

Systems of Decision

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ABSTRACT

This paper reports my progress in modifying the classical theory of decision and rationality in order to make it more compatible with reported experiences and observed actions of decision makers, as well as in restructuring it so that it would fit as a module into a theory of intention (experience and action) that I am trying to construct.

INTRODUCTION

A system of decisions — as outlined here — is a module in a system of intentions. A system of intentions is composed of several levels of subsystems. There are sub-systems of experience and action, interaction and transaction, and on a lower level, sub-systems of orientation, motivation and decision. There are yet further levels and modules.

Systems in-exist in the mind⁴ as n-ary relation, *i.e.*, sets of variables and sets of relations on these variables. The set of variables defines the space of the system; the set of relations its structure. The space of the system can be used as a conceptual scheme to interpret phenomena; the structure of the system as a theory to explain them.

Usually, only some of the phenomena under consideration are successfully interpreted or explained by any particular system. The power of a system can, on the one hand, be increased by modifying its property space and/or its structure. This is a monistic epistemological strategy. On the other hand, its limitation can be accepted and the phenomena not adequately covered by it can be interpreted and explained by other relevant systems. This is a pluralistic epistemological strategy.

A system of decisions should contain adequate conceptual and structural features of decision and still be conceptually and formally compatible with other modules of the system of intentions.

2 Papers in Progress 245A-78. Center for Advanced Study in Theoretical Psychology, University of Alberta, Edmonton AB, 1978.

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⁴ Brentano, taken from the Scholastics.

Already Pareto, one of the founders of modern economics, has emphasized that a theory of decision postulating economic rationality has limited explanatory power as a theory of human action. He therefore enlarged the scope of decision theory by including psychological, social and cultural elements that he called residues and derivations.⁵ Since at the time he did not have much psychology and social science to draw on, he eventually formulated his own sociology, and thus became one of its founders. I follow an approach consistent with Pareto. Rather than struggling to apply classical economic theory of rationality to non-economic aspects of actions, I attempt to formulate psychologically and sociologically relevant variations in, and deviations from, the classical model.

In this exploration, in order to increase the interpretative and the explanatory powers of the system of decision beyond its classical formulation in economic theory, I shall first employ a monistic and then a pluralistic epistemologically strategy:

- some strictures of classical economic decision theory will be relaxed in order to enlarge the scope of a system of decision;
- the two other subsystems of experience and action — a system of orientation and a system of motivation — will be offered to help to interpret and/or to explain aspects of action still unaccounted for by the expanded system of decision.

SPECIAL THEORY OF DECISION

A nearly fully developed “Special theory of decision” has been presented by me in 1965.⁶ The current text is very closely based on a detailed outline I wrote in 1962 in Pittsburgh and that I integrated later, at Rutgers and at Cornell, into a conception of a general theory of action with three special theories, one of which was a theory of decision.⁷ I have since then presented the theory of decision within the integrated theory of action in various graduate courses and interdisciplinary seminars as well as in profes-

5 Pareto in his *Trattato di sociologia generale* (1916) asserts that human action can be reduced to *residues* and *derivations*. People act on the basis of non-logical sentiments (residues) and invent justifications for them afterwards (derivations).

6 R. Jung. 1965c. "Types of decision and intervention." Airlie House Conference on Social Conflict, Warrenton VA.

7 R. Jung. 1965d. *Outline of cybernetic phenomenology*. Background Document. Program in Social Systems Analysis. Cornell University, Ithaca NY.

sional conferences.⁸ Since 1965, my formulation has undergone only some few minor additions or terminological changes.

Key concepts and distinctions in the classical as well as in the modified formulations of the theory of decision are next presented in a series of tables that are then discussed.

CLASSICAL FORMULATION OF THE DECISION PROCES

TAB. 1. CLASSICAL DESCRIPTION OF THE DECISION PROCESS.

Space of alternative actions
Set of relevant outcomes
Estimate of probability P of outcome of each action A
Estimate of desirability D of outcome of each action A
Utility of an outcome of A = combination of its P & D

Table 1 summarizes the classical formulation of the decision process. It is a conceptual scheme for the interpretation of the decision process and a framework for a descriptive decision theory. Such formulation of the decision process proposes that:

- an actor constructs a space of available actions;
- defines a set of outcomes of these actions;
- estimates the probability and the desirability of the outcomes of the available actions;
- combines the probabilities of outcomes with their desirabilities and thus arrives at estimates of the utilities of the outcomes of the available actions.

TAB. 2. VARIANTS OF THE CLASSICAL DECISION PROCESS.

ESTIMATES	Absolute		Conditional
	Objective		Subjective
DECISIONS UNDER	Certainty	Risk	Uncertainty

⁸ For example: R. Jung. 1973. "Four cybernetic principles of action." Meeting of the Canadian Sociology and Anthropology Association, Kingston ON.

