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Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 37(0)

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Publication Date

2015

Peer reviewed

Rethinking the Conceptual History of the Term ‘Cognitive’

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Abstract

Psychologist-historian Christopher D. Green posits that the word “cognitive” was never intended by its philosophical advocates to be synonymous with “mental” and, consequently, much of what now goes by the name of “cognition” in cognitive science is not really “cognitive” in the strict sense at all (Green in *Canadian Psychology* 37: 31–39). After a brief presentation of his position, I argue that Green does not provide sufficient reason or evidence for us to accept his claim and his proposal ought to be disregarded unless further evidence can be put forth in its defense. In doing so, I clear the ground for a constructive engagement with the conceptual history of the term “cognitive” and its relevance to present-day concerns.

Keywords: history; philosophy; mark of the cognitive

Introduction

For cognitive scientists, “it is easy to give a list of cognitive processes” (Adams & Garrison 2013). When we use the word “cognitive,” we may be referring to thinking, learning, memory, concept formation, reasoning, or emotion—name a few: All “stuff” that relates to the “mental.” It is not so easy to say, of these things that are called cognitive, *where they came from*. Where they came from, known as “the origin of the cognitive,” is a central area of debate in the history and philosophy of cognitive science. If we can specify the origins of cognition, we can better understand how philosophers and scientists have determined what cognition is (i.e. the mark of the cognitive). Insofar as we better understand the mark of the cognitive, we can “explicate what makes cognitive processes, states, or organisms cognitive,” “settle the bounds of cognition” (Elpidorou 2014), and clear up the overuse and/or misuse (Cromwell, H. C. & Panksepp, J. 2011) as well as the “inherently ambiguous” meaning of the term (Baars 1986).

But is the meaning of the term “cognitive” really ambiguous? Was the term intended by its initial supporters to refer to “the mental”? Psychologist-historian Christopher D. Green responded to these questions almost twenty years ago. He did so by tracing the origins of the term “cognitive” in the ethical theories of the early 20th century, through the logical positivistic philosophy of science in this century’s middle part, and into the philosophical psychology of the 1950s and 1960s. Green distinguishes between what he claims was the intended “strict sense” of the term “cognitive,” being *truth-evaluable*¹ and the unintended “loose sense,” being anything regarded as “mental.”

For Green, “the application of the term ‘cognitive’ to problems of mind by philosophers was intended specifically to divide the mental into two categories—one to which the methods of logic and computer science could be successfully applied—the ‘cognitive’—and one to which they could not” (Green 1997). According to Green, the term cognitive “was never intended by its philosophical advocates to be synonymous with ‘mental’ and, consequently, much of what now goes by the name of ‘cognition’ in [cognitive science] is not really cognitive in the strict sense at all” (Green, 32). Although cognitive science “[has] since grown to include the study of some of these phenomena...one of the original aims of the cognitivist movement,” asserts Green, “was to re-introduce belief and desire into psychology, while still protecting it from the kinds of criticism that behaviorists had used to bring down full-blown mentalism²” (Green).

In what follows, I examine Green’s account concerning how the term “cognitive” became associated with aspects of the mental. After a brief presentation of his position, I argue that Green does not provide sufficient reason or evidence for acceptance of his claims and thus his proposal ought to be disregarded unless further evidence can be put forth in its defense. This paper is thus a preliminary effort to recapture the multiple meaning of the term “cognitive” in order to shed light on current conceptual work in cognitive science.

An Overview of Green’s Argument

Green first traces the origins of the word “cognitive” back to the ethical theories of the 20th century. By doing so, he introduces what he claims was the intended strict sense of the term “cognitive”: designating that which is “truth-evaluable.” Utilizing Green’s own words, we can construct the reasoning used to support his first premise:

- “Until the 20th century, ethicists...assumed that moral claims are truth-evaluable; i.e., that they express propositions that are either true or false” (32).

- “By the 1930s, however, even the modest assumption that moral claims are true or false came under attack by a group of philosophers...known as “noncognitivists” (32).

“It is raining outside in London”; “I am feeling sad”; “3 + 3 = 6”. Examples of non-truth-evaluable assertions include: “Why is it raining in London?”; “Why are you feeling sad?”; “Good God!”

