Chapter #20

STATES OF CONSCIOUSNESS: THEIR NATURE AND FUNCTION

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ABSTRACT
The objective of the chapter is to clarify the nature and role of states of consciousness. The major tools are the constructs of consciousness, cognition and meaning and their interrelations. After clarifying the relations of consciousness with awareness and cognition, meaning is presented as the understructure of cognition. The next section deals with meaning – its definition, the meaning variables, its properties, its assessment, and the manifestations of meaning in the domains of cognition, personality and emotions. The following part is devoted to states of consciousness: their description, definition, properties, causes, their dependence on meaning-based relations, and their evocation as a function of enhancing the role of specific meaning variables. The potential contribution of states of consciousness for deepening an extending the control of action and experiencing of human beings are described.

Keywords: states of consciousness, awareness, cognition, meaning, focalization.

1. CONSCIOUSNESS AND AWARENESS

Human beings seem to have been always aware of consciousness and have wondered what it is, what it does, who has it, and what are its effects. Part of the difficulty to understand consciousness may be grounded in the fact that examining it requires using it. Another reason may be the multiple aspects that it has, from the points of view of psychology, sociology, and physiology – to mention just a few – which may be difficult to integrate. A convenient starting point is focusing on the aspect that is most prominent in the different definitions and approaches to consciousness. Even a cursory glance at synonyms of consciousness shows that the majority refer to cognitive processes or acts, such as apprehension, awareness, cognizance, realization, attention, alertness or cognizance.

Hence, it is not surprising that many of the more formal definitions of consciousness are affiliated with awareness, which is a prime manifestation of cognition (Dennett, 1996). Both the Merrian Webster dictionary and the Oxford dictionary define consciousness as the state of being aware of something. This conception has been adopted by prominent European philosophers, including Locke and Descartes, and has been elaborated and promoted by Freud (1981) and the psychodynamic approach to psychology, that has been generally accepted.

According to this prevalent and popular conception consciousness is considered as defined in terms of a perpendicular continuum, in which the upper end represents ordinary consciousness, with its highly valued features of awareness, manifested also as clarity, logical thinking, reason, control of drives, emotional regulation, realism and volition. The lower end represents unconsciousness, the location or state in which repressed contents, mostly of sexual or aggressive nature (Freud, 1981), or archetypal themes (Jung, 1964)

exist. In between the two poles there is the preconscious, which is the reservoir of the material that is accessible to voluntary recall but usually exists outside consciousness. Thus, while the top level characterizes consciousness with awareness and the low level characterizes unconsciousness with barred awareness due to repressions, the middle level characterizes preconsciousness with latent awareness (Freud, 1915). The tripartite structure is related also to the major personality factors. Thus, the ego is placed both in the top and medium levels, the superego in all three levels and the id only in the level of unconsciousness (Freud, 1981).

2. WHAT ABOUT THE STATES OF CONSCIOUSNESS?

States of consciousness are related to consciousness at least by their name, but it remains unclear where they belong, how they arise, and where they should or could be placed along the perpendicular axis of consciousness. In addition, it is customary to refer to the 'states' in the plural (e.g., Ludwig, 1966; Tart, 1978), but there has been no clear evidence that these are actually states of consciousness that differ from each other in major characteristics.

The literature about state of consciousness describes different kinds of states. The major distinctions between them are drawn in terms of the stimuli or triggers responsible for their evocation. The main ones are (a) physiological changes due to internal and external factors, such as illness, sleep, medications, or dehydration; (b) changes due to the application of psychological practices, such as hypnosis or meditation; and (c) ingestion of psychotropic chemical materials. The changes described as (a) – (b) are usually called states of consciousness while the changes described as (c) are often referred to as altered states of consciousness (see below States of consciousness: Kinds). However, the differences between the two kinds are neither sharp nor clear. Other related questions that need clarification concern the relation of all the described changes to consciousness and how many different states there are.

Examining the known states of consciousness reveals major differences between them for example in terms of features of illusions, irrationality, hallucinatory tendencies (Fischer, 1978; Tart, 1978) as well as the following characteristics: Salience and status of the self; sense of control and ability to control; clarity of thought; precision of perception in regard to external reality and environment; precision of perception in regard to internal reality and environment; emotional involvement; arousal; kind of cognitive processes activated; accessibility and inhibition of certain kinds of information (Kreitler, 2009). The differences between the states of consciousness and the variations in consciousness they evidence do not justify theoretically and methodologically lumping all of them indiscriminately into the "unconscious".

3. THE RELATIONS BETWEEN CONSCIOUSNESS AND COGNITION

Analyzing and characterizing the differences between the states of consciousness requires placing them in some kind of context. Cognition appears to be an adequate context, at least as a starting point. Why cognition?

Scanning the presented list of states of consciousness, even though it is likely to be partial, raises the question of what kind of system in the living organism could be responsible for such a diversity of effects. Cognition seems to be the only one system that could be considered as a candidate for this role. At least at present, on the psychological

level, cognition is the only structure that has been shown capable as a single system to promote, generate, enable and affect phenomena in all the named domains, ranging from perception to behavior, including all the involved cognitive processes, emotions, and personality traits.

Hence, it is not surprising that there is a rich literature reflecting the close relations that have been noted between consciousness and cognition. Some investigators have defined consciousness explicitly in cognitive terms, such as informational accessibility (Baars, 1988), attention (Graziano, 2020), or self-awareness (Nunn, 1996); or as the result of cognition, for example, high level processing in perception or language (Mandler, 1984); or as the object of specific cognitions, such as emotions, dreams, and intentional states (Flanagan, 1992); or by mean of its functions in regard to cognition, such as identifying inputs, learning, elaborating, recruiting contents for activating a goal, retrieving material from memory, decision making, analogy formation between new and stored contents, reflecting upon our own functioning, and providing the self-system information to use in its task of maintaining stability in the face of changing conditions (Baars, 1988, Chapter 10).