In Table 2 are first shown variants of the decision process that differ in the way estimates are arrived at. In classical rational decision theory, different kinds of statistical procedures are employed to arrive at an estimate.

- Absolute estimates are arrived at without taking account events that have occurred earlier. They are sometime called unconditional estimates.
- If the estimate is called conditional, if it depends on prior occurrence of another event (or other events),.
- An estimate is called objective if it is invariant (or at least covariant) under a transformation of subjects. It is sometime called intersubjective since it is postulated that any subject would make the same assessment..
- It is called subjective if the assessment is based on the individual decision maker’s personal judgment about the outcome of an action. Though not based on a common assessment procedure, it can be a reasonable judgment by a decision maker who has good knowledge of the decision situation, and may be regarded by himself and others as an expert.

There are also differences between decision processes (and in rational decision theory in computational techniques) if:

- the outcome of an action is estimated to occur (or not to occur) with certainty;
- the probability of the occurrence of an outcome can be estimated (and is other then one or zero), *i.e.*, the action is associated with risk;
- the probability of the occurrence of an outcome cannot be estimated, *i.e.*, the action is associated with uncertainty.

TAB. 3. CLASSICAL DOCTRINE OF RATIONALITY.

Probability P and desirability D of any action A are estimated independently of each other	$P_A D_A$
Utility U of action A is obtained by multiplying its P by its D	$U_A = P_A \times D_A$
Action A with the highest value of utility is chosen	$A = U_{max}$

Table 3 summarizes the classical doctrine of the rational decision process. A decision process is defined as rational if probabilities and desirabilities of the outcomes of available actins are estimated entirely independently of each other ($P | D$). The estimate of utilities is obtained by multiplication of the values of probabilities and desirabilities of outcomes ($P \times D$).

The actor decides rationally if he maximizes utility, *i.e.*, chooses an action whose outcome has the highest estimated utility ($A = U_{\max}$).

This doctrine is also regarded as the normative theory of decision. A difference between the description of the decision process and the doctrine of rationality is the degree of specification of the decision system. The description of the decision process specifies only generally the variables and the relations of the decision system. The doctrine of rationality defines the variables P and D as dimensions of an orthogonal decision space. It introduces a metric by requiring that the states U of this space are matrix combinations of P and D . It further defines the form of the system as functional: P and D are the intervening variables and U is the dependent (or essential) variable of the system. Since variational analysis can be applied to a functional system, the value of U can be computed as an extremum (as a constant or as the minimum or the maximum) possible under certain boundary conditions. The boundary conditions are the values of independent variables.

We may, if we wish, regard the rational doctrine as a descriptive theory (as many economists do). We can then assess to what extent actual decisions are explainable by it under different circumstances. Classical economic theory of decision may give us the best normative criteria of what constitutes a rational decision process. But it has its limitations as a descriptive theory of the actual decision experiences and actions of individuals as well as of the deliberative and executive processes of aggregate actors. It does not adequately account for their experiences and actions — neither when confronting real situations, nor when they participate in games and markets. It is based on several counter-intuitive, psychologically and sociologically unwarranted assumptions.

A MODIFIED CONCEPTION OF THE DECISION PROCESS

Rather than listing and discussing these assumptions, I shall present a view of the decision process implicitly based on biological, psychological and sociological assumptions that I consider more plausible. The basic concepts of the classical formulation of the decision process — action, space of available actions, probability, desirability and utility of outcomes, subjective, objective, absolute and conditional estimates, certainty, uncertainty and risk, as well as rationality — shall be retained, but somewhat modified.

MONISTIC STRATEGY

With monistic epistemological strategy one tries to enhance the power of a system by modifying its property space and/or its structure. I shall first distinguish between idiocratic and xenocratic decision processes. Next, the classical requirement of rationality will be relaxed. This will allow the identification of different kinds of decision makers, decision processes and rationalities.

Idiocratic and xenocratic decisions

Concepts of free will and autonomy are often conspicuous in ideological and philosophical discussions of decision making. While I abstain from any discussion of free will, the consideration of autonomy belongs into the present discourse. If autonomy were to mean that one's decisions are independent of one's situation, then action would become inflexibly enslaved to the states or habits of the decision maker. This is reflected in the theoretical problems of character in psychology and of social role and the repertory of available responses in sociology. In psychoanalytic theory it centers on the concept of the superego. In Heideggerian existentialism it is inherent in the notions of authenticity, *Geworfenheit* and *das Mann*.

