

## The Unconscious Feeling of Knowing: A Commentary on Koriat's Paper

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In Koriat's paper "The Feeling of Knowing: Some Metatheoretical Implications for Consciousness and Control," he asserts that the feeling of knowing straddles the implicit and explicit, and that these conscious feelings enter into a conscious control process that is necessary for controlled behavior. This assertion allows him to make many speculations on the nature of consciousness itself. We agree that feelings of knowing are produced through a monitoring of one's knowledge, and that this monitoring can affect the control of behavior such as whether or not to search memory for an answer. Further, we believe that monitoring of performance with a strategy can also affect cognition control and strategy selection; however, we also believe that frequently this monitoring and control occurs without conscious awareness. Feeling of knowing has received an inordinate amount of attention because it lies behind the highly recognizable tip-of-the-tongue phenomenon that represents one of the rare cases of conscious monitoring. There are other feelings of knowing which are much more common and are not accompanied by conscious awareness. These are evident in the early selection of a strategy for answering a problem. In our view, the research on feeling of knowing will not resolve the question of whether consciousness is merely epiphenomenal. © 2000 Academic Press

Asher Koriat's "The Feeling of Knowing: Some Metatheoretical Implications for Consciousness and Control" argues that the metacognition found in the feeling of knowing is a unique bridge in the mind between the implicit and the explicit—between the unconscious and the conscious. Throughout the paper, he links metacognition and consciousness closely together. In this Commentary, we will question this link and give examples of when metacognition is not conscious.

Defining what is and what is not metacognition has been an ongoing problem. Nelson (1996) suggested a way of thinking about metacognition that has proved quite useful. He defined metacognition as consisting of two processes: monitoring and control. Monitoring is the collection of information about one's knowledge and performance. Control is a self-regulation process. The question arises whether metacognition implies conscious control. We agree with Koriat that knowledge influences feeling of knowing; indeed our position is that people are influenced by both their performance and knowledge and that they adjust their strategies or procedures accordingly. However, unlike Koriat, we believe that much of this happens implicitly, or

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automatically, without conscious awareness. The experimental evidence that strategy selection is most often unconscious leaves us with two options: strategy selection is either an unconscious metacognitive process; or, if metacognition implies awareness, it is an implicit process (Reder & Schunn, 1996).<sup>1</sup>

The feeling of knowing has been of interest to psychologists for many years for strictly functional reasons. There seems to be a correlation between various behaviors and the feelings of knowing subjects report. Nelson has shown that a subject's feeling of knowing rating is related to the amount of study time a subject devotes to an item and the amount of time a subject perseveres in the search for an answer. The feelings of knowing are correlated with whether the subject actually has the answer in memory, but the behaviors they lead to can occur before the answer is actually retrieved.

Koriat classifies metacognition into information-based and experience-based. The former are metacognitive processes that are based on explicit knowledge. When one realizes one has failed the past four tests in organic chemistry and decides to study very hard for the final, this is information-based. The latter are processes that are triggered by implicit, unconscious knowledge. According to Koriat, feelings of knowing belong to this category, as they are related to some answers that are not yet accessed. "Experience-based metacognitive judgments, such as the feeling of knowing . . . are implicit as far as their antecedents are concerned, but explicit as far as their phenomenal status and behavior consequences are concerned."

This Commentary will first address Koriat's view of the feeling of knowing and how cue familiarity and accessibility interact. We will present a somewhat different suggestion concerning how the two interact. Then, we will proceed to Koriat's discussion of the consciousness of control. We will argue that the experience-based metacognition is frequently unconscious, and that no conclusions can be made about the causal role of consciousness based on its link with metacognition.

## THE ANTECEDENTS OF THE FEELING OF KNOWING

Koriat expounds the unique ability of the feeling of knowing to tap into unconscious/implicit knowledge and render it into a qualitative subjective feeling useful for conscious-directed behavior. An important question arises as to what implicit knowledge actually leads to a feeling of knowing. There are two main theories on this which have been offered. Let us consider solving a multiplication problem such as  $17 \times 13$ . The prominent theory was that one always searched one's memory first to find out if the answer could be had by retrieval (Siegler & Shrager, 1984). Under this assumption, it is reasonable that a feeling of knowing, in which one "felt" that one knew the answer but could not yet produce it, would reflect some accessing of a memory trace to the actual answer stored in memory. It is important to note that the direct-access theory of Hart (1965) was modified by the accessibility theory of Koriat (1993). This accessibility theory refines its forerunner by allowing retrieval

<sup>1</sup> We wish to remain agnostic as to whether metacognition must be a conscious process. There are those who would argue that metacognition, as a higher-level thought process, by definition must be conscious. If metacognition must be viewed as always conscious, then the processes that we discuss in this paper belong to a larger class of control processes that include as a subset metacognitive processes.

of partial products of an answer, whether or not that answer is the correct one, to influence this feeling. In other words, this feeling is thus in some way a measure of the accessibility of the knowledge one has, correct or incorrect (Koriat, 1993).