4. MEANING AS THE UNDERSTRUCTURE OF COGNITION

The above examples show that consciousness and cognition are related. But they leave us wondering about how this relationship takes place and what it means about the nature of each of these basic constructs. A large body of studies supports the suggestion that meaning is the construct that is likely to provide the missing link. The suggested hypothesis is that meaning is the system that provides the raw material of which the processes and contents of cognition are made.

Why meaning? There are several reasons for this claim. One reason is the contents of meaning. It includes all contents that play a role in cognition. Secondly, the contents of meaning are not only static but are manifested also as processes. Thirdly, it is not bound exclusively to the verbal mode of expression. Fourth, the use of meaning is flexible and adaptable to a variety of applications. Fifth, there is a large body of studies that shows its contribution to cognition and close involvement in the functioning of cognition. Sixth, meaning is elated also to personality, attitudes, emotions that also affect cognition (see below ***the manifestations of meaning in cognition, personality and emotions***).

The relations between meaning and cognition could be described as similar to the relations between chemistry and physics on the one hand and physiology on the other hand. While chemistry and physics can be applied for representing the material and processes of physiology, it is evident that physiology functions according to rules and formats that are physiological rather than those characteristic of chemistry and physic. Similarly, meaning may be used for representing the materials and processes of cognition, but cognition functions according to rules and formats that are purely cognitive and cannot be derived from the rules that characterize meaning.

Meaning provides the contents and processes for the implementation of the acts and operations on the level of cognition. Hence, meaning can be viewed as the infrastructure of cognition, whereas cognition can be viewed as the level on which meaning becomes manifest and activated. The activation is made possible through the materials provided by the meaning system, but it reflects the dynamics of cognition rather than of meaning (Kreitler, 2009, 2017).

This hypothesis is expected to shed light also on the relation of consciousness to cognition and on the nature of states of consciousness.

5. WHAT IS MEANING?

5.1. The Basic Assumptions and the Data

The definition of meaning in the framework of the meaning system has been reached by means of empirical studies, based on the following assumptions. First, meaning is communicable because most of the meanings we know and use have been learned from others, while there may be also genetically hereditarily transmitted and self-constructed meanings. Second, meaning includes an interpersonally-shared part which plays a major role in communication, and a personal-subjective part which is used mainly for expressing personal private meanings. Third, meaning may be expressed in a great variety of means and forms, both verbally and through non-verbal means, such as movements, drawings and images. Fourth, meaning is a complex multi-dimensional or multi-layered construct because it develops over long periods of time, often irregularly in a cumulative manner under the impact of diverse not necessarily compatible forces (Kreitler, 2022a, Chapters 2 &3; 2022b, Chapters 1&2).

These assumptions have enabled constructing methods for collecting and coding data in regard to meaning that have led to a new definition of meaning and a new methodology for its assessment. The data consisted of responses of several thousands of subjects differing in age (2 to over 90 years), gender, education and cultural background who were requested to communicate the interpersonally-shared and personal meanings of a great variety of verbal and non-verbal stimuli, using any means of expression they considered adequate. Analysis of the meaning communications showed that they presented a rich variety of contents in a great variety of forms, organized in terms of semantic molecules, each of which included two units of contents, one in need of meaning, which we called "the referent" the other called "meaning value" providing the meaning, which was organized and conceptualized in terms of five sets of meaning variables.

5.2. The Definition of Meaning

On the basis of the empirical results and theoretical considerations, meaning was defined as a referent-centered pattern of meaning values. The referent is the input, the carrier of meaning, which can be anything, such as a word, an object, a situation, an event, or even a whole period, whereas meaning values are cognitive contents assigned to the referent for the purpose of expressing or communicating its meaning. For example, if the referent is 'Computer', responses such as 'a machine' or 'can be programmed' or 'includes a keyboard' are three different meaning values. The referent and the meaning value together form a meaning unit (e.g., Computer – a machine). The specific functions of the components of the meaning unit may however change. A cognitive content may be a referent in one meaning unit and a meaning value in another, for example, Computer – has a keyboard; A keyboard – is a part of a computer.

The presented definition underscores the fact that meaning consists of cognitive contents, structured in a specific manner and fulfilling a specific function. The contents express different aspects of meanings; the structuring is expressed in different forms, such as direct or comparative, positive or negative; the specific function is expressing or communicating meaning.

5.3. The Sets of Meaning Variables

The five described sets of meaning variables characterize the cognitive contents in the meaning unit in terms of their contents, structural features and expressive mode.

(a) *Meaning Dimensions*, characterize the contents of the meaning values from the viewpoint of the specific information communicated about the referent, such as the referent's Sensory Qualities (e.g., Roses – red), Locational Qualities (e.g., Paris – in France), Range of Inclusion (e.g., Body - the head, and arms); (b) *Types of Relation*, characterize the immediacy of the relation between the referent and the cognitive contents, for example, attributive (e.g., Summer - warm), comparative (e.g., Spring - warmer than winter), exemplifying instance (e.g., Country - the U.S.); (c) *Forms of Relation*, characterize the formal relation between the referent and the cognitive contents, in terms of its validity (positive or negative; e.g., Car - is not a bicycle), quantification (absolute or partial; Apple - sometimes green), and status (factual, desired or desirable; Law - should be obeyed); (d) *Referent Shifts*, characterize the relation between the referent and the previous referent, for example, the referent may be identical to the former one, its opposite, a part of it or unrelated (e.g., Night – may be replaced by day, or midnight or window); (e) *Forms of Expression*, characterize the forms of expression of the meaning units (e.g., verbal, denotation, graphic) and its directness (e.g., actual gesture or verbal description of gesture). In addition, *Meta-Meaning variables*, characterize the attitude toward the meaning communication that has been assumed by the respondent or is indicated for the recipients (e.g., it is incomplete, it is a quotation, it is a metaphor). (Table 1 presents the full list of meaning variables a-e).

Table 1.
Major Variables of the Meaning System: The Meaning Variables.