We shall steer clear not only of the conception of man as Homo Economicus, but also of the conceptions of Homo Psychologicus and Homo Sociologicus. Nevertheless, the important differences between egocentric and allocentric actions should be acknowledged. The concept of the Self is central to any theory of an entity that acts in a semiotic space-time, and therefore to a theory of intention, experience and action. Indispensable for a theory of social experience and social action is the concept of an Other. An Other is an entity in semiotic space-time, to which the same basic properties are attributed as to the Self, *i.e.*, intentionality, experience, action etc. The concepts 'Self' and 'Other'⁹ shall be used but not reviewed here. A familiarity with their usage shall be assumed.

9 In Parsons' treatment of action, the terms Ego and Alter are used in the same sense.

TAB. 4. TYPES OF DECISION PROCESSES.

IDIOCRATIC	XENOCRATIC
Probability of outcome	Credibility of Other
Desirability of outcome	Potency of Other
Utility of outcome	Strength of command
Resoluteness in executing chosen action	Compliance in executing commanded action

Two fundamentally different decision processes can be distinguished: an idiocratic and a xenocratic decision process. The names of both processes are derived from Greek *kratos* — strong, powerful, dominant. The name idiocratic is derived from Greek *idios* — I, me, myself, self, peculiar to oneself. The term xenocratic is derived from Greek *xenos* — another, a stranger, an alien, a guest, a ghost, a phantom. When the two types of decision processes are formulated as functional systems of decision, each will have a different functional subsystem (intervening variables), a different essential (dependent) variable and a different criterion of rationality. The differences between these processes are shown in [Table 4](#).

An idiocratic decision process is one in which the process is governed by the actor's Self. In an idiocratic decision process the actor himself estimates the probability (contingent on an action) that an outcome will occur and how desirable to him he will deem it. He himself combines these two estimates to assess the utility of an action. Whether he will carry out the action with the highest utility (whether he will act rationally) will depend on his resoluteness in adhering to the outcome of his decision process.

A xenocratic decision process is one in which the process is governed by an Other. This can be a real or an imagined Other; an Internalized or an Institutionalized Other. In a xenocratic decision process the actor estimates the credibility of Others (to what extent do their ostensible intentions correspond to their real intentions). He also estimates their potency (their ability to carry out their intentions). He combines these to arrive at an assessment of the strength of their commands. Whether he will carry out the command with the highest strength (whether he will act rationally) will depend on his discipline in performing the action selected by the xenocratic decision process.¹⁰

¹⁰ Xenocratic decision process is thought to determine actions described, for example, in terms of imitation, frames of reference, reference groups, emotional contagion, panic, stampede or guidance by dreams or oracles.

There are several bases of compliance. In case of an Internalized Other, it is often discussed as strength of character or of the superego. When a concrete interacting Other is involved, we consider the loyalty of the actor to him, or the stability of the coalition they form. This is amply considered in game theory, e.g., in the Prisoner's Dilemma game. There is compliance based on a threat of physical intervention or punishment or on a mental threat of withholding protection or grace. In all cases coercion consist of the structuring of an actor's action space by an Other.

A concrete, an abstract or a formal¹¹ Institutionalized Other is said to be endowed with authority, *i.e.*, can legitimately issue commands. Compliance with his commands is based on discipline.¹² Authority can be based in a belief endowing an Other with charisma. His credibility and/or potency are felt to be a result of his access to mystery: to a realm of knowledge and powers principally inaccessible to the actor.¹³ Such privileged pipelines are claimed by would be shamans or leaders. Authority can be ascriptive, *i.e.*, based on age, sex, class, cast, ethnicity or unusual appearance. Aristocrats, bureaucrats, professionals, clergymen and military officers claim authority derived from a calling or an appointment to an office. There is a tendency for authority to become institutionalized by repeated exercise.¹⁴

Whether an actor decides idiosyncratically or xenocratically depends on his previous experiences, primarily on his socialization. In early socialization, a united front on part of the parents engenders xenocratic decisions by the child. During later socialization, such tendency is reinforced by experiences in conventional, custodial or authoritarian organizations and in politically paternalistic or authoritarian societies. Decisions are made under xenocratic certainty. On the other hand, a divided front between parents and/or between any significant Others will produce situations of decisions under xenocratic risk. It is cororally that actors will decide idiosyncratically only to the extent that they are exposed to conflicting commands, *i.e.*, under xenocratic risk. They will also learn to decide idiosyncratically in situations in which commands are not available or are irrelevant, *i.e.*, under xenocratic uncertainty.

¹¹ Rules of grammar or of mathematics (e.g. multiplication tables) are examples of formal Institutionalized Others..

¹² Examples are the military concept of discipline (willing subordination of one's will to the responsible and superior will of another) or Durkheim's conception of an extra-contractual element that assures the willingness to comply with a contract.

¹³ Omens, throws of dice and inner voice or voices (conscience or hallucinations) are examples of felt access to superior knowledge and/or power.

¹⁴ Cf. Max Weber: The institutionalization of charisma.

