UNCONSCIOUS MENTAL PROCESSES AND ACTION: A COGNITIVE APPROACH

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[T]he development of consciousness, the 'spirit,' is for us nothing less than the symptom of a relative imperfection of the organism; it means trying, groping, blundering—an exertion which uses up an unnecessary amount of nervous energy. We deny that anything can be done perfectly as long as it is still done consciously. The 'pure spirit' is a pure stupidity: if we subtract the nervous system and the senses—the 'mortal shroud'—then we miscalculate—that is all!

Nietzsche, *The Antichrist*, 14

UNCONSCIOUS MENTAL PROCESSES

- Consciousness is often said to be the characteristic of the mental. However, many, if not most, of our mental processes occur in ways that are temporarily or permanently inaccessible to us. Nonetheless, they underlie much of our acting in the world, and in some pathological situations they are the only means by which percepts are processed with a view to the wellbeing of the individual. The stimuli that can be processed in an unconscious way range from the merely physical (e.g.: the position of one's body while sleeping on a narrow flat surface) to the emotional (e.g.: fear), and we have reasons to believe that meaning can be processed at various levels in purely unconscious ways.

ACTION

- We are said to act according to our conscious beliefs and wishes, and thus we are liable to answer for our actions in many ways (legal, moral, ethical, and, perhaps, even esthetical). The postulation of unconscious mental processes underlying much of our acting in the world clearly raises problematic issues to do with agency, namely the question of establishing the extent to which we are really responsible for our actions.
- Although humans are commonly considered non-responsible for violent or otherwise offending actions prompted by evident states of unconsciousness (e.g.: somnambulism, hypnosis, …), only recently have we realized that often prejudiced or aggressive behavior is underlain by mental processes occurring outside the conscious control of the individuals concerned.
- On the other hand, successful behavior is usually attributed to the conscious individual, but we are now beginning to realize that this, too, is often the result of unconscious mental processes.

TWO APPROACHES TO UNCONSCIOUS MENTAL PROCESSES

- This is the main difference between the two major approaches to unconscious mental processes, to wit, the *dynamic* and the *cognitive*: whereas for the former unconscious mentation is mostly (though not only) involved with negatively valued processes and behavior, the latter sees it as a normal, parallel, to a great extent independent means of information processing. Thus, whereas psychoanalysis searches for evidence for the unconscious in "various pathological physical and mental phenomena: dreams, phobias, psychosomatic illness, hysteria, 'faulty' actions such as slips of the tongue, etc." (Weintraub, 1987), cognitive psychology takes it that all kinds of human information processing have unconscious components.

THE DYNAMIC APPROACH

- For Freud, the unconscious (e.g.: Freud, 1915), or, later on, the id (Freud, 1923) is seen as a source of conflict for the conscious self, or ego, thus lying at the root of neurosis:
- *The nucleus of the* Ucs. *consists of instinctual representatives which seek to discharge their cathexis; that is to say, it consists of wishful impulses.* […] *There are in this system no negation, no doubt, no degrees of certainty: all this is only introduced by the work of the censorship between the* Ucs. *and the* Pcs. *(*Freud, 1915)
- […] *we obtain our concept of the unconscious from the theory of repression. The repressed is the prototype of the unconscious for us.* (Freud, 1923)
- [*The id*] *is the dark, inaccessible part of our personality* […] *a chaos, a cauldron full of seething excitations.* (Freud, 1933)
- *A neurosis is* […] *the result of a conflict between the ego and the id, upon which the ego has embarked because, as careful investigation shows, it wishes at all costs to retain its adaptability in relation to the real external world. The disagreement is between the external world and the id.* (Freud, 1926)

