

The Many Faces of Consciousness

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Abstract

The paper presents a new approach to the definition of consciousness in terms of an innovative theory of meaning (Kreitler & Kreitler). Most of the existing approaches to consciousness assume that differences in consciousness consist mainly in degrees of awareness. However, analyzing states of consciousness reveals that they differ in several major dimensions, e.g., status of the ego or sense of control. The presented approach is cognitive and is based on the theory of meaning which deals with the contents and processes underlying cognitive functioning. The main thesis is that cognition is a meaning-processed and meaning-processing system. Accordingly, it is suggested that states of consciousness are the product of meaning-prompted encompassing organizational transformations of cognition that affect the cognitive system and may result also in changes in other systems, mainly, emotional, personality and behavior. A study with 82 undergraduates is presented in which one group underwent experimental manipulations of meaning variables designed to enhance a concrete mode of approach and another—an abstract mode. They were all administered tasks of sorting, logical reasoning, provision of labels to photos, verbal memory, visual memory and self-image. The results confirmed the hypotheses in regard to most variables except verbal memory. The findings support the assumption that the concrete and abstract modes correspond to states of consciousness.

Keywords

Consciousness, Awareness, Concrete Thinking, Abstract Thinking, Cognition, Meaning, Self-Image, Logic

1. Consciousness and Awareness

There is a great number of definitions of consciousness that differ in almost any conceivable aspect, from theoretical background to experimental implications. However, many of them share the assumption that consciousness is affiliated or equated with awareness (Dennett, 1996). This conception has been supported by

European philosophers including Descartes and Locke, but has been developed and promoted mainly by Freud and the psychodynamically oriented school of psychologists (Freud, 1981).

The supporters of this approach consider consciousness as varying along a perpendicular continuum, in which the upper end is defined as consciousness, representing ordinary consciousness, with its highly valued quality of awareness, enhanced by affiliated terms, such as clarity, logical thinking, reason, control of drives, emotional regulation, realism and volition. The lower end represents unconsciousness, the state in which repressed contents, mostly of sexual or aggressive nature (Freud, 1981), or archetypal themes (Jung, 1981) are kept. The manifestations of this state are all lumped together under the label of low or minimal awareness. Since the term altered states of consciousness has been coined by Ludwig (1966) and adopted by Tart (1975), there has been an unclear tendency to refer to the label altered states of consciousness in the plural. But there has been no clear evidence that these are actually states of consciousness that differ from each other in major characteristics.

2. State or States of Consciousness?

A survey of the rich literature concerning states of consciousness readily reveals that the major distinctions drawn among them are in terms of the external stimuli or triggers responsible for their evocation. These may be classified into three major groups: (a) conditions under which the states characteristically occur (e.g., mental disorders, oxygen deprivation, sleep deprivation, fasting, sensory deprivation, accidents involving the brain, high fever, infections, epilepsy); (b) techniques used for inducing particular states (e.g., meditation, hypnosis, shamanistic practices, music, dancing), and (c) chemical or other substances applied as triggers (e.g., psychoactive drugs, alcohol, stimulants, opioids, psychedelics, dissociatives and delirants).

Identifying trigger conditions provides merely a starting point for characterizing the differences between these conditions. There have been several proposals of dimensions for characterizing consciousness phenomena. One of the best known is the continuum from the outer being to the inner being (Gooch, 1972; Lilly, 1972), which represents the axes of the subjective-objective, the personal-impersonal, the illusory-absolutely true, the material-spiritual, and the temporary-constant. Further examples are the two orthogonal dimensions of irrationality and of the ability to hallucinate (Tart, 1975) and the two dimensions of perception-hallucination and perception-meditation (Fischer, 1978). The most extensive proposal refers to ten parameters based on empirical data representing interviews, surveys and preliminary psychological investigations (Kreitler, 2009): Saliency 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 (kinds of and amount).

The described variables enable characterizing major experiential aspects of at least some of the states of consciousness (Kreitler, 2009). These and similar results, for example, about the emotional effects of certain drugs (Aldridge & Fechner, 2006) imply that what has been referred to as “the unconscious” represents in fact a cluster of different states of consciousness. Overlooking the differences among them is unjustified theoretically and empirically. Studying empirically the differences between the states of consciousness requires analyzing manifestations of the different states by means of experimental procedures. In the present context cognition has been chosen as a starting point.