Within the theory of intention I postulate that xenocratic rather than idiocratic decision processes are primary. This is compatible with the corresponding postulates in the theory of intention as to which motivational and orientational processes are primary. However, actors may appear to decide idiocratically when some Other(s) have been internalized. Situations may occur when compliance is either motivationally or orientationally unacceptable. The actor will become obstinate or actively rebel and decide idiocratically.

The conditions that define the decision process as rational are relaxed. In the idiocratic process we neither assume that the probability and the desirability of an outcome is estimated independently of each other, nor that the utility of outcomes is arrived at by algebraic multiplication of the estimate of probability by the estimate of desirability. In the xenocratic process we neither assume that the credibility and potency of Others is estimated independently of each other, nor that the strength of their commands is arrived at by algebraic multiplication of credibility and potency. We accept that actor's decisions are not entirely rational in the classical sense. Instead we try to construct a decision process which would better account for those of their experiences and actions that are accessible to introspection and observation.

The decision process so conceived still has key abstraction analogous to the classical model of rational decisions. For the sake of simplicity of exposition in the discussion that follows the vocabulary of the idiocratic process shall be mainly employed. However, the vocabulary of the xenocratic decision process could be used equally appropriately.

Kinds of decision makers

Having relaxed the criteria of rationality of decision, we are in a position to consider various kinds of decision makers. These kinds are found within the idiocratic as well as within the xenocratic type of decision process. Each kind has its own rationality of decision or of action.

TAB. 5. KINDS OF DECISION MAKERS.

1	Extremizing	Optimizing
2	Normative	Pragmatic
3	Analyzers	Intuitionists
4	Planners	Opportunists
5	Considerate	Ruthless
6	Anticipators	Procrastinators
7	Identified	Alienated
8	Constant	Fickle
9	Stagnated	Evolving

Table 5 displays nine pairs of contrasted kinds of decision makers and rationalities. The contrasts are not intended as dichotomies. The boundaries between rows and between columns are fuzzy, and the kinds are to some extent overlapping.

1. A decision maker is extremizing, if he prefers outcomes with extreme (i.e., the highest or the lowest) values of probability of occurrence or of desirability. If, on the other hand, he tries to balance the probability of occurrence and its desirability, he is an optimizing kind of actor.
2. Normative decision makers are guided in their choice of action mainly by the desirability of its outcome. Such decision makers are either greedy and can be victims of someone else's or their own confidence game — or else they shy away from highly desirable outcomes to guard against disappointment. If, on the contrary, they choose primarily according to the probability of the occurrence of the outcome, they are classified as pragmatic.
3. Analyzers try to consider systematically as many of available actions and outcomes. They engage, as best as they can, in their version of a rational decision process. The intuitionists, on the other hand feel that they know without deliberation the best course of action in a given situation. Such style of decision has been analyzed in the literature of "command decisions" by military, political, business leaders, sportsmen and artists. It has been discussed already by Aristotle as a separate kind of intelligence.¹⁵ It may also be the result of overlearning when the

¹⁵ Situational appreciation.

global similarity of a new situation with one previously analyzed is unconsciously realized.¹⁶

4. Some decision makers try to compose a sequence of preliminary actions that will make available in the future an action with higher utility than those that are presently available. In their vocabulary we find terms as building blocks, harmonograms, and schedules. They try to modify the action space prior to deciding to act. Their decision process is dominated by their long range goals, aims, intended outcomes. We may call them planners or strategists. On the other hand there are those who choose from the existing action space an action with the current highest utility. They regard their situations as kaleidoscopic. Their decision processes are dominated by the resources available to them (e.g., information, time, actions). We may call them opportunists or at best tacticians.
5. There are decision makers who are considerate of others' legitimate goals, needs or feelings; they choose actions that are conventional, conforming to normative expectations, if not outright altruistic. Then we encounter those who are ruthless. We may experience them as egotistic, psychopathic, not constrained by conventions or norms, without internalized social values.
6. Decision makers may be triggered happy and decide as soon as a course of action appears with any acceptable (satisficing) utility. They are ever ready to seize a chance or willing to take the bull by the horns. Those we may call anticipators (agorhethic,¹⁷ or in Freudian terms expulsive decision makers). Others who will hesitate to act until they assured themselves that the action to be chosen is endowed with high probability and desirability estimates. Those we may call procrastinators (patient, or in Freudian terms retentive decision makers).
7. We postulate what kind the decision maker is. We then assess whether his actions are explainable from his decision process. If they are, we consider such a resolute or disciplined decision maker as identified with his decision process. To the extent that his actions seem to be influenced by irrelevant distractions or a propensity to dissent or to rebel, by negativism, ambivalence, confusion or delusion, we regard such a decision maker as alienated from his decision process.¹⁸

¹⁶ Overlearning may lead to automaticity of response. It may sometime produce "winning streaks", at other times to losing streaks, especially when the responses are neurotic.