MEANING DIMENSIONS[d]		FORMS OF RELATION	
Dim. 1	Contextual Allocation	FR	1 Propositional (1a: Positive; 1b: Negative)
Dim. 2	Range of Inclusion (2a: Sub-classes; 2b: Parts)	FR	2 Partial (2a: Positive; 2b: Negative)
Dim. 3	Function, Purpose & Role	FR	3 Universal (3a: Positive; 3b: Negative)
Dim. 4	Actions & Potentialities for Actions (4a: by referent; 4b: to referent)	FR	4 Conjunctive (4a: Positive; 4b: Negative)
Dim. 5	Manner of Occurrence & Operation	FR	5 Disjunctive (5a: Positive; 5b: Negative)
Dim. 6	Antecedents & Causes	FR	6 Normative (6a: Positive; 6b: Negative)
Dim. 7	Consequences & Results	FR	7 Questioning (7a: Positive; 7b: Negative)
Dim. 8	Domain of Application (8a: as subject; 8b: as object)	FR	8 Desired, wished (8a: Positive; 8b: Negative)
Dim. 9	Material	SHIFTS IN REFERENT[b]	
Dim. 10	Structure	SR	1 Identical
Dim. 11	State & Possible change in it	SR	2 Opposite
Dim. 12	Weight & Mass	SR	3 Partial
Dim. 13	Size & Dimensionality	SR	4 Modified by addition
Dim. 14	Quantity & Mass	SR	5 Previous meaning value
Dim. 15	Locational Qualities	SR	6 Association
Dim. 16	Temporal Qualities	SR	7 Unrelated
Dim. 17	Possessions (17a) & Belongingness (17b)	SR	8 Verbal label

Dim.	18 Development	SR	9 Grammatical variation
Dim.	19 Sensory Qualities[c] (19a: of referent; 19b: by referent)	SR	10 Previous meaning values combined
Dim.	20 Feelings & Emotions (20a: evoked by referent; 20b: felt by referent)	SR	11 Superordinate
Dim.	21 Judgments & Evaluations (21a: about referent; 21b: by referent)	SR	12 Synonym (12a: in original language; 12b: translated in another language; 12c: label in another medium; 12d a different formulation for the same referent on the same level)
Dim.	22 Cognitive Qualities (22a: evoked by referent; 22b: of referent)	SR	13 Replacement by implicit meaning value
TYPES OF RELATION[a]		FORMS OF EXPRESSION	
TR 1	Attributive (1a: Qualities to substance; 1b: Actions to agent)	FE	1 Verbal (1a: Actual enactment; 1b: Verbally described; 1c: Using available materials)
TR 2	Comparative (2a: Similarity; 2b: Difference; 2c: Complementariness; 2d: Relationality	FE	2 Graphic (2a: Actual enactment; 2b: Verbally described; 2c: Using available materials)
TR 3	Exemplifying-Illustrative (3a: Exemplifying instance; 3b: Exemplifying situation; 3c: Exemplifying scene)	FE	3 Motoric (3a: Actual enactment; 3b: Verbally described; 3c: Using available materials)
TR 4	Metaphoric-Symbolic (4a: Interpretation; 4b: Conventional metaphor; 4c: Original metaphor; 4d: Symbol)	FE	4 Sounds & Tones (4a: Actual enactment; 4b: Verbally described; 4c: Using available materials)
		FE	5 Sensory (5a: Actual enactment; 5b: Verbally described; 5c: Using available materials)
		FE	6 Denotative (6a: Actual enactment; 6b: Verbally described; 6c: Using available materials)

		FE	7 Visual media (7a: Actual enactment; 7b: Verbally described; 7c: Using available materials)

Note. The table does not include the meta-meaning variables.

[a] Modes of meaning: Lexical mode: TR1+TR2; Personal mode: TR3+TR4

[b] Close SR: 1+3+9+12 Medium SR: 2+4+5+10+11 Distant SR: 6+7+8+13

[c] This meaning dimension includes a listing of subcategories of the different senses/sensations: [for special purposes they may also be grouped into "external sensations" and "internal sensations"] e.g., color, form, taste, sound, smell, pain, humidity and various internal sensations.

Together the five sets of variables constitute the system of meaning. The list of variables is comprehensive in the sense that it includes many of the variables proposed by other investigators for the assessment of meaning, definitions of meaning and different kinds of meaning in the framework of various disciplines (Kreitler, 2014). These observations may serve as support for the theoretical validity of the meaning system, particularly since the system of meaning was constructed on the basis of an autonomous innovative theoretical and empirical approach rather than by an eclectic method.

5.4. Properties of Meaning as a System

As a system, meaning is characterized in terms of certain properties which play a role in regard to its interaction with other systems in the organism.

(a) Meaning is *an operational-active system*: Its special characteristics become manifest when the meaning assignment process is put into operation.

(b) Meaning is *a complex system*: It consists of a multiplicity of aspects and levels, including five sets of different meaning variables, representing more general or more specific contents, and different clustering possibilities.

(c) Meaning is *an open system*: It interacts with other systems in the organism (e.g., behavior, emotions, cognition), getting inputs from them and providing various outputs to them.

(d) Meaning is *a developing system*: It undergoes development and enrichment through its activation, by acquiring new constituents and new forms of activity, such as new meaning variables, new differentiations within meaning variables, new meaning values within the meaning variables, as well as new expressive modalities that produce new meaning values, new connections among constituents, new organizations of the whole system, and new schemes for meaning generation.

(e) Meaning is *a regressive system*: Its elements may be defined in terms of its other elements that belong to the system.

(f) Meaning is *a self-embedded system*: Each of its parts can act as an anchor point around which the rest of the system is organized, so that its structure is self-enfolding. This implies that the meaning system has a flexible organization that may assume different formats, and that it can be accessed from each of its constituent elements.

(g) Meaning is *a selective system*: It becomes manifest structurally and functionally, often partially, under the impact of selective principles or constraints, some more stable (e.g., culture, family background, personality dispositions, or profession) while others depend on the input and the context, all of which are responsible for the salience or weakness of some meaning variables.

(h) Meaning is a system capable of assuming *different functional formats*: It may appear both in static and dynamic forms. The same variables may be considered in a static format as representing or describing contents or in a different context as representing processes.

