

## What This Discipline Needs Is a Good Ten-Cent Taxonomy of Consciousness

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It is well known that scientific psychology began as the study of consciousness (Hilgard, 1987). But the behaviourist revolution, which abjured mentalistic constructs of all types, effectively put a hold on that agenda. One of the most salutary by-products of the cognitive revolution has been a revival of interest among psychologists in the nature and function of consciousness. It is no longer the topic that dare not speak its name. There is no longer any doubt that most of us are conscious, at least most of the time. Now the questions are different: How is consciousness achieved? What is consciousness good for? And what are the relations between conscious and nonconscious mental processes?

This last, of course, is an old issue. Helmholtz argued that conscious perception was the product of unconscious inference, and Freud argued that our conscious mental life is determined by unconscious ideas, impulses, emotions, and defences arrayed against them. From a more contemporary perspective, Bowers gives us a wide variety of good reasons to be concerned with this problem. But it seems that progress on this front will only come when we have a clear vocabulary for describing the varieties of conscious and unconscious mental structures and processes — in other words, a working taxonomy of consciousness. In an earlier paper instigated by Ken Bowers, I made a provisional attempt at such a taxonomy (Kihlstrom, 1984).

In this comment, I should like to take his essay as an opportunity to update my thinking.

Within contemporary cognitive psychology, one common view of the relations between conscious and nonconscious mental life appears implicit in the distinction frequently drawn between declarative and procedural knowledge. Declarative knowledge represents facts about the world encoded in propositional format, whereas procedural knowledge represents skills, rules, and strategies that operate on declarative knowledge to control experience, thought, and action. In principle, the argument goes, declarative knowledge is accessible to direct introspective awareness, if the conditions are right, whereas procedural knowledge is not available under any circumstances. That is, declarative knowledge is available to consciousness, and procedural knowledge is not.

For example, in the ACT\* system of Anderson (1983), consciousness appears to be identified with *working memory*, a segment of declarative memory that contains activated mental representations of the organism in its local environment, current processing goals, and information (processed through the sensory-perceptual system or retrieved from memory) that is relevant to those goals. Some of these representations comprise the goals and conditions relevant to various production systems. If these are activated, then the production is executed, and the product is deposited in working memory as another activated cognitive structure. The individual is aware of the goals and conditions, and of the products, but not of the operation of the production system.

The ACT\* system, then, exemplifies the idea that unconscious mental processes influence conscious experience, thought, and action. And similar ideas are now commonplace within cognitive psychology. Thus, a number of theorists appear to agree that certain mental processes

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operate automatically and unconsciously. By this standard, there appears to be considerable consensus that a taxonomy of mental life can be produced by distinguishing between conscious cognitive contents (declarative knowledge) and the unconscious cognitive processes (procedural knowledge) that operate on them. These ideas are not very far from Helmholtz's conclusions concerning unconscious inference in perception.

But they are very far indeed from those of Freud (and other dynamic psychiatrists, such as Pierre Janet and Morton Prince, as well). Freud argued not just that certain mental *processes* (in his case, repression and other mechanisms of defence) were excluded from consciousness, but that certain mental *contents* (such as primitive sexual and aggressive wishes, latent homosexuality, and the transference relationship with the therapist or other significant objects) were denied introspective access as well. Cognitive psychology makes room for such processes only grudgingly, if at all. The problem is caused by the identification of consciousness with activation. Procedural knowledge operates only on activated declarative knowledge; activated declarative knowledge is, by virtue of its residence in working memory, conscious. If a percept, memory, or thought influences ongoing mental life, it must be conscious; if it does not, this is because it is latent. Thus, the idea of active but nonconscious declarative knowledge is dismissed almost by definition.