¹⁷ From Sanskrit *ajati* (he goes, drives), Greek *again* (lead, act, do), Latin *agere* (drive, lead, act, do).

¹⁸ If the decision process is idiocratic, we may understand the term alienated (in its original Latin meaning, describing an insane person as *a se alienus*) as estranged from own Self. If the deci-

8. Decision makers may be constant in that they adhere to the same kind of decision making. If a decision maker is fickle (promiscuous, chameleonic) and the kind of decision making he engages in will depend on circumstance, whim or be random.
9. All decision makers will change the configuration of the kinds of decision processes with their neural and social development, *i.e.*, with time, experience and condition. In this perspective, a decision maker and may stagnate or evolve.

Any actor at any one time is likely to be a combination of the above kinds of decision makers.

PLURALISTIC STRATEGY

Even a system of decision as enhanced above has limited interpretative and explanatory power. This can be accepted as inherent in the system and, employing a pluralistic epistemological strategy, the phenomena not adequately covered by it can be interpreted and explained by other relevant systems. My pluralistic strategy is built directly into a triune conception of the system of intentions. A system of decisions is formulated as a module of a system of intentions. It should therefore not only contain adequate conceptual and structural features of decision but also be conceptually and formally compatible with other modules of the system of intention. The integration of the modules is complex and only some aspects of it will be described.

- The complementary interpretations of the term 'intention' will be delimited.
- The interpretation of the system of intention as a system of experience and/or a system of action and its triune construction out of its subsystems will be sketched. The principles of their management will be identified.
- A major distinction in the theory of orientation between epistemic and telic orientations will be drawn upon.
- Drawing on the theory of orientation to distinguish between exo- and endotelic decision processes. Decision situations will be classified into static, transitional and transformational. An actor's inability to recognize the intention of the decision process and/or the decision situation may increase the risks involved.

sion process is xenocratic, we use the term alienated (in the derived sense for deviance) as estranged from relevant authority.

- The difference between epistemic and telic certainty, risk and uncertainty will be introduced in the formulation of the decision process. In the classical model the actor estimates the probability and the desirability of outcomes. In the modified model, he also needs to estimate the probability that the outcome will be desirable when it occurs.
- The consequent replacement of utility by combined epistemic and telic risk as the essential variable of the system of decision will be suggested.
- The combined risk, or expectation, will be proposed as the conative element of intention that generates experience and action.

Eights, the inputs to action of the three subsystems.

Finally, gradients of experience and action.

Intention

Intention is used in different ways in different contexts (is polysemic) by different authors at different times. Even here I use it as an internally complex concept.

TAB. 6. JANUS FACES OF INTENTION.

Subject	↔	Object
INTENTION		
Experience		Action

Table 6 displays the two different levels of bipolarity of the concept of intention.

The top row of the table represents the concept of intention as the relation (↔) between a subject and an object. This understanding of the concept acknowledges the bipolarity of the noetic and the noematic pole of experience in the Husserlian phenomenological tradition.

The bottom row represents the bipolarity of intention as a disjunction (|) between experience and action.¹⁹ These are two distinct and complementary forms in which intention manifests itself. The inner aspects of intention are to various extents accessible to introspection and are interpreted as systems of experiences. The outer aspects of intention are to various extents accessible to external observation, and are interpreted as systems actions. The distinction between experience and action as two

¹⁹ The distinction between experience and action as two forms of intention corresponds more to the understanding of the concept in some psychological, social-psychological and sociological traditions.

forms of intention corresponds more to the understanding of the concept in some psychological, social-psychological and sociological traditions.

In the present text 'intention' indicates a relation between a subject and an object that takes the complementary forms of experience and/or of action.

Systems and subsystems of intention

A system of intention is interpretable as complementary systems of experience and/or action. It has three analytic subsystems: orientation, motivation and decision. Within each complementary interpretations are possible, mirroring the complementarity of experience and action.

TAB. 7. THE TRIUNE SYSTEM OF INTENTION

SYSTEM OF	MANAGEMENT OF
Intention	Inauthenticity
<i>Orientation</i>	<i>Uncertainty</i>
<i>Motivation</i>	<i>Tension</i>
<i>Decision</i>	<i>Risk</i>

Table 7 presents in the left column a system of intention and its subsystems²⁰. The four systems are conceived as functional systems each with a dependent essential variable. In the right column are listed the names of the essential variables that are being managed.

Functional analysis is concerned with variations in the essential (dependent) variable(s) while different functional subsystems (of intervening variables) operate under different boundary conditions (values of relevant independent variables). Each principle of management of is of the form: extremize²¹ through a functional subsystem the value of the essential variable as much as is possible under existing boundary conditions.