(i) Meaning is *a dynamic system*: It may undergo structural-organizational changes which may have functional implications, and are due to internal dynamics or external factors.

5.5. Assessment of Meaning

Meaning assessment consists in analyzing the given materials in terms of the meaning system, regardless of their source, original format, and mode of expression. In assessing meaning the material is first reduced to meaning units, each of which consists of a referent and a meaning value. Then each unit is characterized in terms of the meaning variables defined in the meaning system, namely, it is coded on one meaning dimension, one type of relation, one form of relation, one referent shift and one form of expression. For example, when the referent is "Airplane" and the meaning value is "has a motor", the coding on Meaning Dimensions is range of inclusion, on Types of Relation – attributive, on Forms of Relation - positive, on Referent Shifts - identical to input, and on Forms of Expression - verbal. Summing the codings in each set of meaning variables across all meaning units in the given meaning statement yields a summary representing the frequencies with which each meaning variable has been applied in that meaning statement, which may be a story, a letter, an email, or an art product (Kreitler, 2010).

The initial summaries refer to each of the sets of meaning variables separately, e.g., a summary of frequencies for meaning dimensions and for referent shifts, all of which have identical totals. In addition, there is the overall summary which includes all the meaning variables from the different sets that have appeared in the coding across all the meaning units of the specific meaning statement. The overall summary of frequencies of meaning variables in the given statement of meaning may be called the ‘meaning profile’ of that statement. When the meaning communication has been given in response to the standard set of stimuli of 11 words that constitute the Meaning Test (e.g., street, bicycle), the coding of the meanings produced in this manner yields the individual’s meaning profile. When the meaning profile is based on means of responses given by a group, characterized in some manner (e.g., gender, age, culture, profession) the meaning profile represents the group’s meaning profile (Kreitler, 2022a, Chapters 2 & 3).

6. THE MANIFESTATIONS OF MEANING IN COGNITION, PERSONALITY AND EMOTIONS

Meaning is a major player in the large arenas of cognition, personality, emotions, as well as culture, society, communication, education, health, and art (Kreitler, 2022a, 2022b). A large body of studies showed that there are correspondences between the meaning profiles of individuals and performance in a great variety of domains. In the present context examples will be provided in regard to manifestations of meaning in cognition, personality and emotions.

6.1. The Manifestations of Meaning in the Cognitive Domain

There is a lot of evidence that meaning variables used by an individual in regard to some situation or issue correspond to those that appear in one's meaning profile. For example, if the meaning profile of an individual includes metaphors, it is likely that that individual would use metaphors in one's communications and thinking. Similarly, when the meaning profile includes a meaning dimension like temporal qualities, that individual may be expected to notice more readily perceptual cues relevant for time, recall better items referring to time, have more associations referring to time, and reach faster solutions to problems involving temporal aspects (Arnon & Kreitler, 1984). The same principle of correspondence exists not only in regard to single meaning variables but in regard to whole meaning profiles of tasks.

Determining the meaning profile of a task is based on administering in a study the meaning test and some cognitive tasks to a group of subjects. Comparing the meaning profiles of the subjects who do well on that cognitive task with the meaning profiles of those who do poorly on it provides a list of meaning variables that differ significantly between the two groups. Some of the meaning variables are related to the task positively and some may be related to it negatively. The result is the meaning profile of the specific cognitive task that was used in the study.

Specific meaning profiles of tasks were identified by the described procedure. for example, for spatial navigation, art evaluation, curiosity, planning, creativity, cognitive conservation, problem solving, posing questions, memory, planning, learning to read, learning higher mathematics, interest and intuition (Casakin & Kreitler, 2011; Kreitler, 2022a, Chapter 10; Kreitler & Benbenishty, 2020; Weissler, 1993).

For example, the meaning profile of planning includes the meaning dimensions of action, function, temporal qualities, results, and manner of performance; and the relational variables either or, and both a and b. The meaning profile of creativity includes for example the variables that support the interpersonal mode of meaning (e.g., attributive and comparative types of relation) and the personal-subjective mode of meaning (i.e., the metaphoric-symbolic and the exemplifying-illustrative types of relation) (Kreitler & Kreitler, 1987a).

Meaning profiles for tasks are specific to the tasks to which they correspond. In the case of similar tasks, the meaning profiles may be similar. Thus, the meaning profile of curiosity corresponded to over 10 different tasks assessing curiosity (Kreitler & Kreitler, 1994). Similarly, the meaning profile for problem solving corresponds to some degree to tasks of different kinds of problem solving, such as puzzles, strategic problem solving, or problem solving of formal and logical problems (Kreitler & Kreitler, 1987a; Kreitler, 2022a, Chapter 10).

Thus, having identified a meaning profile of a cognitive act has several applications. First, it provides information about the cognitive processes underlying the cognitive act and supporting it. This enables predicting on the basis of the meaning profile alone whether an individual will be able to perform the cognitive act. The prediction requires comparing the meaning profile of the individual subject with the meaning profile of the cognitive task. The higher the degree of similarity or overlap between the two profiles, the higher the likelihood that the individual would perform well on the task.

Comparing the two meaning profiles also enables identifying the differences, i.e., specifying which meaning variables are included in the meaning profile of the act and are missing in the individual's meaning profile. The missing ones can be trained in a systematic manner so that the individual improves one's ability to perform the task (Kreitler, 2022c).

6.2. The Manifestations of Meaning in the Domain of Personality

It is expected that personality traits will correspond to meaning profiles, first because there are traits in the cognitive domain itself such as creativity, curiosity, imaginativeness and interest in novelty; an secondly, because cognition is a necessary even though insufficient component of common personality traits, such as conformity that requires the grasping of commonalities in behavior of others, or conscientiousness that requires cognition for organizing one's behavior considering accepted standards.

A great number of studies were performed for exploring the interrelations of the meaning system with personality traits. The procedure consisted of administering to the same group of subjects the Meaning Test and one or more standard measures of some personality trait. The meaning variables that differentiated significantly between the high and low scorers on the personality measure or measures of that specific trait were considered as constituting the meaning profile of that personality trait.