3. Consciousness, Cognition and Meaning

There is a lot of evidence about the close relations of consciousness with cognition. Cognition has been considered as the antecedent condition for consciousness (Mandler, 1984), as its function (Baars, 1988: chap. 10), or as a factor contributing to cognitive performance (Hardcastle, 1995; Barber, Spanos, & Chaves, 1974). On the basis of these approaches it was assumed that it may be possible to change consciousness by changing specific aspects of cognition. Previous studies fully supported this assumption. The findings showed that specific changes in consciousness were attained by cognitive changes affected by manipulating meaning processes. For example, strengthening meanings involved in personal-subjective meaning were related to changes in scores of the Rorschach test in normal and schizophrenic patients (Kreitler, Kreitler, & Wanounou, 1987-1988). The rationale for these findings was a body of data that showed correspondences between performance in particular cognitive tasks, such as planning or creativity and scores in variables that were identified as reflecting processes constituting meaning assignment, for example, stating the function or structure or sensory features of a stimulus to which meaning is assigned (Kreitler & Casakin, 2009; Kreitler & Kreitler, 1986a; 1990b). These and other variables used in meaning assignment form part of the system of meaning (Kreitler, 2014).

On the basis of a large body of data and empirical studies (Kreitler & Kreitler, 1988, 1990a, 1993; Kreitler, 2013b) meaning was defined as a referent-centered pattern of cognitive contents, whereby referent is the input, the carrier of meaning, which can be a word, an object, a situation, an event, or even a whole period, and meaning values are cognitive contents assigned to the referent for the purpose of expressing or communicating its meaning. The referent and the meaning value together form a meaning unit (e.g., computer-serves communication), which is characterized in terms of five sets of meaning variables referring to the contents, structure, and form or expression of the unit components (Table 1 presents the full list of variables). The five sets constitute the system of meaning which may be applied for characterizing stimuli of different kinds, meaning assignment tendencies of individuals (by means of the Meanings Test), and processes involved in cognitive acts and different personality traits and predispositions (Kreitler & Kreitler, 1985, 1986b, 1990a; Kreitler, 2010, 2012, 2013a).

The role that meaning fulfills in regard to cognition indicates that meaning

Table 1. Major variables of the meaning system: the meaning variables.

<u>MEANING DIMENSIONS</u>		<u>FORMS OF RELATION</u>	
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	<u>SHIFTS IN REFERENT^b</u>	
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
<u>TYPES OF RELATION^a</u>		<u>FORMS OF EXPRESSION</u>	
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)	FE4	Sounds & Tones (4a: Actual enactment; 4b: Verbally described; 4c: Using available materials)
		FE5	Denotative (5a: Actual enactment; 5b: Verbally described; 5c: Using available materials)

Note. The table does not include the meta-meaning variables. ^aModes of meaning: Lexical mode: TR1+TR2; Personal mode: TR3+TR4; ^bClose SR: 1 + 3 + 9 + 12 Medium SR: 2 + 4 + 5 + 10 + 11 Distant SR: 6 + 7 + 8 + 13; ^cThis 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.

functions as the infrastructure of cognition, providing the contents and processes for the performance of cognitive acts and other tasks in which cognition is involved. The close relations between cognition and meaning enable changing the functioning of cognition by changing certain aspects of meaning. The changes of meaning may be limited, as in priming of a specific meaning variable. In other cases they may involve a greater number of meaning variables, which consists in placing specific clusters of meaning variables in focal positions so that they have an organizational primacy and a functional advantage for elicitation and involvement in cognitive activities, while the other meaning variables are in the background in different states of inactivation (Kreitler, 1999, 2001, 2002, 2009; Rotstein, Maimon, & Kreitler, 2013).

We suggest to consider comprehensive changes in cognition, originating in the meaning system, as equivalent to states of consciousness. Accordingly, consciousness is the state of cognition at any given time defined in terms of the organization of the meaning system at that time, whereas any major changes in the state of cognition, brought about by specific changes in meaning, may be considered as different states of consciousness.

Examples of states of consciousness produced experimentally are states dominated by personal-subjective meaning or by interpersonally-shared meaning. The former consists in placing in focal positions the meaning variables representing personal meaning (based on promoting the exemplifying-illustrative and metaphoric-symbolic types of relation), the latter depends on inducing interpersonally-shared meaning (based on promoting the attributive and comparative types of relation). As compared to the induction of the interpersonally-shared meaning mode, the induction of the personal-subjective mode of meaning resulted in better performance on visual memory tasks, identifying embedded figures, recounting of bizarre experiences, creativity tests assessing fluency, flexibility and originality, and the production of more associations; but worse performance on judging the validity of logical syllogisms and reality testing and emotional control in the Rorschach test (Kreitler, 2013a; Kreitler, Kreitler, & Wanounou, 1987-1988).