A system of intentions (experiences and actions) is managed by a principle of maximum possible reduction of the inauthenticity of the actor. This principle governs the interplay of the three analytic subsystems into which it is decomposed. The interplay of the three subsystems consists of setting boundary conditions for each other.

²⁰ Since the overall conception of the system of intention, experience and action and of its subsystems has been described or outlined at greater length elsewhere, only those features necessary to further the discussion of decision will be presented here.

²¹ Keep constant, maximize or minimize.

Each subsystem is governed by its own variational principle of management. Reduction of the essential variable specific to the system is in each case limited by the boundary condition set by the values of the essential variables of the two other subsystems. These analytic subsystems are the system of orientations, the system of motivations, and the system of decisions. Orientation reduces uncertainty, motivation reduces tension, and decision reduces risk.

This text concerns systems of decision formulated within the context described above. In this formulation, systems of decisions as part of systems of intentions (experiences and actions) are modeled on the classical decision theory. The requirement of rationality is relaxed. The system of decision is reformulated to fit as subsystem into the systems of experience, action and intention.

Epistemic and telic orientations, discourse and judgments

For a further reformulation of the decision process within the system of intention we need to review the distinctions between epistemic and telic orientation, discourse and judgment as they have been formulated in my theory of orientation²².

²² Cf .R.Jung:
1962d. "Formal analysis of ideological components of behavior." *Annual meeting of the American Association for the Advancement of Science*, Philadelphia PA;
1964a. "The theory of orientation as a special theory of action." *Columbia University Seminar on Contents and Methods of the Social Sciences*, New York NY;
1964b. *Systems of orientation: A preliminary Conceptualization*. (A Working Paper in the Functional Theory of Orientation.) In: M. Kochen. *Some Problems in Information Science with Emphasis on Adaptation to Use Through Man-Machine Interaction*. Final Report for Air Force Cambridge Research Laboratory (Vol. I of II). IBM Th. J. Watson Research Center, Yorktown Heights, NY, 1964. Appendix IV A. 113-149;
1965b. *Systems of orientation*. In: M. Kochen (Ed.), *Some Problems in Information Science*. New York NY & London UK: The Scarecrow Press, 67-93;
1977d. *Systems of orientation: A revision. Papers in Progress 236A-77*. Center for Advanced Study in Theoretical Psychology, University of Alberta, Edmonton AB.; 2004f. .

TAB. 8. FROM SYSTEMS OF ORIENTATION.

COMPLEMENTARY		
Operators	Discourse	Judgment
<i>Emphasizing</i>	<i>Relevance space</i>	<i>Subjective</i>
<i>Polarizing</i>	<i>Focal region</i>	<i>Intentional</i>
Subjectifying	Telic	Self
<i>Annihilating</i>	<i>Possibility space</i>	<i>Objective</i>
<i>Neutralizing</i>	<i>Universe</i>	<i>Absolute</i>
Objectifying	Epistemic	Other

In Table 8 some central notions in the theory of orientation are represented. According to the theory a set of operators on indefiniteness generate form. Form is manifested in successive layers of orientation, discourse and judgment. A small subset of these operators distinguishes between epistemic and telic orientation, discourse and judgment.

The emphasizing operator selects a relevance space. The polarizing operator distinguishes a focal region within it. These two operators are together subjectifying and constitutive of telic orientation, discourse and judgment. Telic judgments are subjective and intentional in that they refer to a Self bounded in the focal region of the relevance space.

The annihilating operator defines a possibility space (in which emphases have been annihilated). The neutralizing operator specifies a universe (from which the boundary of the focal region has been neutralized). These two operators are together objectifying and constitutive of epistemic orientation, discourse and judgment. Epistemic judgments are objective²³ and absolute²⁴ in that they apply to any Others dispersed through universe.

Epistemic and telic judgments are different from decisions as discussed here. They are, for example, assertions whether statements in the epistemic discourse are to be accepted or not accepted (as actual, meaningful, necessary, real, or ideal). They are convictions about the degree of trustworthiness (sufficiency, efficiency, validity) of epistemic experience (of what is). They are feelings of the righteousness or of the illicitness (anxiety, guilt, shame) of telic experience (of what ought to be).

²³ Detached, alienated, inter-subjective, co-variant under transformation of Others.

²⁴ Transcendent.

Outputs of the system of orientation are the boundary conditions of the system of decision. They translate into the basic terms of the decision process, such as space of available actions, decision maker, estimates of probability of outcomes and of credibility of Others.

Outputs of the system of motivation (not to be reviewed here²⁵) are also boundary conditions of the system of decision. The kinds and amount of tension manifested by the motivation system translate into terms of the decision process, such as choices between xenocratic and idiocratic decisions, and desirability of outcomes or of potency of Others.