This dismissal would be acceptable if there were not good reasons to suppose that mental functioning can be influenced by declarative knowledge that is not accessible to direct introspective awareness. Consider, for example, the various phenomena subsumed under the notion of "subliminal" perception — the influence of stimuli that are not consciously perceived (for reviews see Dixon, 1981; Klatzky, 1984). The classic demonstrations, for example those by the New Look theorists, have been roundly criticized on methodological grounds. But more recent demonstrations, such as those by Marcel (1983) and Greenwald (Greenwald & Liu, 1985), seem to avoid those methodological pitfalls. There now seems to be considerable agreement that attentionless processing, if not detectionless processing as well, is possible. Within a generic network model of memory, such findings can be interpreted in terms of procedural knowledge structures operating on declarative knowledge structures that possess some

degree of activation, but not sufficient to cross the threshold required for residence in working memory. Such knowledge structures cannot be classified as unconscious in the strict sense, because they could be accessible to consciousness if sufficiently activated. Following Dixon (1981), we can classify these declarative knowledge structures as *preconscious*.

But subliminal perception does not exhaust our taxonomy. Consider a patient with amnesic (Korsakoff's) syndrome, who repeats a list of words as they are read to her. On a subsequent memory test, she recalls nothing of the list; yet, when later asked to perform a word-fragment-completion task, she shows an advantage in perceptual identification for items drawn from the forgotten wordlist (Schacter, in press). Similar phenomena may be induced by hypnotic suggestion. In posthypnotic amnesia, the subject may be unable to recall a list of words memorized during hypnosis until the amnesia suggestion has been cancelled by a prearranged cue. Yet the subject will show priming effects on various semantic memory tasks that are equivalent to those shown by subjects who recall the list perfectly well (Kihlstrom, 1985b).

The words in these examples are not conscious, but they do not seem properly classified as unconscious or preconscious either. In the first place, as declarative knowledge they are clearly available to consciousness, at least in principle. If the amnesic patient did not suffer brain damage, or if the hypnotic suggestion had not been given, there would have been no problem with memory. In the second place, the items in question had not been subliminally presented: amnesic patients and hypnotic subjects were fully aware of the words at the time they were presented. Finally, the magnitude of the priming effects observed in these experiments indicates that they were, by any standard, fully activated. Yet memory representations of the words are not accessible to direct introspective awareness. Following the older usage of Janet, James, and Prince (Hilgard, 1977; Kihlstrom, 1984), we can refer to these structures, fully activated yet outside awareness, as *subconscious*. The category is important because it suggests that activation is not sufficient to guarantee residence in working memory — and thus consciousness (Kihlstrom, 1985a).

The ontological status of nonconscious *procedural* knowledge appears to be well established. At least, nobody ever seems to argue

about it anymore. The existence of nonconscious *declarative* knowledge is considerably more controversial, but favourable evidence is accumulating at least for the categories of preconscious and subconscious. What about strictly *unconscious* declarative knowledge, of the type envisioned by Freud? Like unconscious procedural knowledge, these contents can be known only indirectly, by inference. In my view, the current evidence for the existence of unconscious declarative knowledge structures is very weak, because it relies on the sorts of clinical inference procedures that have always plagued psychoanalytic theory. Sometimes these inferences seem intuitively correct, as in Bowers's case of agoraphobia. Often, however, such interpretations strike the open-but-sceptical reader as glib if not vulgar. The validity of psychoanalytic rules for referring symbols to the objects they represent, and for retracing the sequence of defence mechanisms linking conscious ideas to unconscious ones, is simply not well documented at present. The answer may be yes, but we simply do not know for certain.

It should be noted that the questions con-

cerning preconscious, subconscious, and unconscious declarative knowledge structures are separate from and independent of each other. For example, evidence for the existence of subconscious processing — that is, the processing of subconscious information — does not rely on evidence favouring preconscious or unconscious processing, and vice versa. Psychology has moved a long way from the position that excluded problems of consciousness from its purview, and most psychologists are no longer embarrassed to use the term in their papers and books (even in the titles!). The situation is quite different from what obtained in the era of the *New Look*. A variety of phenomena observed in the clinic, everyday life, and even the laboratory invite (maybe *demand*) a taxonomy of preconscious, subconscious, and unconscious knowledge structures, and our working theories seem able to accommodate these phenomena without too drastic modification. Bowers's essay invites us to put phenomena and theories together and produce a taxonomy of consciousness that is faithful to mental life.