

Processes of constructing judgments and actions by competent individuals with respect to object orientation: Programmatic ideas in the tradition of Brunswikian thoughts

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In the first part of this article, the significance of objects for psychological analysis is discussed. The objects themselves are regarded as tantamount and complementary to subjective processing. The second part describes the powerful role of the organism within a psychology that is partly defined in terms of objects. Finally, I will present a generalized lens model originating from Brunswik's central lens-concept which includes the above mentioned ideas.

(1) The status of objects (as one central aspect of the environment) in psychological research

Objects in their physical, identifiable and checkable realities can be resistant, they can affect action, and can be, in psychological terms, decisively important for human beings, independent of or in addition to their subjective interpretation by individuals. For example, the general concept of the object itself contains both, physical things, the reality of institutions, and the reality of a person's emotions.

The concrete and tangible world outside the organism, outside the focused person can be decisive, resistant and robust even in the light of psychological analysis. One general assumption is that in psychological analysis the objects themselves can be strong indicators or intervening beings, sometimes more important than their subjective transformations which are products of perceptual processes in the individual. The position of object orientation itself, as well as the complementary position of subjective interpretation must be redefined in psychology. Psychological concepts should be partly founded on objects, and should be defined "in terms of objects", following a suggestion already proposed by Brunswik (and others) some decades ago (see Table 1 below). This way of thinking has a long tradition, because it has been founded on theoretical constructs which were formulated mainly in the nineteen-thirties and forties.

The autonomous qualities of objects are quite important for psychological processes and structures. Thus, objects can be regarded as powerful units in psychological analysis. In the psychological ocean objects can be compared to icebergs one must pay attention to. This attention is directed toward the iceberg, not to the processing of it. For the iceberg itself is resistant and dangerous, not the perception of it. In the necessary process of perception both important Brunswikian aspects, distality and proximalty, are components formed of objects.

If we look at the sources that help us construct objects (when analysing the total course of generating them), they are all undoubtedly products of subjective process-chains of individuals (chains which can be long and complicated). The products themselves have nevertheless gained important and solid qualities of their own, which must be separated from the processes of the subjective derivations. Objects are facts which may be relevant in their autonomous qualities for psychological analysis. Therefore, the processes within the organism are undoubtedly subjective, but a person's orientation within such processes is partly directed to or determined by objects mostly independent of subjective decisions.

This position does not mean that perception or cognition could be clearly "objective" in a strict sense; for such a far-reaching assumption of "objectivity" would be completely unreasonable and unrealistic. The aim of "objectivity" can never be reached by human beings. Perception or cognition are created by individuals precisely because they are not able to be "objective". On the other hand, the final results of many individual processes are influenced by objects which may be situated either outside or within the person.

Conclusively, it can be stated that the objects of the environment are a part of the realm of psychology; therefore psychology must be partly defined in terms of objects (the original character of objects must be stressed). This fact leads to the conclusion that the concept of environment in psychological research is twofold: divided in (1) objects of their own quality, and (2) subjective transformations, based on perceptions of objects. This dual line of argumentation was expressed by many researchers, not only by Brunswik (cf. Table 1).

Table 1: Environment consisting of objects and of subjective transformations

(All references in this table are explicated in Wolf, 1995)

Environment: Objects of their own quality	Environment: Subjective transformations
Effects partly independent of individuals	Adaptations by individuals
Object-oriented behavior	Subject-dependent behavior
Haeckel (1866): world outside	

Uexküll (1909-1934): object, world outside, "counter-structure"	Uexküll (1909-1934)
Heider (1926): thing	(Heider (1926): medium)
	Thomas & Thomas (1927)
	Theory of symbolic interaction
Brunswik (1934-1955): environment, ecology	
Koffka (1935): geographic environment	Koffka (1935): behavior environment
Murray (1938): alpha-press	Murray (1938): beta-press
Lewin (1943): boundary zone	Lewin (1940): environment
Rubinstein (1945)	
Chein (1954): environment	
	Rotter (1954): meaningful environment
	Rogers (1959): phenomenal field
Barker (1968): ecological environment	Barker (1968): psychological environment
Wohlwill (1973): environment not in the head	Wohlwill (1973)
	Jessor&Jessor (1973): perceived environment
Lorenz (1973)	Lorenz (1973)
Dann et. al. (1978): potential environment	
Bronfenbrenner (1988): consequences are real	Bronfenbrenner (1979): environment
Magnusson (1981)	Magnusson (1981)
Lazarus (1981)	Lazarus (1981)
J.J. Gibson (1982): affordances	J.J. Gibson (1982): affordances
Aulin (1982)	Aulin (1982)