A body of research has shown that each of over 300 personality traits was correlated with a specific set of meaning variables (Kreitler, 2022a, Chapter 11; Kreitler & Kreitler, 1990). For example, the meaning profile of extraversion (as assessed by Eysenck's MPI and other measures) included the meaning dimensions sensory qualities of the external environment, actions, quantity and possessions, evoked emotions in others, and shifts in attention to different referents but avoidance of the sensory qualities in regard to one's body, consequences and results, judgments and evaluations and metaphors. This meaning profile reflects the focusing on reality and action while withdrawing from the internal environment that have been found in regard to extraversion by a great number of studies (Kreitler & Kreitler, 1990, pp. 136-143).

Meaning profiles have been identified also in regard to personality charateristics and dispositions other than traits, such as typologies (authoritarianism, anality), defense mechanisms, quality of life, meaningfulness of life, and value orientations (Kreitler, 2011a; Kreitler & Kreitler, 1993, 1997).

The meaning profiles of so many personality traits enabled specifying the features specific for the pattern of meaning variables corresponding to traits. This pattern was used for identifying other meaning profiles as representing traits or not and also enabled validating traits in systematic manner (Kreitler & Kreitler, 1990, 1997) in addition to deepening the insight into the dynamics of traits (Kreitler, 2022a, Chapter 11).

6.3. The Manifestations of Meaning in the Domain of Emotions

The assumption that has inspired the investigation of the meaning profiles of emotions was that the meaning system provides the cognitive foundations for emotions, namely, the cognitive raw materials and processes that are involved in the elicitation, selection and implementation of emotions. For example, a study that dealt with anxiety showed that correlations between the individuals' meaning profiles and scores on seven anxiety scales defined a pattern of meaning variables corresponding to anxiety, with specific features, different from those characterizing the patterns corresponding to personality traits (Kreitler & Kreitler, 1985). The pattern included, for example, low scores on the meaning dimension of action and high scores on the dimension of judgments and evaluations, state, cognitive qualities and the type of relation of metaphor. Another study showed that changing by a training procedure the frequency of the use of the meaning variables in the pattern of anxiety produced predicted changes in the individuals' state anxiety and in their performance on a logical problem solving task (Kreitler & Kreitler, 1987b). Patterns of meaning variables corresponding to fear (Kreitler, 2003), and to anger have also been identified (Kreitler, 2011b), as well as depression, happiness and joy, flow, peace of mind, empathy, humor and alexithymia (Kreitler, 2022a, Chapter. 12) and stress (Kreitler, 2022b, Chapter 4).

6.4. Meaning and Consciousness

Let us now consider and clarify the interrelations between the following major constructs: cognition, meaning and consciousness

The findings reported above are based on the interactive network in which cognition, meaning and the different particular examined kinds of activity are involved. The basic assumption is that meaning provides the contents and processes which are applied in the framework of cognition for the performance of the intended act which may be anything, e.g., cognitive, personality disposition, an emotion (see ***Meaning as the understructure of cognition***). A major implication of this situation is that what occurs with the involvement of cognition is determined to some extent by the inputs flowing in from the meaning level, or in other words, that which cognition can perform depends on what meaning makes possible to perform. However, the necessary materials may not always be accessible or available. The accessibility and availability of contents and processes enabling cognitive activities depend also on the state and dynamics of the meaning system (Kreitler, 2016).

As described above, meaning is a dynamic and active system. At any point in time the system of meaning is in a particular organizational-structural state. This state is defined in terms of the kind and number of meaning variables that are in a focal position and salient at the time, namely, they have an organizational primacy and a functional advantage for elicitation and involvement in different cognitive activities, whereas the other meaning variables are in the background in different states of inactivation (Kreitler, 1999, 2002, 2009; Rotstein, Maimon, & Kreitler, 2013). This assumption is similar by analogy to the tenet that each physical system is characterized at any point in time by a certain degree of temperature which determines for example the rate and extent of physical reactions that take place. Judging by its effects, the state of the cognitive system at any given point in time is what we could call consciousness.

Accordingly, consciousness is considered as the property reflecting the global state of cognition at any given time, in terms of the contents and processes that are potentially available at this given time. The potential availability of the contents a process depends upon the organizational structure of the underlying meaning system. The organizational state of the meaning system is the major determinant of what is called consciousness in regard to cognition at any given time (Kreitler, 1999, 2009, 2012a).

7. STATES OF CONSCIOUSNESS

7.1. States of Consciousness: Definition

Consciousness is in principle a dynamic quality submitted to changes. The changes are reflected on the cognitive level in terms of the prominence and availability of specific contents and processes. The changes are called states of consciousness. The changes represent formally changes in cognition, that are a function of variations in consciousness (Kreitler, 2018a).

7.2. States of Consciousness: Properties

States of consciousness are the changes in cognition that are a function of variations in consciousness. The changes vary in *extent*. Some of the changes are limited in extent, and involve basically the setting of several meaning variables in a focal position of dominance for a given period of time, required for supporting a certain action. Changes of this kind involve what may be called focalization. Other changes may involve large parts of

cognition, and may affect also emotions, personality traits, the perception of reality, the sense of self and behavior, as well as physiological manifestations, such as heart rate.

The changes that correspond to states of consciousness vary in *duration*. Some are brief, lasing seconds or hours, while some last for longer periods (Kreitler, 2006).

The changes vary in their *experiential effects*. The meaning system is mostly in a state that enables it to support all ongoing cognitive activities and adjust to the required changes. This is due, on the one hand, to the stability of the meaning system and, on the other hand, to the similarity in the type of the cognitive tasks in which one is engaged. Therefore, it is mostly unnecessary to consider the consciousness of the cognitive system or become aware of the contributions of the meaning at a particular point in time. Hence, the changes underlying the states of consciousness may be attended by more or less noticeable experiential effects. The latter depend largely on awareness on the part of the individual but not exclusively. Some of the changes are attended by awareness on the part of the individual, while some are not. Awareness may depend on the extent of the changes and the deviation of their effects from the habitual. Some of the changes may be noted by the individuals when they occur but others may be noted only post-factum (e.g., the state of consciousness in sleep or in anesthesia). Some states of consciousness may be noted or experienced by the individuals themselves while others may be noted or identified by eternal observers (e.g., the state of consciousness of intoxication by some drug).