Experimenters who follow in this tradition have tended to focus on the feeling of knowing as related to the tip-of-the-tongue phenomena. This affected both the perception of the consciousness of the feeling of knowing, and where experimenters looked for the feeling of knowing. They tended to measure for it after a failed recall attempt or through confidence judgments. Even in those cases in which they assessed a feeling of knowing before an answer was given, it was measured after the subject had considered the question for several seconds (Koriat & Goldsmith, 1996).

Recently, there have developed a few theories which posit that one decides very early (in less than a second) what strategy to use in answering the question (e.g., Miner & Reder, 1994). One might not get a feeling of knowing for  $17 \times 13$  (maybe because the numbers in  $17 \times 13$  are ones that have never been drilled), so one would not even try to retrieve an answer, but instead one would proceed directly to calculating the answer to be 221. Such an early feeling of knowing is a heuristic on which strategy choice is based. Under this latter theory, a natural source for a feeling of knowing is one's familiarity with the problem, as retrieval has not yet been chosen. Reder has developed a model that such a cue familiarity feeling of knowing arises from an intersection of activation at a problem node of at least two cues/components of the problem. The activation at the problem node will reflect its base level strength and the incoming activation from the components. Thus, the presence of both 17 and 13 in the problem might trigger a feeling of knowing if the resulting activation passed threshold, thereby guiding strategy selection to attempt retrieval (Reder, 1987; Reder & Ritter, 1992; Schunn et al., 1997). This knowledge about one's experiences can in turn be linked with whether the answer to the problem is in one's memory or not. It is highly probable that one would know the answers to problems one has seen frequently, thus selecting a strategy based on this early feeling of knowing is a good heuristic.

### *Cascading Feeling of Knowing*

Much debate has passed not only between these two theories on strategy use, but also on the nature of feeling of knowing under the assumption that early strategy selection does take place (Reder, 1982; 1987). Koriat expresses his view of the coexistence of both cue familiarity and accessibility leading to a feeling of knowing, "In fact, a recent study (Koriat & Levy-Sadot, submitted) suggests that the two heuristic, cue familiarity and accessibility, exert their influence on FOK [feeling of knowing] in a cascaded manner: At a very early stage in memory search, FOK judgments are primarily determined by cue familiarity, whereas at a somewhat later stage, accessibility may also come to play a role, contingent on a relatively high level of cue familiarity."

According to this view, cue familiarity serves the role of testing the waters on whether it will be likely that an accessibility "search" will be successful. Based on the level of cue familiarity, which can be assessed in a short time range, accessibility is either assessed or not, which requires a longer time range. This view implies that

it is the accessibility that is most important, that leads to the feeling of knowing most relevant in behavior control.

A different coexistence of the two feelings of knowing is suggested in (Nhouyvanisvong & Reder 1998, p. 29), “. . . feeling-of-knowing is a typically unconscious judgment that directs strategy use (Reder & Schunn, 1996). In everyday life, people only become aware of these feelings-of-knowing when there continues to be a strong feeling-of-knowing alongside lack of search success, i.e., a tip-of-the-tongue state.” Koriat’s commitment to feeling of knowing as a reflection into a conscious subjective feeling forces him to minimize such a possible interaction between the early feeling of knowing and strategy selection as being metacognitive. In our view, the early feeling of knowing caused by cue familiarity does not merely determine whether the subject will assess the accessibility of the answer, it determines whether the subject will go ahead and retrieve the answer. The basis for this choice to retrieve is not conscious, and so Koriat does not include it as metacognitive. In this way, the feeling of knowing of cue familiarity becomes for him a simple gate to the feeling of knowing of accessibility because the various direct effects of the cue familiarity are not considered part of the metacognitive processes of monitoring and control.