	Trudewind (1982)
Stokols (1987)	Stokols (1987)
Fuhrer (1990)	Fuhrer (1990)

Object-oriented behavior (see the left side of Table 1) should have been taken into consideration more intensively in psychological theory because this aspect was to some extent neglected in the main stream of psychology. We have to thank Brunswik, Barker, Chein, Wohlwill, and others for their main focus on the meaning of objects for individuals (even if the influence of this conception on today's psychology is still modest). Therefore, I would like to stress the significance of the left side of Table 1 in this article.

On the other hand it is clearly evident that - accepting the importance of the left side - only the combination of left and right side of the table is sufficiently effective. In the psychological analysis the environment always shows both aspects, i.e. both sides of Table 1, simultaneously. Environment is defined by its inherent objects and, at the same time, by the subjective transformations or interpretations of these objects. The acceptance of this duality, and of the necessity of this connection will probably take a long time. I will try to make a small contribution in the attempt to deepen our understanding of this duality. However, the success of this attempt with regard to a development for the future of scientific psychology is doubtful, since the present focus on subjective transformations (the right side of Table 1) is too strong.

(2) The capability of the organism to come to grips with its world

The competent individual

Individuals are generally and in many situations competent (ultimately, in order to survive), but within the framework of such an optimistic estimation of the individual's scope the levels of capability, the sharpness of their "lenses" differ drastically among various people. The central and typical feature of the organism's coming to grips with her/his environment can be seen as a "lens"; this the comprehensive metaphor for the procedure of the most advanced instrument of human "technology". This concise term was preferred by Brunswik to express the multifaceted human competence of an individual to reach focal goals in judgments or actions (often successfully). Following this image we are confronted with an organism which may be - often and typically - active, powerful, and (in many cases) successful within the context and the limitations of powerful objects.

Goal orientation

The pattern of behavior which determines the probabilities of judgments or actions is guided by goals. There is a hierarchy of goals, with one final goal on the top (e.g. survival). Special human interest lies in the identification and utilization of concrete, attainable goals at medium distance. One has to track down such goals, which are unique for her or him and which are mainly situated

in the distal area. "Distality" is a concept which was introduced by Heider and Koffka, but was enriched later on by Brunswik. Concerning goals, Brunswik speaks of "distal focussing". This means that the unique foci of the individual are mainly situated within the environment in medium distance. And: If goal orientation is necessary, then object orientation is implicitly necessary as well.

Virtuosity of exchangeability

An opulent range of possibilities to deal with the environment is available for each individual at any time. Environment is ample, inexhaustible, diverse, and often chaotic (e.g. today's situation with the internet as one part of the environment). Following the main lines of the goals chosen by the individual (in distal distance) each person has to exchange various objects and/or various procedures in a process which is full of virtuosity, resilience, and creativity. There are always several options. She or he will make use of the attractive chance to accumulate, to check, to weigh, to interchange, to select, to question, to utilize partly, to reject, to substitute

- either "cues" (Brunswik) / "indicators" (Hammond) on the input side

- or "means" (Tolman & Brunswik, 1935; Brunswik, 1952) on the output side.

For this virtuosity of exchangeability Brunswik coined the phrase "vicarious functioning" (cf. ["Vicarious Functioning as a Central Process-Characteristic of Human Behavior"](#) ["The structure of the human world: Brunswik's organism-environment-model"](#)).

When the individual deals with the environment, possible solutions in judgments and actions can be regarded as combinations of goal-decision and vicarious functioning

In the course of a life a lot of foci are produced which follow the tendencies of the goals defined by the individual, but which are nevertheless dependant on objects. The extraordinary chance of each individual lies in the utilization of this reference frame of goals by exchangeability within a process of virtuosity (like an experienced piano player). Both in the specific selection of the goals and in the skill of performing vicarious functioning lies the key for the excellent qualification of the "organism" to adapt itself, an aspect which I expressed as "competence" in the title of this essay.