THE COGNITIVE APPROACH

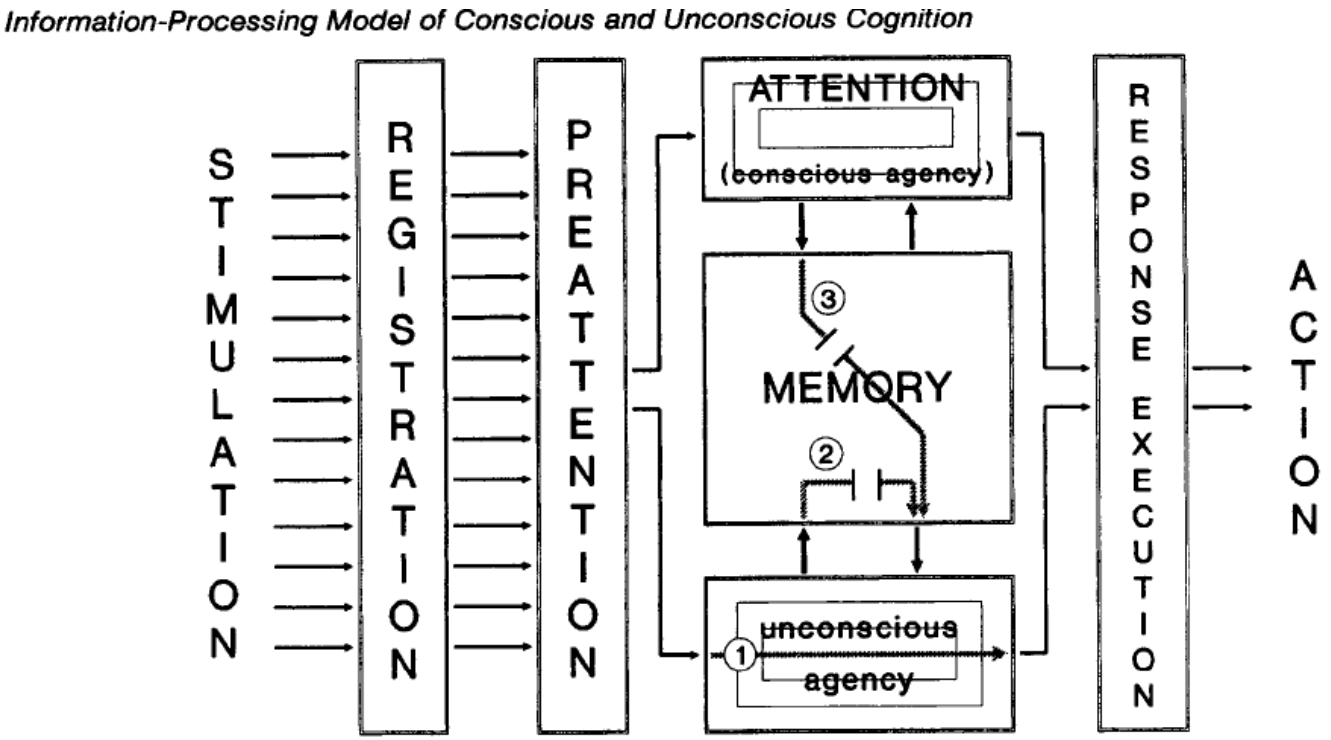
- The cognitive approach emphasizes the information processing character of unconscious mentation: a substantial amount of information relevant for the wellbeing and survival of the individual is processed (acquired, stored, and retrieved) in ways that are *inaccessible* to consciousness. Albeit inaccessible, this information is *available* to the system, influencing, or even determining, our behavior, *even that which we see as consciously determined*.
- A fundamental tenet is that successful information processing conduces to knowledge, and the talk is thus often of *unconscious knowledge*.
- The question of whether *an* unconscious really exists is seen as impossible to answer; the cognitive approach primarily seeks to find out in which way and to what extent unconscious mental processes, and their consequences in action, are *qualitatively* different from those occurring in a conscious way. E.g.: how qualitatively perceived is a subliminal stimulus, and what distinctive consequences in a subject's behavior will it have?

BASIC PRESUPPOSITIONS AND METHODOLOGY

- The basic presuppositions are either that stimuli are firstly perceived and processed in an unconscious way, before consciousness enters the scene (unconscious mentation precedes consciousness, and this in an also evolutionary sense), or that stimuli can be processed entirely in an unconscious way, regardless of conditions of exposure. Another basic presupposition is that the information perceived and processed in an unconscious way is stored in a knowledge base inaccessible to consciousness. The approach is thoroughly empirical, though there is an important theoretical component. Experimentation often aims to measure the extent to which performance on tasks contradict the subjects' meta- and/or self-knowledge.