7.3. States of Consciousness: Causes and Antecedents

There are several sets of reasons for changes manifested as states of consciousness. They differ in their origin, extent, and effects.

(a) One major set of reasons is due to the dynamics of the meaning system itself or in response to the needs of the organism in view of externally-induced changes, such as confronting new tasks and massive amounts of new information for example, reorganizing when a mass of new contents has become available, developing structural complexity, complementing a rudimentary or fragmentary view of reality, adjusting to a new set of cognitive tasks due to cultural changes (e.g., migration) or change of occupation (e.g., working place, profession) (Kreitler, 1999; 2022d). These requirements may be dealt with on the functional level without requiring changes in the structure of the cognitive system. But in some cases the change may be so large or critical in terms of amount and significance that it may require structural changes in the cognitive system, such as defining new meaning variables or new clusters of existing meaning variables or new organizations that may be identified as evolutionary changes (Kreitler, 2002; Maimon & Kreitler, 2013).

(b) The set of reasons based on the normal circadian cycle of sleep and wakefulness, with the different regular variations in depth of sleep, dreaming, and high levels of clarity in full wakefulness.

(c) A third set is of a psychological nature. It includes the reasons representing the effects of special emotional and cognitive states of 'going beyond oneself ', such as flow, insight, oceanic feeling, inspiration, or creativity. This set may include also emotional states like ecstasy, and love.

(d) Another set of reasons is due to temporary physiological effects, related to pathological states (e.g., fever, intoxication, temporary neurological conditions, fainting, reduced blood pressure), psychological shock, or external conditions that may affect physiological functioning, such as reduced sensory stimuli, reduced oxygen supply, sleep deprivation, starvation, and extreme temperatures.

(e) A fifth set of reasons is due to the ingestion of drugs mostly for medical objectives, such as drugs intended for treatment of different diseases (e.g., cardiological,

cancer), anesthesia for surgery, for induction of sleep, for relaxation, barbiturates, or analgesics for the reduction of pain.

(f) A sixth set of reasons is due to the medical factor. It is based on cognitive changes attending different diseases or disease states, related for example to neurological diseases or diseases affecting neurological aspects, coronary heart disease (e.g., heart failure), or cancer, diabetes (e.g., fainting, diabetes shock), toxic effects, epilepsy, accidents involving the brain, high fever, infections, or epilepsy (Kreitler, Weissler & Barak, 2013).

(g) A seventh set of reasons is due to psychopathological diseases or states, such as depression, euphoria, anxiety, schizophrenia, psychotic attacks, and other mental disorders as well as mystical experiences and possibly near-death experiences.

(h) An eighth set of reasons is due to ingesting chemical or other substances applied for evoking special experiences, such as psychoactive drugs, alcohol, stimulants, opioids, psychedelics, dissociatives, delirants, LSD, methamphetamines, ecstasy MDMA, opiates etc. Some of the evoked effects are attended by pleasurable experience, some are invigorating, some have sympathomimetic effects, while others are stimulants.

(i) A ninth set of reasons represents different techniques that have been used in different cultures for hundreds of years for inducing experiences attended by changes in consciousness, such as specific bodily postures, repetitive movements, monotonous singing tones, repetition of specific words or syllables, music, dancing, meditation, guided imagery, shamanistic practices etc. (Kreitler, 2012b).

The list of sets of reasons for changes in consciousness responsible for a great number of identified and potential states of consciousness suggests that states of consciousness are an habitual kind of experience for a great number of individuals who may be expected to be familiar with them or at least some of them to different degrees.

7.4. States of Consciousness: Meaning-Based Relations

An important venue for understanding the nature of states of consciousness and for their generation is based on analyzing the states of consciousness in terms of meaning changes.

There are no specific limits in regard to the potential possible changes in the meaning system. Consciousness is a constant feature of cognition, because cognition is always in a specific state. However, there may be different states of consciousness, due to different organizational transformations in meaning. In each state different cognitive contents and processes are available and others that are not available to the same extent. The availability of the contents and processes determines what kind of cognitive acts can be performed on better or poorer levels.

As noted, the changes in consciousness are a function of changes in meaning. Many if not most of the changes in meaning affect the cognitive system and are reflected in it even if cognition is not the major origin of the causes for the changes ut rather physiological changes or external factors (see ***States of consciousness: Causes and antecedents)***.

A great number of studies showed that specific meaning variables are related to specific cognitive acts, supporting the performance of these acts (see ***The manifestations of meaning in the cognitive domain;*** Kreitler, 2022a, chapter 10). However, in order to clarify the role of meaning variables of this kind in regard to states of consciousness it is necessary to clarify the following two issues. First, is it possible to promote specific meaning variables at least temporarily into a focal position in cognition so that they will be applied in performing the intended cognitive acts? Second, in case the promotion of specific meaning variables into a focal position is possible, does it involve a change in consciousness experienced by the individual?

8. FOCALIZATION OF MEANING VARIABLES

The process whereby specific meaning variables are promoted into a focal position constitutes a part of the procedure of training meaning (Kreitler, 2022a, Chapter 13). It is called focalization. The major principles are selecting specific meaning variables, performing the training in regard to each meaning variable separately, basing the training on the active involvement of the trainee. Selecting the meaning variables for a specific training session may be done by examining which meaning variables differentiate significantly between the meaning profiles of subjects who do well on the specific task and those who do not do well on it (Kreitler, 2022c).