Advantage of the accumulation of experiences

Competence is the interim result of a cumulative process over a longer period; it is able to grow at all times. Accumulation of experience, knowledge and flexibility is a powerful source and potential to gain competence but on the other hand it can also be the source of steps backwards or of wrong decisions. Nonetheless the ability to accumulate aspects of the input is a gift for the organism to deal competently with the environment. Within this context redundancy seems to be

one of the most important necessities in order to stabilize competence. Thus, redundancy is of no disadvantage but rather of great advantage.

"Irreducible uncertainty, inevitable error, unavoidable injustice" (Hammond, 1996).

Three domains of probability

Probability is the formal key concept to establish the processes of constructing judgments and actions. There are several reasons why *probability* is more appropriate than *determinism* in the context of these processes.

(Domain 1) The character of the relations within the **environment** can be best described as processes of probability. This assumption is especially true for all processes between the "proximal" and the "distal" regions (Brunswik) of the environment. The environment itself is "semiratic" (Brunswik) and hardly conceivable for competent but nevertheless imperfect individuals. Therefore, the relations within the environment can be better understood by the concept of probability, and by the Brunswikian concept of equivocality within the environment (see "[The structure of the human world: Brunswik's organism-environment-model](#)").

(Domain 2) The character of the relations within the **organism** can also be best described as processes of probability. The need for probability-processes in the environment finds its counterpart in the need for probability-processes within the organism: This connection can be described as a "lock" (environment) and a "first key" (organism). Even if high attention was paid to the intra-organismic probability-character by Brunswik 50 years ago, as well as by others nowadays (e.g. Gigerenzer), the combination of intra-environmental probability with intra-organismic probability has to be promoted.

Some descriptions of probability within the organism: Probabilistic views suggest

- weighing without certainty (Brunswik)
- the organism is playing or betting (Brunswik)
- the organism is founding on posits (Brunswik)
- the organism works as an intuitive statistician (Thorndike; Brunswik; Gigerenzer; Hammond)
- perception is of probable things (James; Brunswik)
- perception means incomplete evidence (Brunswik; Hammond)
- perception means insufficient evidence (Thurstone).

Some relevant ideas can be found in Brunswik's contribution to the early psychological cognition research (in the first half of the nineteen-fifties), which can be fixed at the two distinct concepts of "perception" and "ratiocination", where ratiocination involves analytical thinking.

Out of this context one can find a lot of ideas proposed by Hammond (1996). Later in this essay I will come back to the beginning of Cognitive Psychology with Egon Brunswik as one member of that group, who could not fully spread his ideas on cognition, because he died too early in 1955.

(Domain 3) The character of the procedures within the **research-process** in science itself should follow the paradigm of probability, as well. Brunswik postulates the necessity of a behavior-research-isomorphism. Because the proximal-distal relationships should be described by probability, and the intra-organismic-processes are probability-gearred, the syntax of the research on the processes of judgment and action itself also has to follow the probability-line. Probability as an integral part of the whole research process is the “second key” to the lock of the semierratic environment. Probability in psychological research can help the organism come to grips with its world, also in a probabilistic manner. For in some respects, research (represented by the outcomes achieved by the utilization of many lenses by many persons) is more powerful than a single lens of one organism (cf. Table 2).

Table 2: Three domains of probability: within the environment, within the organism, within the research process

Domains of probability	Specifications
Within the environment	<p>The “lock”</p> <p>Semierratic</p> <p>Hardly conceivable</p> <p>Proximal - distal relationships</p> <p>Distal - proximal relationships</p> <p>Ecological validity (as defined by Brunswik)</p> <p>“Vicissitudes of the ecology”</p>
Within the organism	<p>The “first key of the lock”</p> <p>Weighing without certainty</p> <p>Playing or betting</p>

	<p>Founding on posits</p> <p>Intuitive statistician</p> <p>Perception is based on probable things</p> <p>Perception is based on incomplete evidence</p> <p>Perception is based on insufficient evidence</p> <p>(Cf. the clear distinction between "Perception" and "Ratiocination")</p>
Within the research process	<p>The "second key of the lock, supporting the first key"</p> <p>Probability as a fundamental principle of the research process</p> <p>"Behavior-research-isomorphism"</p>

Three forms of cognition

Brunswik, and nowadays, Hammond (1996) differentiate between

- Intuition,
- Quasi-Rationality, and
- Ratiocination (phrase of Brunswik); Hammond speaks of "Analysis" or "Analytical Thought" (cf. Table 3).