A THEORETICAL ACCOUNT

(Greenwald, 1992)



THE COGNITIVE ROADS TO THE UNCONSCIOUS

Kihlstrom's Four Roads (Kihlstrom, 1993):

- Automaticity
- Neuropsychology
- Subliminal Perception
- Hypnosis

Other roads:

- Anesthesia
- Sleep
- Attitudes towards self and others
- Social Stereotypes

THE PHENOMENA

- Given that the cognitive unconscious is claimed to be involved in all spheres of our behavior, from automatisms to social interaction, the range of phenomena empirically researched is quite vast. Those that more directly involve **action** are

- Learning and memorizing;
- Decision making;
- Judgment making (about others and self);
- Orientation in space;
- Emotional processing.

LEARNING AND MEMORIZING: ARTIFICIAL GRAMMARS

- Much of the necessary learning that comes with being human is done unconsciously: for instance, we learn our native languages without a specific, formal learning strategy, and most speakers without a formal linguistic education can readily spot mistakes, despite being incapable of explaining them. A. S. Reber initiated research with artificial grammars in the late sixties (Reber, 1967) aiming at experimentally confirming that highly complex systems such as grammars are learned by subjects despite there being no learning strategy involved: exposed to strings of letters generated by an artificial grammar, subjects are actually capable of distinguishing grammatical from non-grammatical strings well above chance, while being unable to describe its rules.

ARTIFICIAL GRAMMARS

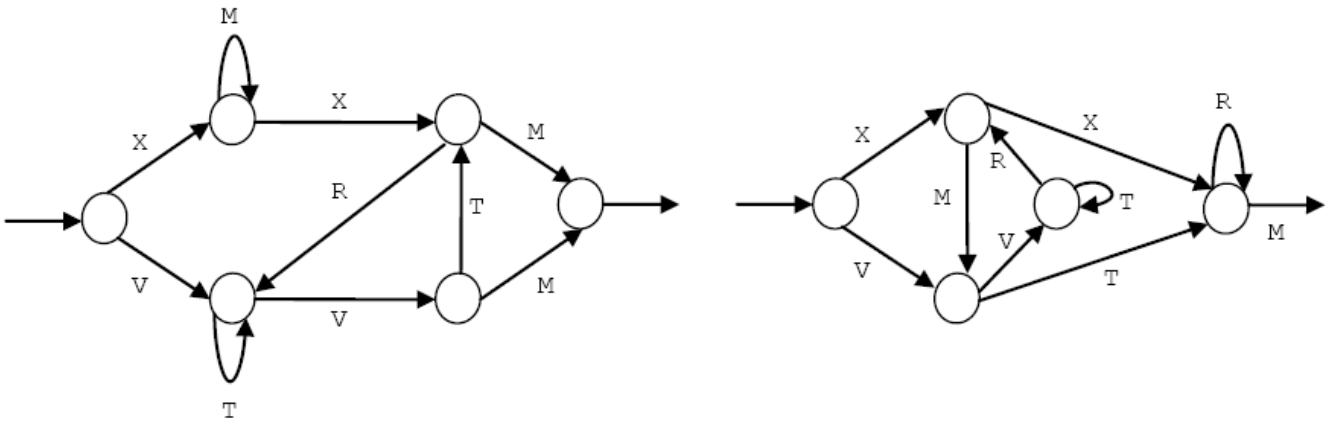


Fig. 1 – Two synthetic grammars, both in Dienes et al. (1995); grammar A follows Reber (1969). A few examples of strings allowed by grammar A: xmxrttvtm, vttvtrm, xmmxrvm, vtvtm, xxrvtm, etc.