The main steps of the training itself are increasing the number of meaning values relating to the specific meaning variable by eliciting meaning values in the desired meaning variable, for example, by using adequate stimuli (e.g., verbal, visual, musical); elaborating the meaning of the meaning variable itself, by assigning to it meanings in term of the different meaning variables in the system of meaning; and applying the trained meaning variable in several cognitive acts, for example, memory, evaluating. Each step is performed in line with standard systematic rules. The training may last from 3 to 10 minutes per meaning variable.

A series of studies was done in order to examine whether it is possible to perform a focalization of specific meaning variables. The promoted meaning variables in the different studies were selected on the basis of previous results of studies about their relation to specific acts. In each case, promoting the meaning variables was accompanied also by administering the cognitive acts of interest, after completing the training of the meaning variables (Kreitler, 1999, 2009, 2013b).

The following studies demonstrate the experimentally achieved results of focalizing specific meaning variables. Three kinds of such studies are described, differing in the extent of the meaning variables involved in the focalization experiment. After each study care was taken to dissipate the effects of the focalization. In regard to each study mentioned in A., B., and C), the psychological effects are specified prior to the citation of the meaning variables that were involved in the focalization.

8.1. A. Examples of Studies in Which Specific Kinds of Meaning Variables Underwent Focalization

Specific kinds refer to meaning variables of one set, such as types of relation or shifts of referent.

(a) Considering complexities and different contextual and circumstantial constraints, and of the impact of situational factors were related to focalizing the complex forms of relation (FR4, FR 5, FR 6, FR 7, FR8, Table 1);

(b) Dynamic-operational thinking, solving fast and well problems involving technical issues and action plans were related to focalizing the meaning dimensions representing dynamic aspects of meaning (mainly functions, action and manner of operation, Dim 3, Dim 4, and Dim 5, Table 1);

(c) Sticking to the facts of reality, good concentration, controlled attention, focusing on the existing or provided information were related to focalizing minimal (close) shifts of referent (SR1, SR3, SR9, SR12, Table 1);

(d) Critical thinking, negating, avoiding were related to focalizing of the negative forms of relation (FR1b, FR2b, FR3b, FR4b, FR5b, FR6b, FR7b, FR8b, Table 1);

(e) Good performance in verbal memory, verbal expression, problem solving of verbally stated problems were related to focalizing the verbal forms of expression (FE1, Table 1);

(f) Good performance with nonverbal materials, creative thinking, metaphorical and symbolic thinking were related to focalizing of the nonverbal forms of expression (FE2, FE3, FE4, FE5, FE6, FE7, Table 1);

(g) The tendencies to "go beyond the information given", shifts of attention, rich associations, creative approach, losing focus were related to focalizing of the distant shifts of referent (SR6, SR7, SR8, SR13, Table 1);

(h) Understanding analogies, constructing comparisons and preferring analogies to other presented forms of presentation were related to focalizing of the comparative types of relation (TR2a, TR2b, Table 1);

(i) Understanding metaphors, generating metaphors, preferring metaphors to other presented forms of presentation were related to focalizing of the metaphoric and symbolic types of relation (TRb, TRc, TRd, Table 1);

(j) Expressing oneself by means of examples of different kinds, preferring illustrative instances to other forms of presentation were related to focalizing of the exemplifying-illustrative types o relation (TR3a, TR3b, TR3c, Table 1).

8.2. B. Examples of Studies in Which Clusters of Meaning Variables Were Submitted to Focalization

Clusters refer to meaning variables of more than one set, for example, types of relation of two kinds (e.g., TR3 and TR4) or forms of relation and meaning dimensions.

(a) ***The personal-subjective and the interpersonally-shared modes of meaning***: Several studies were devoted to promoting the exemplifying-illustrative and metaphoric-symbolic types of relation (TR3, TR4, Table 1) that were conceptualized as supporting the personal-subjective mode of meaning. The results were compared with those in another set of studies that were devoted to promoting the attributive and the comparative types of relation (TR1, TR2, Table 1) that were conceptualized as supporting the interpersonally-shared mode of meaning. The findings showed that focalizing the personal-subjective mode of meaning as compared to focalizing the interpersonally-shared mode of meaning resulted in better performance on visual memory tasks, identifying embedded figures, completing incomplete gestalts, recounting of bizarre experiences, scores of fluency, flexibility and originality in creativity tests, identifying correctly facial emotional expressions and the production of more associations in general and of personal associations in particular, and preferring expressionist and symbolic art to representative or abstract art (Kreitler & Kreitler, 1972, 1983). But on the other hand, the focalization of the personal-subjective mode of meaning resulted in longer reaction time, worse performance on judging the validity of logical syllogisms, lower scores on evaluating and comparing the size of circles and of lines, and of reality testing and emotional control in the Rorschach test (Kreitler, 2013a; Kreitler, Kreitler, & Wanounou, 1988).

(b) ***The concrete and abstract approaches***. Focalization of the concrete approach was attained by promoting five meaning dimensions referring to sensory aspects (i.e., Dim. 19a sensory qualities, Dim. 13 size and dimensions, Dim. 9 material, Dim. 11 state, Dim. 15 locational qualities); the illustrative type of relation (TR3a examples of items, TR3b situations, and TR 3c dynamic scenes); simple forms of relation (Forms of relation FR1, FR3); close shifts of referent (referent shifts 1,3,9,12 as defined in Table 1). Another set of studies dealt with the focalization of meaning variables supporting the abstract approach by promoting the following five meaning dimensions supporting abstract thinking (i.e., Dim. 1

contextual allocation, Dim. 2a subtypes, Dim. 6 causes, Dim. 7 results, Dim. 21a judgments and evaluations); the comparative type of relation (TR 2a similarity, TR 2b difference, TR 2c complementariness); complex forms of relation (FR4 conjunctive, FR5 disjunctive); shifting to distant referents (shifts of referent 6,7,8,13 as defined in Table 1). The findings showed that focalizing the meaning variables supporting the concrete approach concrete as compared to focalizing the meaning variables supporting the abstract approach resulted in made more mistakes in switching on the sorting test, lower scores on the logical reasoning test, provision of fewer general labels for photos, and better scores for memory of visually presented items and in describing oneself in terms of references to actional-dynamic and sensory aspects (Kreitler, 2017).