Both authors recognize the assets and liabilities in both intuition and ratiocination. Brunswik (1966, p. 491) speaks of "brands of virtues and of 'stupidity'". For Brunswik (1966, p. 491) "intuition and irrationality are aspects of rationality".

The term "ratiomorphism" is generally used by Brunswik to classify the rational approach of reasoning and inference. This general approach of "ratiomorphism is far from being rationalism

or intellectualism" (Brunswik, 1966, p. 494). Within the realm of ratiomorphism focal attention must be paid to quasi-rationality. Quasi-rationality is the sphere of perception - and its hitherto unknown relatives in the area of action.

In the latest part of his work (1953-1955), Brunswik (within the context of early research in cognition psychology) refers to cybernetics, information theory, mathematical biophysics, as well as cognition and knowledge.

Table 3: Three forms of cognition: intuition, quasi-rationality, ratiocination

Cognition (Brunswik) Rationality Reasoning, Inference (Ratiomorphism)	Specifications (Brunswik's term "Reasoning" means more than Thurstone's intelligence factor)
Intuition (Creative thinking) Uncertainty-gearred	* Brunswik: uncertainty-gearred * Hammond: answer, solution, or idea without the use of a conscious, logically defensible, step by step process; mysteries of creativity, imagination, pictorial representation of ideas
Quasi-Rationality	* Brunswik: vicarious functioning, limited validity, impressionistic or intuitive judgment, multiple correlation, redundant communication * Hammond: Quasi-rationality (Common sense) Cognitive compromise between intuition and analysis. Imperfect reasoning.

	inconsistency, conflict, error, injustice.
Ratiocination (Thinking) Certainty-gearred (Hammond: Analysis, analytical thought)	* Brunswik: certainty-gearred; high precision and erratic mistakes; highly potent and beneficial, or else disastrous without the benefit of adequate warning * Hammond: analysis, analytical thought, logic, mathematics, rigorous, retraceable thoughts; step-by-step, conscious, logically defensible process. According to Brunswik: assets (precision) and liabilities (catastrophic error).

The powerful tool of the left side of the organism-environment structure: perception

(cf. [“The structure of the human world: Brunswik's organism-environment-model”](#))

A prominent member of quasi-rational-expertise on the left side of the organism-environment structure is perception (cf. Table 4).

Table 4: The essence of perception

<h2>Perception</h2> <p>An excellent and modern, but complicated definition</p> <p>Brunswik (1956, p. 146)</p> <p>“Perception, then, emerges as that relatively primitive, partly autonomous, institutionalized, ratiomorphic subsystem of cognition which achieves prompt and richly detailed orientation habitually concerning the vitally relevant, mostly distal aspects of the environment on the basis of mutually vicarious, relatively restricted and stereotyped, insufficient evidence in uncertainty-gearred interaction and compromise, seemingly following the highest probability for smallness of error at the expense of the highest frequency of precision.”</p>
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Brunswik (1966, p. 492)

“Perception is operationally redefined as a special form of automatic, semistereotyped, imperfect reasoning.”

Brunswik (1966, p. 489)

“Intuitive perception is relative instantaneous, uses vicarious cues and is mostly not quite accurate.”

Brunswik (1966, p. 489)

“The soft and smudgy yet organic ‘ perceptual- error profile is the result of the check-and-balance system of probability-gearred multiple-track mediation.”

Brunswik (1956, p. 89)

“Since perception is not equipped with the necessary added information, its performance must depend on relatively superficial and stereotyped cues of limited ecological validity, preferable a multitude of them; attainment can never be ideal under such circumstances.”