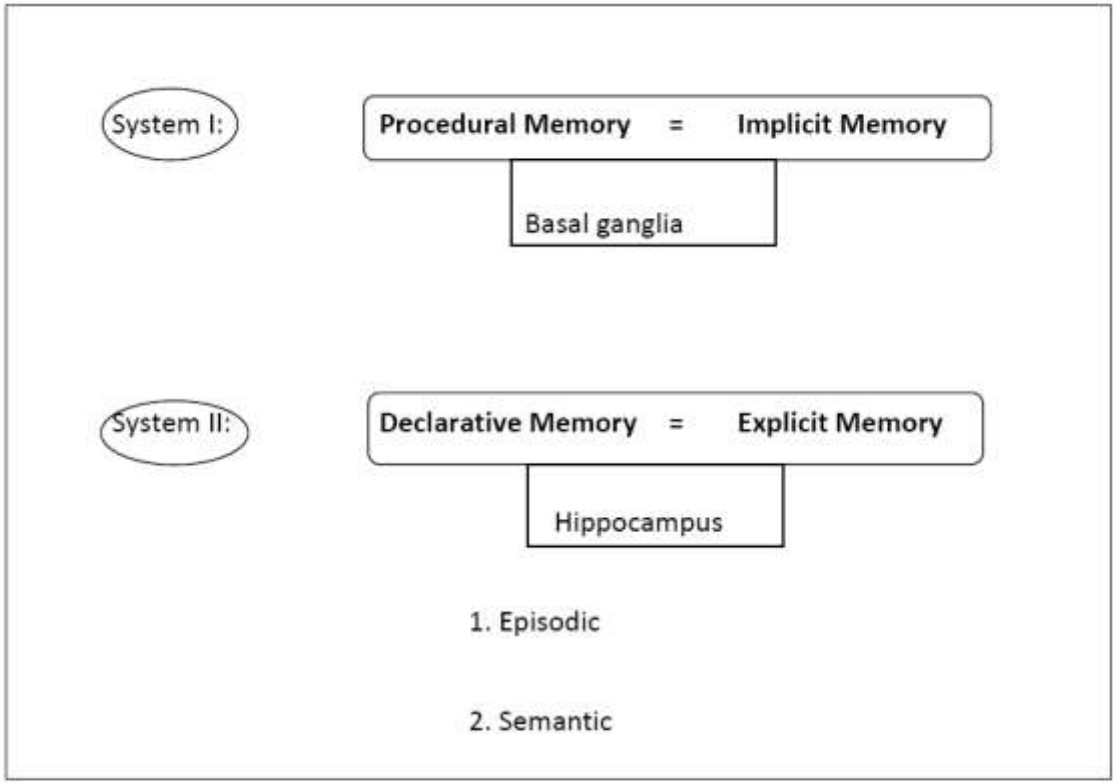
Learning and Memorizing: Simulated Systems

One of the main distinguishing features of unconscious knowledge is that it is *procedural* (vs. *declarative*). Using simulated systems (e.g.: sugar factory), Broadbent and colleagues have shown that while subjects soon become skilled at controlling those systems, this is not accompanied by an improvement in their capacity to verbalize what it is they are actually doing (Berry & Broadbent, 1984).

LEARNING AND MEMORIZING: IMPLICIT MEMORY

Can amnesics learn? Yes, if in a wholly unconscious way. Not only have studies found out that there are contents that are never lost in amnesia, though they are not consciously retrieved, but it has also been shown that amnesics can learn new information: for instance, subjects show normal progressing in skill learning, despite not explicitly remembering that they have learnt it. A classical 'experiment' was carried out by Claparède (1911): when shaking hands with a patient, he pricked her with a pin hidden in his hand; despite having a profoundly anterograde amnesia, and thus not consciously remembering this incident, from then on the patient refused to shake hands with him.