4. Objectives of the Study

Almost all studies concerning meaning-based effects on cognition have been attained by changing the meaning variables mediating the personal-subjective meanings or the interpersonally-shared meanings. The rationale for this choice was mainly that the cognitive manifestations of these changes were easily identified in different well-known domains of states of consciousness due for example to states of dreaming or drug intoxication. The purpose of the present study is to explore the effects of changes in other parts of the meaning system. The sets of meaning variables on which this study focuses are first, those involved in concrete thinking, and second those involved in formal abstract thinking. These sets were chosen because there are indications for their existence and functioning in different contexts. These two modes of approach have been studied in the con-

text of development, where it was shown that children proceed from the concrete operational stage to the stage of abstract and formal thinking (Piaget, 1954); in the psychopathological context, where concrete thinking was shown to be a characteristic hallmark of schizophrenia (Schwartz, 2014); in cultural anthropology where the tendencies for concrete or abstract thinking have been identified as characteristic features of different cultures (e.g., Holland & Quin, 1987); and in of brain-damaged individuals (Goldstein & Scheerer, 1941). In the present study experimental manipulations of particular meaning variables were undertaken with the purpose of producing in individuals temporarily concrete and abstract states of consciousness and testing their expected manifestations in the performance of cognitive tasks and the self image.

The hypotheses were that the subjects who have undergone an experimental manipulation designed to enhance the concrete mode would differ significantly from those exposed to the manipulation designed to enhance the abstract mode in their scores on the administered following tests: they would score higher on the test of card sorting and visual memory, but lower on the tests of logical reasoning, labels provision, verbal memory and the self-image scale.

5. Method

5.1. Participants

The subjects were 82 undergraduates (41 women, 41 men) in the age range of 23 - 31 years who volunteered to participate for credits in the course of their study.

5.2. Tools

(a) A modified card sorting test, which is a standard measure of abstract reasoning, and of the ability to change problem-solving strategies when required. The test consisted of cards which varied in the presented shape (triangle, circle, square, star), color (blue, red, yellow, green), and number (1, 2, 3, 4). The cards were presented in sets of four which represented some rule (e.g., the cards differed in the presented number of shapes from 1 to 4). The subject's task is to match an additional presented card to the rest by identifying the presented rule. The same rule is presented repeatedly for a random number of times and then is changed without warning. The unexpected change occurred in 15 times out of 50 total exposures. A mistake was defined as following a previous rule the next time after it changed. The score was the number of mistakes, which ranged from 0 to 15. The higher the score the lower is the shifting ability. (b) Logical thinking test. It included 15 logical questions representing classical kinds of problems referring to judging the validity of syllogisms, deduction problems about seating arrangements, and seriation. Following each problem four response alternatives were presented, including only one correct response. The subject was requested to select for each question one out of the four presented answers. The scoring consisted of 1 for a correct solution and 0 for a mistake. The scores ranged from 0 to 15, with the higher score representing higher logical thinking. (c) Description/labelling of photos: Four photos were presented, in random order, for 10

seconds each: two photos presenting arrays of different unorganized items (e.g., words, objects) and two photos presenting an organized view (i.e. a room and a rural landscape). The subject's task was to label the photo after viewing it. The scores were 1 for naming items, 2 for giving a label for part of the photo, 3 for giving a label for part of the photo and listing items, 4 for giving a label for the whole photo and listing items, 5 for giving only a label for the whole. The scores ranged from 4 to 20. The higher score represented higher conceptual thinking;

(d) Verbal Memory task: A pretested list of 30 verbal items was presented on a screen, 2-sec per item. The 30 items were presented again after 3 minutes delay mixed randomly with 20 items that were not presented earlier. The subject's task was to state concerning each item if it had been presented earlier in the list or not. The score was the number of correctly identified items. The score ranged from 0 to 30;

(e) Visual Memory Task: This task was the same as the Verbal Memory task with the difference that the items were drawings of unfamiliar icons;

(f) The meaning-based assessment of self-image (MBAS) (Kreitler, in press): The scale includes 30 items each of which refers to a different meaning dimension, i.e., category of contents about the self. The subject's task was to check concerning each item how adequate it is for describing one's self image (scores 4 for highly adequate to 1 = totally inadequate). Several scores were used in the study: the number of items to which the response was 4 or 3 (i.e., they were considered as highly adequate or adequate for describing the self-image), the scores in two groups of categories: self descriptions in terms of actional-dynamic and sensory aspects (e.g., actions, functions, manner of functioning, size, state, weight), and self-descriptions in experiential and contextual aspects (feelings, thoughts, memory, causes, results of one's existence). The latter two scores (whose range was 0 - 7) refer to items that are included in the MBAS itself.