Brunswik (1952, p. 24)

“Cues of perception proper are found to be sluggishly established as probabilistic stereotypes; once established, the act with a quick efficiency full of peculiar pitfalls. More recently, an attempt was made directly to compare perception and thinking in terms of differences in the statistical distribution of error. All evidence may best be summarized by designating perception as a ‘ quasi-rational--rather than a rational system. Perception is what Werner has labeled an analogous function (or process)-- to reasoning, more primitive in its organization but vested with the same purpose (in the behavioristic sense* of this term).” (**Tolman*). In an attempt at rational reconstruction of the ways of the quasi-rational, with its reliance on vicarious cues each of which is of limited validity, one may best refer to a remark of Thorndike comparing the impressionistic or intuitive judge of men to a device capable of performing what is known to statisticians as multiple correlation. This is a device, related to what cybernetics have called redundant communication, by which the probability of individual correctness may be increased but not perfected to the point of certainty.”

We have to search for an analogy to “perception” on the right side of the organism-environment model, on the output side of “action”. Such a central concept must be analogous to perception, also with respect to “ratiomorphism”, or “cognition”. The desired kind of action must be defined as “intelligent” somehow. Cf. Tolman & Brunswik (1935, p. 56), who speak of “means and goal-objects”, which are “bad, indifferent, ambivalent, good”.

(3) Some conclusions

Each person is an active and powerful creator and designer of his/her world - up to the limits set by the environment.

Respecting such an ecological perspective, psychological research has to deal with a combination of individual and subjective intervention and inescapable impacts of the world outside the organism. The “adaptation towards the inevitable” (object) has to be combined complementarily

with the “creative expansion by individual unfolding”.

The compromise between the possibilities of exerting influence by the individual, and of drawing a border defined by the facts of the environment, can be described as a mutual shaping of the world by the active organism.

The significance of creating and shaping the world by subjects is in concordance with the concept of “autopoiesis”, but on the other hand the extreme “radical constructivism” is out of touch with reality, if one accepts the fact of limits set by the environment.