IMPLICIT / EXPLICIT MEMORY



Memory Systems I and II and the Procedural/Declarative and Implicit/Explicit Distinctions. (Augusto, 2009)

DECISION MAKING: THE SOMATIC MARKER HYPOTHESIS

Postulating that normal decision making is guided by somatic markers, somatic changes associated to cognitive states that arise in bioregulatory processes, Damásio's Somatic Marker Hypothesis is a contribution to research on the cognitive unconscious: Damásio and colleagues have found that, in a card selection game (Iowa Gambling Task), control subjects produce significant anticipatory skin conductance responses when preparing to chose a card from a 'bad' deck. They claim that success in the task is achieved to some (great?) extent by this unconscious guiding component of decision making.

THE SOMATIC MARKER HYPOTHESIS

(Bechara et al., 1997)

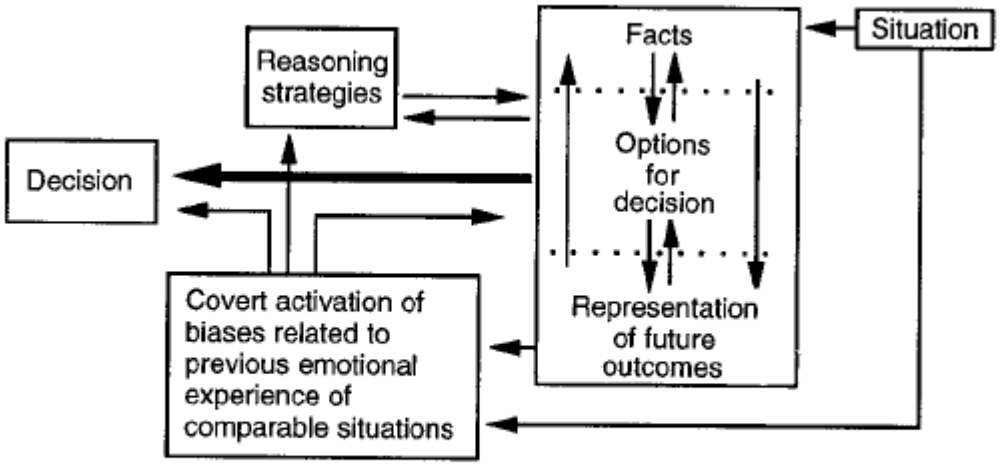


Diagram of the proposed steps involved in decision-making.

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JUDGMENT MAKING: ATTITUDES AND STEREOTYPES

- Attitudes towards social objects appear to be often (primarily?) activated outside consciousness, but they strongly condition, or even determine our social behavior: for instance, Downs & Lyons (1991) found that more attractive defendants in misdemeanor cases are frequently given smaller fines and lower bails (*halo effect*).
- Stereotypes, also strongly guiding social behavior, are also claimed to often work in an unconscious way. Lewicki (1986) experimentally led subjects to generate an unconscious "encoding algorithm" (a stereotype) associating long-hair with intelligence; when presented with long-haired people whose intelligence they knew nothing about, they tended to see them as intelligent.