Sense of a decision process

In theorizing about experience and action (the relation between the actor and his situation) one may distinguish four kinds: an action when the situation of the actor is experienced as his environment, a physical action, when the situation of the actor is experienced as consisting of objects, a social action when the situation of the actor is experienced as an other actor, and a psychological action when the actor's situation is experienced as the actor himself.

Similar distinctions can be made between the intentions of a decision process²⁶.

TAB.8. SENSE AND SITUATION OF A DECISION PROCESS.

SENSE	EXOTELIC		ENDOTELIC
RELATIONS	DIRECT		REFLEXIVE
SITUATION	STATIC	TRANSITIONAL	TRANSFORMATIONAL

In the top row of Table 8 are listed the two varieties of the sense of a decision process. A decision process has an exotelic sense if it is governed by outcomes outside of the decision maker. It has an endotelic sense if it is governed by outcomes within the decision maker himself.

²⁵ Cf. R. Jung. "Stress and related concepts in physics and the social sciences". International Journal of Systems Research and Information Science. Vol. 3, No. 2 (1989), pp. 59-72. A revision of paper (1985a) "Stress and related concepts in physics and social science" presented to the session on 'Family Theory' at A Multidisciplinary Conference on Family Stress, Family Growth and Family Practice, Vancouver BC. Some of the ideas published in this paper were initially presented in Jung (1962a) and originally published in Jung (1965a).

²⁶ One could also speak of a different *meaning or purpose* of the decision process.

The second row of the table distinguishes between different relations between the decision maker and his situation. In an exotelic decision the relation between the decision maker and the situation is direct. In an endotelic decision process the relation is reflexive. A decision situation becomes reflexive, if the outcome sought is a change of the Self or of an Other into a different kind of decision maker. An endotelic decision treats outcomes outside the decision maker as boundary conditions of the process or as a part of the functional subsystem. Only outcomes within the decision maker are treated as essential variables. Endotelic decisions are decision maker oriented and didactic.

In the last row, decision situations that are perceived as same or stable are distinguished from those that are changing.

A decision situation is static if no relevant elements in it have changed, so that it does not require²⁷ any changes in the decision maker, in the space of available actions or in the assessments of probabilities and desirabilities. If it is a game, partners or rules are assumed to be same or interchangeable. Decision making in static situations is routine. We make consider the decision situation as static, if the actor remains the same kind of decision maker, the Others remain the same kind of decision makers, and the decision space (available actions, and the probabilities of occurrence and of desirability of outcomes) remain similar. This happens in the routinization of decision making to the point that a response to a recurring situation has become an artistic style, a tradition or a codified craft and interactions that have been repeated with complementary expectation have become institutionalized.

It is transitional if any of the above elements change (or keep changing) continuously and an equilibrium of a decision craft or an institution has not been reached yet.

It is transformational, if the changes are discontinues (step functions). The decision situation requires special changes (the decision maker whose impact on the conditions, on the rules of decision or interaction game) or on the actor is, may be, or could become profound or catastrophic.

Different kind of decision making may seem advantageous and different sorts of estimates, judgments and choices may appear appropriate in decision processes that have different intentions.

Yet these distinctions are fuzzy and hard to make both for a decision maker as well as for an outside interpreter. Strictly speaking, the determination of decision processes is not part of the theory of decision, but an

²⁷ Egon Brunswik: *Erforderungscharakter der Situation* (demand characteristics of the situation).

interface between it and the theory of orientation. Its discussion belongs to a description of a decision system.

Examples abound, yet it is difficult not to mislead by giving them.²⁸ Since the boundaries between situations are fuzzy and are sometime hard to discern, a possibility of misclassification of a situation exists with potentially important consequences.²⁹

²⁸ When prices are stable and a customer goes to the same store, a decision situation is static. When the children are gradually growing and developing, spouses and friends are gradually getting older or prices are slowly going up or down, the situation is transitional. A situation is transformational when children change substantially because of attending school and involvement with peers, puberty, marriage or cohabitation, move out, get gainfully employed, retire and die. In some cultures such changes are marked by rites of passage. It becomes transformational when spouses or partners get employed or unemployed, are unfaithful or divorce, retire, get chronically or terminally ill, die. When prices get deregulated, there is a financial reform, and savings get wiped out or big gains accrue due to inheritance or lottery win is a transformational situation that is often it is accompanied by change of residence and of peer group. Major political or social changes, such as coups, revolutions, or economic depressions or physical catastrophes such as earthquakes, may lead to other transformational situations, beside those mentioned already, such as inner or outer emigration or major changes in political or social status. Interesting are reflexive transformational situations. They occur when the decision maker takes religious or wedding vows, gets divorced, enters or deserts a monastery, army, or an underground movement, signs a contract, or decides to get castrated or to change gender. When the intention is endotelic, but concerns the transformation of an Other, as examples may be regarded domestication, toilet training, obedience training, independence training (via exposure to reality), and of course brainwashing and coercion via a transformation of the Other's situation.