One set of problems which shows a dissociation of cue familiarity and accessibility in leading to a feeling of knowing are studied in Schunn et al. (1997). These arithmetic problems are designed so that they become familiar to the subject (the subjects have seen the problems like  $34 \times 27$  several times in the experiment), but after quickly evaluating whether to retrieve or calculate the answer, the subjects could only try to answer and study the answer to these problems on 2/7 of these trials. This was in contrast to the standard problems to which the subjects were able to try to answer or study the answer every time they made the initial quick evaluation. This difference in problem type was especially interesting because according to the accessibility theory, the feeling of knowing for special problems should be less than that for standard problems. The special problems get little training on the answer, so any trace to the correct answer stored in memory should be substantially weaker than for standard problems. Therefore, according to the accessibility theory, this should cause people to choose to retrieve the answer less frequently for special problems. In contrast, under the cue familiarity theory, the familiarity which one has with special problems should be a function of exposure time to the problem, not exposure to the answer. Subjects’ tendency to select retrieve should be a function of problem familiarity, not answer accessibility. Schunn et al. found that while accuracy and latency to answer the problems depended on the number of trials in which the subject was exposed to the answer, tendency to select *retrieve* depended on familiarity or exposure to the problem itself.

## IS METACOGNITION PRIMARILY A CONSCIOUS PROCESS?

Koriat centers much of his discussion around Nelson’s conception of metacognition as composed of monitoring and control. Koriat describes the information which passes between the monitoring and control as a conscious, subjective feeling. He states that the experience-based (i.e., based on implicit knowledge) metacognitive judgment is what brings consciousness to behavior: “The function of experience-based metacognitive judgments is to augment self control, that is, to allow some

degree of personal control over processes that would otherwise influence behavior directly and automatically, outside the person's consciousness and control." Could there not be a monitoring of one's knowledge that produces an unconscious output, which would in turn feed an unconscious control process? Some evidence has been collected showing the regulation of behavior (strategy selection) in accordance with one's experience with the problems (success histories) wherein the subjects tended not to report any conscious change in strategies or procedures, nor any awareness of a change in the task (base rates) of configurations of stimulus properties that would affect the success of specific strategies/procedures. For example, in Reder (1987), the likelihood that direct retrieval would be a successful strategy was manipulated by altering what proportion of statements to be judged as plausible had been explicitly stated in the story that was being queried. For one group of subjects, 80% of the queries had been explicitly stated if the items were plausible. For implausible items, 80% of the questions had had their contradiction (one critical word altered) stated in the story. For another group of subjects, only 20% of the queries could be answered by searching the story representation for that verbatim statement. The two groups demonstrated remarkably different latency patterns that reflected different tendencies to use direct retrieval (searching for an exact match before trying a reasoning strategy) to answer the questions. Both groups showed very similar patterns for the last 4 stories where the base rate was intermediate (50%) and identical for the two groups. Despite these strong RT effects, subjects reported no awareness of the strategies they were using, the base rate of presented items in the story or any shift in base rate.

Lovett and Anderson (1996) found that subjects were very sensitive to the base-rate that a problem-solving strategy would work, yet many subjects claimed to be solving the problems using other strategies and were also unaware of any shifting base rate. Finally, Chun and Jiang (1998) reported that their subjects were unaware of a dramatic shift in stimulus items that nonetheless affected their performance.

That the subjects could not identify the ways in which the task changes is not the critical point, but Koriat's story requires that some conscious reflection of those changes exist, and that these changes are the basis of the conscious change in behavior. Although it is possible that the conscious aspects of these processes were so fleeting that all the subjects had completely forgotten them by the end of the experiment, this would lead one to seriously question if they were conscious at all.

Linking metacognitive monitoring and control with consciousness is interesting because it includes consciousness in the critical causal chain leading to action/behavior. It is an argument to be added to the long debate in philosophy over whether or not consciousness is epiphenomenal. Koriat quotes Nelson "'... metacognitive judgments are not mere epiphenomena but actually influence one's controlled behavior' (Nelson, 1996)." If these metacognitive judgments are "at the heart of the notion of consciousness," then consciousness is likewise more than a mere epiphenomenon. If monitoring and control can exist without consciousness, where does this leave Koriat's argument? Consciousness can still be epiphenomenal.

## CONCLUSION

Is the feeling of knowing still a topic worthy of study when stripped of its ontological importance of causing the critical bridge between the unconscious and the con-

scious? We believe that it is. The role that early feeling of knowing plays in strategy selection has implications for educational theory and practice, as it relates to the theory of strategy variability. It is also of interest to those who study consciousness. Simply that metacognitive judgments are relatively basic cognitive components which sometimes become conscious makes them worthy of study. The tip-of-the-tongue phenomena provide everyday examples of where metacognitive judgments have reached the level of awareness, but there are many other metacognitive judgments in the form of early feelings of knowing that do not.

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