ORIENTATION IN SPACE

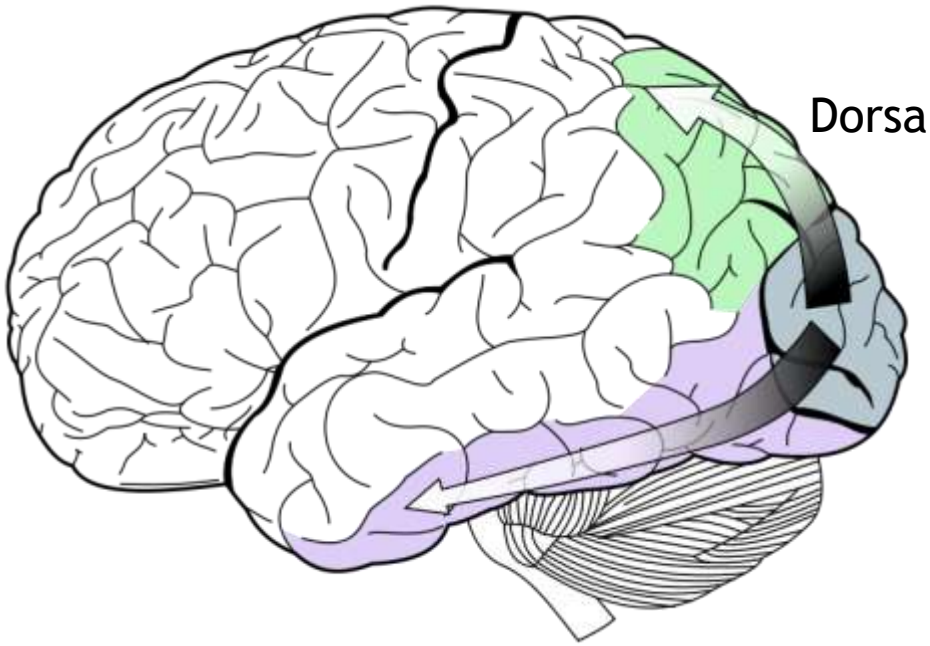
- Moving around requires careful negotiation of obstacles; this negotiation is normally done for the most part in an unconscious way, carried out by the dorsal stream, or "vision for action," a parallel, independent visual system concerned with low-frequency 'metric' data of objects (shape, size, orientation, motion, and location). This explains skillful orientation in space and negotiation of obstacles in cases in which the ventral stream, or "vision for perception," is greatly damaged or even absent: in fact, patients with blindsight and left visuo-spatial neglect, who are incapable of identifying visual stimuli in their blind visual fields, may nevertheless manage to move among obstacles with the necessary skill (e.g.: de Gelder et al., 2008).

MAKING SOCIAL JUDGMENTS & SELF-KNOWLEDGE

Female subjects were asked to make four judgments about a young woman after reading her "job application portfolio." Five characteristics of the young woman were manipulated orthogonally (e.g., physical appearance, academic credentials). Subjects were asked to report how each of the five manipulated factors had influenced each of their judgments. "Observer subjects," who had access only to very impoverished descriptions of each of the five factors, were asked to predict how each of the factors would influence each of the judgments. Results showed that (a) subject reports about the effects of the factors on the judgments were in general highly inaccurate; (b) observer predictions were extremely similar to subject reports; (c) for the single judgment for which subjects showed substantial accuracy (a judgment about intelligence), observer predictions were as accurate as subject reports.

(Nisbett & Bellows, 1977; Abstract)

ORIENTATION IN SPACE: THE DUAL VISUAL SYSTEM HYPOTHESIS



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EMOTIONAL PROCESSING

Interestingly enough, anatomically and functionally, the two visual streams correspond to two distinct pathways to the limbic system: the dorsal and ventral *visuolimbic* pathways. This distinction can account for the fact that, though incapable of recognizing faces (often their own included!), patients with prosopagnosia nevertheless produce significant skin conductance responses when presented with faces of familiar people (Bauer, 1984; Tranel & Damásio, 1985). In what has been dubbed affective blindsight, patients show that they respond to emotional visual stimuli; for instance, Hamm et al. (2003) conditioned a cortically blind patient by administering an aversive electrical shock (CS) simultaneously with a visual stimulus (US): shown the visual stimulus later on, the subject produced greater startle reactions (blinking) than those elicited in the absence of visual cues.

Consciousness is the last and latest development of the organic and hence also what is most unfinished and unstrong. Consciousness gives rise to countless errors that lead an animal or man to perish sooner than necessary, "exceeding destiny," as Homer puts it. […] One thinks that it constitutes the kernel *of man; what is abiding, eternal, ultimate, and most original in him! One takes consciousness for a determinate magnitude! One denies it growth and its intermittences! One takes it for the "unity of the organism"!— This ridiculous overestimation and misunderstanding of consciousness has the very useful consequence that it* prevents *an all too fast development of consciousness. Believing that they possess consciousness, men have not exerted themselves very much to acquire it—and things haven't changed much in this respect! To this day the* task of incorporating knowledge *and making it instinctive is only beginning to dawn on the human eye and is not yet clearly discernible—a task that is seen only by those who have comprehended that so far we have incorporated only our* errors *and that all our consciousness relates to errors!*

Nietzsche, *The Gay Science*, 11

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