²⁹ Perhaps two examples of misclassification of a decision situation may suffice. (1) Children who went through transformational changes are treated by their parents as if they still were in some other stage. (2) In the 1930's and 1940's the majority of European Jews treated the advent of Hitler and Nazism as a static situation, denying the substantial increase of expressions of anti-Semitism, or later on, as transitional situation, to which sufficient responses were such as a religious conversion, withdrawal from social interaction into privacy and complying with new rules like the Nuremberg laws, wearing of the Star of David star, and ghettoization. Most for a very long time and some never did acknowledge that the situation has transformed to the point that in order to escape death, immigration or revolution (as the belated one in the Warsaw ghetto) was called for.

Epistemic and telic risk

TAB. 9. JUDGMENTS OF PROBABILITY AND DESIRABILITY OF AN OUTCOME OF AN ACTION.

EPISTEMIC	TELIC
certainty	certainty
risk	risk
uncertainty	uncertainty
of the <i>occurrence</i> of an outcome	of the <i>desirability</i> of an outcome

In the system of orientation, statements that are expressions of orientation, discourse and judgments are distinguished. Judgments (estimates) of risk are inputs to the process of decision, *i.e.*, provide one of the boundary conditions for systems of decision. There is a difference between orientations, discourse and judgments that are epistemic or telic. In a theory of decision, it is therefore necessary to distinguish between epistemic and telic judgments of certainty, risk and uncertainty of the outcomes of possible actions.³⁰

Epistemic judgments concern the occurrence of the relevant outcome after the cost in information, time, energy and other resources has been incurred and an action has been taken. They express the certainty, risk or uncertainty of its occurrence. Epistemic risk in decision theory is stated as a probability occurrence.

Telic judgments concern the desirability of the relevant outcome after the cost in information, time, energy and other resources has been incurred and an action has been taken. They express the certainty, risk or uncertainty of its desirability. Telic risk in decision theory is stated as a probability of its desirability.

If an outcome of an action has not been experienced (in reality or imagination) before, its desirability is uncertain. If the intended outcome has been experienced before, there is always a telic risk that after the cost in information, time, energy and other resources has been incurred and the action has been taken its desirability may be different from the previous one. While action was underway, its cost and other events may have changed the motivation system. The relevant outcome, although it will occur, may not be as desirable as initially expected. A different output of the

³⁰ Since certainty and uncertainty can be also viewed as evaluations of risk, I shall occasionally use the term risk to include also these as special cases.

motivation system then sets a boundary condition for the decision system.³¹

There are two sets of outputs into the decision system as boundary conditions of the decision process: occurrence from orientation and desirability — as an index of tension — from motivation. When the decision process is integrated with the processes of orientation and motivation, assessment of outcomes consists not only of the probability and desirability of their occurrence but also of the probability of their desirability should they occur.

Decision as reduction of combined epistemic and telic risk

The principle of management of decision has thus been formulated, instead of as maximization of utility, as the maximum possible reduction of combined epistemic and telic risk. It could also be restated as maximization of expectation of the outcome of action under the given boundary conditions.

Expectation and action

According to classical decision theory people choose, or if they are rational, should choose that action the outcome of which has been estimated to have the highest utility. The reformulated decision theory has as its output expectation. Expectation is employed as an equivalent of the medieval concept of *connation*³² or *volition*, which is some urge, drive or act of volition as a cause of a mental or physical effort, *i.e.*, of experience or action.

In the theory of intention it is an expectation that activates and sustains experience and triggers and maintains action. In idiocratic decisions it appears as resoluteness, in xenocratic as discipline.

SUMMARY

The classical formulation of the decision process and rationality has been reformulated in order to (1) anchor it to actual introspectively or ex-

³¹ Repeated disappointments when outcomes achieved after effort and time have been spent on action are no longer as much or at all desirable may induce neurosis. When the desirabilities of actual outcomes turn out to be greater than estimated, an addictive behavior, excessive self-confidence, and a gambling attitude may be reinforced.

³² From Latin *conari*, to attempt or to strive.

ternally observed events when an actor makes decisions and (2) to integrate it as a module in a theory of intention.

First some of the assumptions and strictures of classical decision theory, were removed which made possible the introduction of different kinds of decision processes and decision makers. Then the theory of decision was structured to become a compatible and integral module in a theory of intention.

The hope is that so reformulated, the theory of decision will be better able to interpret and to explain actual decision making as well as to advance the construction of the more general theory of intention.

Among the propositions that can be newly formulated are assertions about the primacy of certain decision processes. It would be compatible with both the theory of decision and the theory of intention to hypothesize that an actor will, whenever possible engage in the xenocratic decision process, make un-conditional (absolute) estimates, assume that the decisions are under certainty, and make exotelic decisions and decisions appropriate to a static situation.