In sum, the variables defining a concrete mode as compared with an abstract mode were: a higher score in the sorting test, a lower score in the test of logical reasoning, a lower score in the labels test, a lower score in the verbal memory test, a higher score in the visual memory test, a lower total score in the MBAS, a higher score in the actional-dynamic + sensory aspects of the MBAS and a lower score in the experiential + contextual aspects of the MBAS.

5.3. Procedure

The subjects were divided randomly into two groups, each with 41 members. Each group got only one of the following two manipulation procedures, determined randomly. One procedure was designed for promoting the concrete approach and one for promoting the abstract approach. Both were based on training specific sets of meaning variables, selected for each approach on the basis of the results in previous studies (Kreitler, 2012, 2014). The meaning variables trained for the concrete approach were: the five meaning dimensions of sensory qualities, size and dimensions, material, state, locational qualities; the illustrative type of relation (examples of items, situations and dynamic scenes); simple forms of relation (Forms of relation 1,3); close shifts of referent (referent shifts 1, 3, 9, 12 as defined in **Table 1**).

The meaning variables trained for the abstract approach were: the five meaning dimensions of contextual allocation, range of inclusion: Subtypes, causes, results, judgments and evaluations; the comparative type of relation (similarity, difference, complementariness); complex forms of relation (conjunctive, disjunctive); shifting to distant referents (shifts of referent 6, 7, 8, 13 as defined in **Table 1**).

The two procedures were identical in the number and kinds of meaning variables that were promoted but differed in the specific meaning variables. The training procedures were presented on tablets or paper (depending on the subject's choice) and lasted 18 - 20 minutes. The training of each variable consisted of three sequential phases. The first phase was devoted to extending the range of values exemplifying the meaning variable by examples from different domains, partly presented as examples, and partly requiring the subject to select the right ones out of presented lists (e.g., for Size and Dimensions the presented examples included big, small, bidimensional, gigantic, large, huge, tiny, short, tall, high). The second phase consisted of elaborating the meaning of each variable, e.g., for sensory qualities—their function, the emotions they evoke; for the conjunctive form of relation—results, structure. The third phase consisted of performing cognitive tasks in which the trained variable is involved, e.g., for locational qualities—planning routes; for results—classifying them according to some principle, e.g., emotional or financial.

In each group of subjects the members got first the manipulation procedure and then the six tasks in random order. There was a 1 - 2 minutes break between any two tasks. The experiment was carried out in small groups of 2 - 5 participants, in the presence of an experimenter. Reliability tests based on Cronbach's alpha were applied.

The statistical procedures applied for analyzing the findings were Pearson correlations and independent mean comparisons by t-test. Reliability checks were done by using Cronbach's alpha coefficients.

6. Results

Preliminary analyses showed that the four tasks of logical reasoning, labels, verbal memory and visual memory were correlated with one another positively and significantly (in the range of 0.28, $p < 0.05$ to .33, $p < 0.01$). The sorting test was correlated only with logical reasoning (-0.31 , $p < 0.01$). Reliability checks were done for the reasoning test, labels test and the MBAS (Cronbach's alpha coefficients were in the range of 0.70 - 0.82).

Table 2 shows that the subjects exposed to the concrete mode manipulation (viz. concrete group) differed significantly from the subjects exposed to the abstract mode manipulation (viz. abstract group) in the means of the sorting test, logical reasoning, labels test, visual memory, MBAS total score and score on actional-dynamic and sensory aspects. The findings indicated that as expected the concrete group made more mistakes in switching on the sorting test, scored lower on the logical reasoning test, provided fewer general labels for photos, and manifested better memory for visually presented items than the abstract group.

Table 2. Means, standard deviations and mean comparisons of the six tasks in the groups that were exposed to the “concrete” or “abstract” manipulations.

