to distinguish between things and systems. It seemed to me that not only for the representation of humans and other social things, but in general, a double interpretation as objects and subjects is not only possible but, in the present state of our knowledge, if not necessary, then at least advantageous. The interpretation can be further performed under various metaphors, a quaternion of which seemed to offer itself. Under the metaphor 'mind' I constructed  356 scaffolding for a theory of action. I visualize anabolic selves and their worlds in autopoietic and symbiotic development as swaths of meaning in meaninglessness.

Occasionally fragments of the picture I made for myself got published; other segments are 'in progress' or in detailed outline and can be downloaded from my web site.

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Detailed outlines are available as  
[www.richardjung.cz/Work\\_in\\_Progress.pdf](http://www.richardjung.cz/Work_in_Progress.pdf) .

## NOTES

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- <sup>1</sup> Including notably St. Augustine, Duns Scotus, Descartes, Spinoza, George Henry Lewes and Moritz Schlick; Gottlob Frege, Bertrand Russell and Rudolph Carnap; Franz Brentano, Sigmund Freud, Martin Heidegger and Talcott Parsons.
- <sup>2</sup> The basic structure of my thoughts on this topic I set down in 1965 as “Outline of cybernetic phenomenology” in a background document for the Program in Social Systems Analysis I directed at the time at Cornell University.
- <sup>3</sup> [www.richardjung.cz](http://www.richardjung.cz) .
- <sup>4</sup> I have first presented my conception of experience and action as 1962 as “Formal analysis of ideological components of behavior” at the Annual meeting of the American  358 Association for the Advancement of Science in Philadelphia PA. A full blown conception I then presented in 1964 as “The theory of orientation as a special theory of action” at Lazarsfeld’s Columbia University Seminar on Contents and Methods of the Social Sciences, New York NY.
- <sup>5</sup> Jung, 1965b. Also [www.richardjung.cz/65b.pdf](http://www.richardjung.cz/65b.pdf) .
- <sup>6</sup> A conception of the Special Theory of Motivation I first presented in 1962 as “Self-control in a sociological perspective” at the Conference on Self-Control under Stressful Conditions in Washington DC. and a conception of the Special Theory of Decision in 1965 at the Airlie House Conference on Social Conflict in Warrenton VA.
- <sup>7</sup> Jung, 1983c. Also [www.richardjung.cz/83c.pdf](http://www.richardjung.cz/83c.pdf) .
- <sup>8</sup> For the initial formulation of correspondence rules and transfer procedures, cf. Jung, 1965b. Also [www.richardjung.cz/65b.pdf](http://www.richardjung.cz/65b.pdf) .  
For the (2004) revision, cf. [www.richardjung.cz/tab7a3.pdf](http://www.richardjung.cz/tab7a3.pdf) .
- <sup>9</sup> Jung, 1985d. Also [www.richardjung.cz/85d.pdf](http://www.richardjung.cz/85d.pdf) .
- <sup>10</sup> Conduct can be imagined as the activity of a puppet or a zombie (an antonym of a ‘person’ in the sense used recently by some philosophers) regulated by external (institutionalized) or internalized conventions.

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- <sup>11</sup> As *sive* in Spinoza, meaning *either/or* or *and/or*.
- <sup>12</sup> These include: systems of orientation, discourse, judgment (acceptance and rejection of statements) and utterances; epistemic and telic systems; subjectifying operation, critical values, focal region (internal and external definition of subject (*of self as anima or persona*),; functional relations, and rules of correspondence (*between terms as well as herms*) and transfer procedures (*of intelligibility and warrantability*).
- <sup>13</sup> Taken from the 2004 revision of „Systems of Orientation“.  
Cf. [www.richardjung.cz/tab7a3.pdf](http://www.richardjung.cz/tab7a3.pdf) .
- <sup>14</sup> Cf. Jung, 1984b. Also [www.richardjung.cz/84b.pdf](http://www.richardjung.cz/84b.pdf) .
- <sup>15</sup> Hero, or Heron of Alexandria, lived perhaps around 150 BC.
- <sup>16</sup> Karl Menniger *et al.* 1963. *The Vital Balance*. The Viking Press. New York.
- <sup>17</sup> For an outline of System and Significance see [www.systemsresearch.cz/SS0.pdf](http://www.systemsresearch.cz/SS0.pdf) .
- <sup>18</sup> Jung, 2005f. Also [www.richardjung.cz/05f.pdf](http://www.richardjung.cz/05f.pdf) .
- <sup>19</sup> Cf. [www.richardjung.cz/SS1.pdf](http://www.richardjung.cz/SS1.pdf) .
- <sup>20</sup> For a detailed outline, cf. [www.systemsresearch.cz/SS4.pdf](http://www.systemsresearch.cz/SS4.pdf) .
- <sup>21</sup> For a detailed outline, cf. [www.systemsresearch.cz/SS6.pdf](http://www.systemsresearch.cz/SS6.pdf) .
- <sup>22</sup> Imagine, if you please, that such autopoiesis of a boundary occurs during the development of a mammalian embryo, when the ectoderm emerges. The ectoderm transforms into various tissues, particularly the skin and the nervous system.
- <sup>23</sup> Jung 1989a. Also [www.richardjung.cz/89d.pdf](http://www.richardjung.cz/89d.pdf) .
- <sup>24</sup> Reprinted as: 1988a. The structure of social action: In memory of Talcott Parsons. *Systems Research*, 5, 3: 255-259; 1989g. Struktura działania społecznego ku czci Talcotta Parsonsa. Translation into Polish by Andrzej Kublik. *Prakseologia*, 4 (105): 231-242; 1992a. Struktura sociálního jednání (Na paměť Talcotta Parsonse). Translation into Czech by Tomáš Hájek. *Studia Humanistica (Časopis pro filozofickou antropologii)*, 5/1992: 71-82.
- <sup>25</sup> Reprinted as: 1987b. A quaternion of metaphors for the hermeneutics of life. In: J.A. Dillon, Jr. (Ed.). *General Systems, Yearbook of the International Society for General Systems Research*. Louisville KY: International Society for General Systems Research, XXX: 25-32.

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