8.3. C. Examples of Studies in Which Meaning Variables Corresponding to Personality Tendencies Were Submitted to Focalization

The following examples refer to focalization of meaning variables forming specific meaning profiles corresponding to specific personality tendencies. One study was devoted to focalizing several of the meaning variables supporting *humor* (Kreitler, 2018c). The major meaning variables that underwent focalization included the meaning dimensions contextual allocation, function, manner of operation, structure, who is involved in the situation, what is affected, feelings and emotions, cognitive qualities; both the personal-subjective and the interpersonally-shared modes of meaning; and small shifts of referents (Dim. 1, Dim. 3, Dim. 5, Dim. 10, Dim. 8a, Dim. 8b, Dim. 20, Dim. 22; TR1+2, TR3+4, SR 1+3+9+12, Table 1).

Another study was devoted to focalizing several of the meaning variables supporting control of empathy (Kreitler, 2018b). The main meaning variables that underwent focalization were the active agents in a situation, cognitions, judgments and evaluations, emotions evoked in oneself or observed in others, sensory qualities, sensory experiences, examples and illustrations, metaphors, declarative statements, positive statements, nonverbal expressions mostly gestural, and inputs close to those presented (Dim. 8a, Dim. 22, Dim. 21, Dim. 20a, Dim. 20b, Dim. 19a, Dim. 19b, TR3, TR4c, TR1a, FR1a+FR2a+FR3a, FE3, SR1+3+9+12, Table 1) (Kreitler, 2018b).

8.4. States of Consciousness and Focalizations

The three types of focalization studies showed that focalization of meaning variables is possible and produces the expected results of the predicted changes in the performance of the cognitive acts. These results enable proceeding into the second above outlined phase, which was examining whether focalization involves a change in consciousness experienced by the individual. This crucial issue was examined by analyzing the responses subjects provided to the following questions included in a questionnaire administered to all subjects following their participation in a focalization study. The questions were: Following the study in which you have participated, did you experience anything unusual or some change (a) in your thinking in general? (b) in the way you looked at things or how things seemed to you? (c) in the way you felt about yourself? The alternative responses were ‘yes’, ‘no’ or ‘not sure’. The questions were administered on a voluntary basis. Support was offered when requested or necessary.

The questionnaire was administered after 9 studies, which included five randomly selected studies of the focalization studies involving specific meaning variables, after the two studies in which the modes of meaning and of concrete and abstract approaches (involving focalization of clusters) and after the study of empathy (involving the focalization of the variables of a meaning profile). The findings were very clear-cut: 61%

of the responses given to any of the three questions (a-c) following the focalization studies of clusters or meaning profiles indicated experiencing some change or something unusual following participation in the study. Further interviewing in some cases showed that the change was relatively weak but noticeable. The reported experiences referred mostly to thinking in general, to perception of reality, to fling oneself, and in some cases to emotions or moods. Notably, in no case no similar responses were given after participating in the focalization studies of specific meaning variables.

The conclusion supported by the reported finding is that focalization of meaning variables may be attended by changes in experiencing that could be considered as representing a potential for states of consciousness. The change in experiencing occurs only after medium or large scale changes in meaning variables and not after changes in a small or minimal number of meaning variables. The reason is probably that changes in a small or minimal number of meaning variables are habitual and individuals have a chance to get accustomed to them so that even when they are detected they do not evoke any particular experience. Notably, a similar observation was made in regard to deviations from reality that were experienced as such mainly when they were of at least a medium or large degree but not when they were small or minimal (Kreitler, 2018a, 2022a, 2022e).

9. SOME GENERAL CONCLUSIONS

The chapter focused on the following three major constructs: meaning, cognition and consciousness. They were discussed from different points of view which highlighted their interrelations, and the resulting interactions. The discussion showed that they form a network in which each serves a particular role and benefits from the reciprocal functioning with the other constructs. Meaning provides the contents and processes for the activities of cognition, whereby consciousness represents the overall state of cognition as powered by the contributions of meaning. All three constructs are in a dynamic state to different degrees, dependent functionally on each other. Cognition deals with the applications, meaning – with the provision of the materials, and consciousness represents the situation as a whole. As such consciousness has the possibility to check which actions are possible, evaluate those that are activated and identify those that may be performed or are required to be performed. As noted, specific actions may benefit from the availability of particular contents and functions of cognition.

The dynamism of these three constructs is reflected on the level of activities and in addition on the level of development. All three constructs are involved not only in changes in the limited arena of functioning but also in transformations in a larger more encompassing sense. Cognition is involved in acquiring new schemes and forms of activity in the cognitive arena proper but also in regard to other domains, including personality traits and dispositions, emotions, attitudes, values, behaviors, and physiology. Meaning is involved in acquiring new meaning values in existing meaning variables, forming new meaning variables and generating new clusters of meaning. Consciousness in its turn is involved in promoting new possibilities of actions in all domains – cognition and others - checking the possibilities, given the limitations of cognition and the potentialities provided by meaning.

This is the point at which states of consciousness acquire a special importance. The states of consciousness are the means that connect consciousness with the individual, allowing him/her to evaluate the possibilities of acting or responding in view of the requirements of the situation, thus enabling the promotion of necessary and possible focalization. States of consciousness become the tool for control by applying awareness.

The possibilities of focalization are in principle unlimited, and are restricted only by knowledge and motivation of the individual. Focalizations may be applied in regard to the evocation and control of positive or negative emotions, stress, flow, creativity, empathy problem-solving, memory, concentration, relaxation, and peace of mind – just to cite a few examples. Having learned the procedure of focalization, one may activate it in order to produce the selected action or state of mind. It is evident that the transformational changes in meaning are a powerful factor with a broad range of effects in human functioning and behavior and well-being. When they are activated in a self-generated manner they are likely to broaden appreciably the level of activity and the freedom of action of human beings.

Acquiring the procedure of self-generated focalizations would constitute a serious progress in the self-control of human beings who could tune themselves to produce the optimal state of consciousness for the task at hand.

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