Groups	Exposure to “concrete” manipulation		Exposure to “abstract” manipulation		T-test
	Mean	SD	Mean	SDS	
Tasks					
Sorting test [no. of mistakes]	7.2	1.3	3.3	1.4	8.715****
Logical	9.2	3.5	11.2	3.8	2.479*
Labels ^a	10.1	3.5	14.9	4.3	4.388****
Verbal memory	18.7	4.1	20.2	4.9	1.503
Visual memory	21.1	3.9	15.9	4.5	5.591****
MBAS: No. of items with responses 3 or 4	16.11	3.7	13.9	4.7	2.355*
MBAS: Score in actional-dynamic + sensory aspects	5.1	2.9	3.4	1.3	3.425 ***
MBAS: score in experiential +contextual aspects	6.8	2.9	6.1	3.1	1.056

^aThe scores for the two types of photos were combined because they did not differ significantly in either of the two groups.

A complementary formulation of the findings would be that the abstract group made fewer switching mistakes on the sorting task, solved correctly more logical reasoning problems, provided more general labels for the photos, but had lower scores in visual memory, in the MBAS in general and in the actional-dynamic plus sensory aspects of the self image. The groups did not differ in verbal memory and in the score for experiential and contextual aspects of the self image.

The findings concerning the sorting test, labels provision, visual memory and the actional-dynamic and sensory aspects of the self image are significant also in view of the Bonferroni criteria.

7. Discussion

The findings provide full support for the hypotheses in regard to most of the examined variables. They show that as compared to the abstract group, the concrete group made more mistakes on the sorting test, which indicates that they manifested more perseveration and less flexibility in switching from one rule of organization to another. Further, they evidenced a lower level of logical reasoning which requires applying specific clear cut rules for deducing a conclusion from given postulates or facts. In the task that required providing labels for photos the concrete group manifested a lower conceptualization level and focused instead on listing the different items in the photos. In the visual memory task they proved better memory than the abstract group. All these results are in accord with our hypotheses. However, contrary to the hypotheses, there was no difference between the groups in verbal memory, probably because verbal memory relies on skills that are continuously enhanced by repeated habitual practice to an extent that makes it hard to change by a relatively brief experimental ma-

nipulation. The other unexpected result is that the concrete group scored higher on the self image scale than the abstract group. This indicates that the concrete group referred to more aspects of the self when describing their self-image. The reason for this seems to be reflected in the higher score they got on the actional-dynamic and sensory aspects of the self descriptions. The concrete mode was manifested in more attention to the dynamic and the external details of the self image. Notably, the groups did not differ in the partial MBAS score representing the experiential and contextual aspects of the self.

The findings show that manipulating experimentally particular meaning variables of the meaning system that were selected as reflecting the concrete mode or the abstract mode of approach has a predicted effect on performance in a wide ranging set of tasks and even in regard to a personality measure of self-image. The two important points in the results are first, that the changes have been attained by manipulating specific meaning variables rather than directly cognitive variables, and secondly, that the obtained changes concerned a broad range of cognitive tasks and even a personality-based measure. These results imply that the changes in cognition attained by the manipulation of specific sets of meaning variables were comprehensive and basic. Changes of this kind correspond to what is justified to consider as changes in state of consciousness.

The findings have important implications both theoretically and practically. The theoretical contribution consists mainly in the evidence that there may exist different states of consciousness, that are characterized by various cognitive and other dimensions and that they may be evoked by means of meaning-based manipulations. The practical implication consists in the evidence that individuals function differently in different states of consciousness. For example, the study showed that individuals in the concrete mode have a better visual memory while those in the abstract mode have higher achievements in logical reasoning. Hence, if visual memory is considered as useful in some context, the concrete mode should be produced, but the abstract mode is to be preferred when logical reasoning or flexibility in shifting are considered as necessary for success in functioning. Furthermore, it is likely that the concrete and abstract modes have more manifestations beyond those examined in the present study. Our findings imply that both the concrete and the abstract modes may be produced by individuals themselves if they are taught to do so.

The original assumption that the concrete and the abstract modes correspond to states of consciousness was supported by the present findings. However, this conclusion should be considered merely as preliminary because of the following reasons. The samples of subjects in the present study were limited. The members of each sample were exposed only to one of the two experimental manipulations of meaning variables, whereas a case could be made for the necessity of exposing each member to both modes in a randomly sequential manner as has been done in studies in regard to other states of consciousness (Kreitler, 1999, 2013a). Further, a more conclusive statement concerning states of consciousness would require testing the effects in regard to a broader set of cognitive and other tasks,

including also more manifestations in personality, emotions and behavior. Hence, the present study is merely a first step in the direction of identifying the concrete and abstract modes as states of consciousness. As such they contribute to defining and expanding the domain of research into states of consciousness beyond the two states of personal-subjective and interpersonally-shared states of consciousness that have been studied up to now.

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