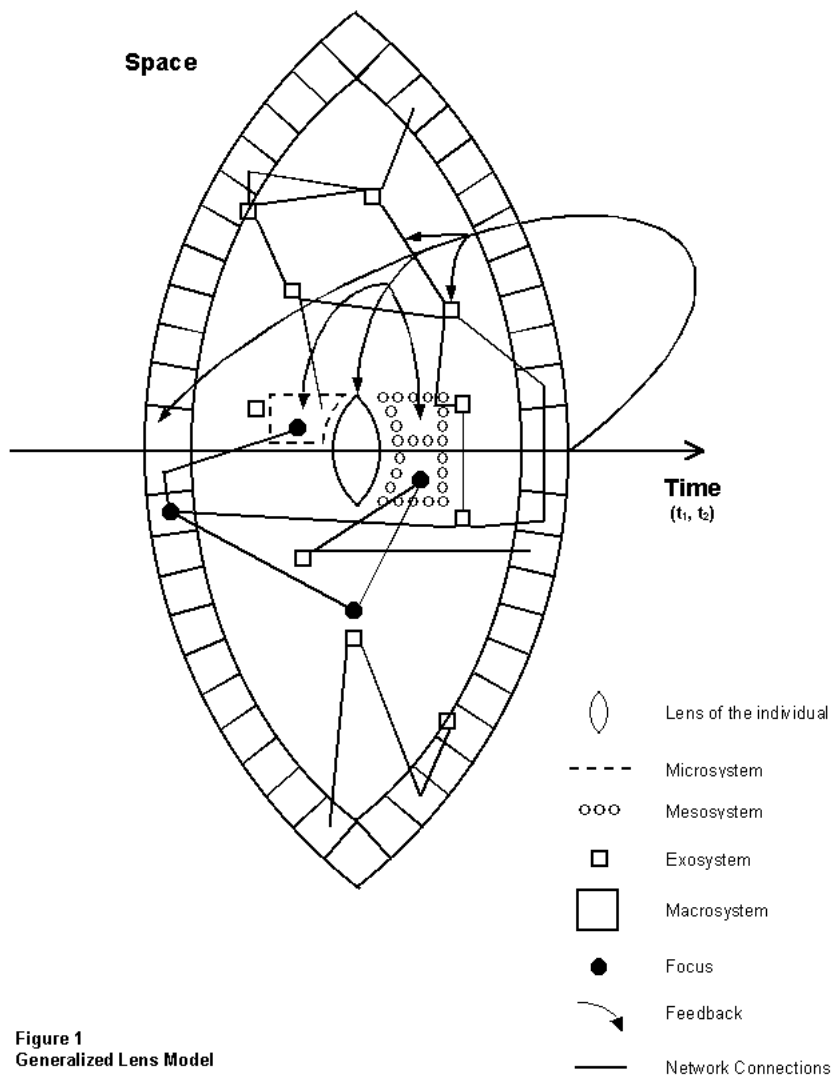


Figure 1
Generalized Lens Model

The construction of judgments and actions must be analyzed within the wide range of ecological areas, structures and processes in a generalized lens model (cf. Figure 1). This model is determined by changing space and changing time. It contains as central elements the individual

lens (of the human being just considered) and the comprehensive regulation mechanism of the whole system which is lens-like, too ("big lens").

Following the arguments at the beginning of this essay, ecology has to be inferred both from object orientation and from subjective transformations. The great variety of the ecology leads to interdisciplinary strategies using multiple modes and multiple models. The "motor" of the whole system is the lens of the individual who is situated in the center of the model. Dealing with facets of the micro- and mesosystem already means that the person in the center has to cope with different lenses of other persons. In the exosystem (and much stronger in the macrosystem), aggregated structures and processes of a lens-like type become effective. These aggregations are decisively shaped by the individual lenses of a small group of persons. Thus, my generalized model of the lens (Figure 1) always includes "the other person" in relations to "the individual in the focus", the "I". Interim-results and compromise-solutions (cf. the great lines of the definition of perception in Table 4) are typical for the whole process in the total system.

The excellent paradigm of the "lens" should be regarded as a generalized process characteristic for the construction of human judgments and actions - individually and in social contexts. The lens is able to deal with a great amount of objects and influences, with divergence and disturbance. On the other hand, the lens shows openness, flexibility and variety, facilitates communication like a network and solves problems of unexpected matters. Its combination of goal direction and virtuosity in perception and action leads to a concentration of essentials, of foci. The richness of complex consequences of the differentiated connections with the realm of the "big" lens (Figure 1) can only be mentioned briefly here.

Repetition and constancy of recent process chains are typical for the lens (cf. redundancy), however, established structures of the lens can change, searching for new paths or condensing "the world" in an unusual way. Dealing with the environment is optimized in a cumulative process. The temporary results are a lot of specific foci which form the "signature" of a person at a given time. However, some fields in the system of the lens are blank. These areas are excluded purposefully by the individual, they are rejected or refused. The resulting profile of disapproval is also an important part of the same signature.

High stability of the total lens system is guaranteed by mutual correction and adaptation of specific lenses in the various subsystems. Even if within the "small" units of the total system inconsistencies and contradictions may be virulent, usually the connections between the specific foci function quickly and efficiently.

Lens systems are often estimated as successful by the individual in the central part in Figure 1. This optimistic estimation can be regarded as a strength, but also as a weakness. When one person's system seems to be a secure and profound basis for action, other possibilities going beyond the individual "home-lens" may be blocked. Therefore, at least parts of the whole lens system have to be questioned at all times. In each society highly stabilized lens systems with strongly affirmative connections have existed, which are highly inadequate in the light of other lens systems (cf. the NAZI-period in Germany).

The generalized paradigm of the lens describes a powerful fact which is highly typical for the

individual - in connection (and rivalry; Brunswik) with the resistant environment. The results of the "small" and "big" lens-processes as such are neither good nor bad. Of course their appropriateness and adequacy must be judged very carefully in each case. But at any rate potential progress and improvement in judgment and action has to utilize the process characteristic of the "always existing" lens.

One step along this way could be the scientific search (and investigation) for the appropriate analogy of "perception" on the output or action side. An answer to this problem should be found.

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