² “Mentalism” refers to the scientific practice that focused on mental perception and thought processes as causes of behavior. Behaviorist such as B.F. Skinner argued that mentalistic explanations, i.e. those that appeal to mental objects and events, couldn’t suffice for a science of behavior (Baum & Heath 1992).

¹ That which is *truth-evaluable* is a statement that something is or is not the case. Examples of truth-evaluable assertions include:

- “Noncognitive ethicists believed that moral claims are not about matters of fact...there is nothing—natural or otherwise—of them to be true or false of” (32).

- “Thus, by contrast, the term “cognitive” denotes statements that are either true or false” (33).

- “‘Cognitive’ [here] is not in any way synonymous with ‘psychological’ or ‘mental’” (33).

- “The non-psychological usage [of the ‘cognitive’] is in line...with Gottlob Frege’s use of the term “thought” (33).

Green’s first premise, is fairly straightforward:

Premise 1: “Cognitive” in 20th century ethics designated that which is “truth-evaluable”; the term is devoid of any reference to the “mental.”

Next, Green demonstrates how the term “cognitive” in the strict sense—designating that which is truth-evaluable—was passed along from ethics to philosophy of science, and ultimately to the cognitive revolution rising in philosophical psychology, computer science, and linguistics:

- “Members of both the Vienna Circle...and the Berlin Society for Empirical Philosophy...talked of meaningful claims as having “cognitive significance...” (33).

- “Hempel (1951) put the matter most succinctly:

‘It is a basic principle of contemporary empiricism that a sentence makes a cognitively significant assertion, and thus can be said to be either true or false...(p. 61)’” (33).

- “‘Cognitive’ in this context carries with it no particularly psychological connotations; it is...a way of folding both logical and empirical significance into a single term” (33).

- “When [the philosophical psychologists of the 1950s and 1960s] first began to talk of the ‘cognitive’ there can be little doubt that they meant to separate those aspects of the ‘mental’ that are truth-evaluable—viz., the ‘propositional attitudes’ (e.g., beliefs, desires, etc.)—from those that are not (e.g., emotion, consciousness, qualia, imagery)” (34).

- “To avoid a repeat of the debacles [concerning mentalist psychologies of the late 19th and early 20th centuries (viz., structuralism and some forms of phenomenology), when the term “cognitive” started being (re)introduced into...philosophical psychology in the 1960s, only those parts of the mental that could be subjected to rigorous (logical, scientific) analysis [i.e. those which are cognitive]...were welcomed back...” (34).

The above statements support Green’s second and third premises:

Premise 2: The strict sense of the term “cognitive”—designating that which is truth-evaluable—was passed along from ethics to philosophy of science.

Premise 3: The strict sense of the term “cognitive” made its way via the logical positivistic philosophy

of science of the 1930s and 1940s, into the philosophical psychology of the 1950s and 1960s in order to “disown scientifically troublesome aspects of the ‘mental’” (34).

Green then tells an intricate story of the *experimental* psychologists of the mid-20th century. *Their* adoption of the loose sense of the term cognitive, Green claims, was *independent* from that of the philosophical psychologists of the 1950s and the 1960s who were associated with the cognitive revolution/the rise of cognitivism:

- “Cognition simply was not much of a going concern in psychology before the 1950s...‘thinking’ was the preferred term during the first half of the 20th century” (35).

- “Cognition was becoming an important topic in Festinger’s (1957) theory of cognitive dissonance and Heider’s (1958) theory of cognitive balance, as well as in Asch’s (1952) social psychology text...the exact meaning of cognitive varied somewhat among these theorists” (35).

- “About the same time [the information processing approach advanced by people like George Miller] was forming in psychology that would gravitate around the term ‘cognitive’...it seems, that ‘cognitive’ was adopted primarily as a trendy new way of saying ‘mental’” (37).

- “Whereas the strict use of “cognitive” was intended to keep the behaviorist criticisms of early-century mentalism, its loose use in psychology returned us to precisely these” (37).

The above list support’s Green’s fourth and fifth premises, as well as his conclusion:

Premise 4: As experimental psychologists became increasingly interested in thinking, language, and memory, the strict sense of the term “cognitive” began to merge with its loose sense being anything broadly regarded as “mental” employed by social psychologists.

Premise 5: The strict sense of the “cognitive” never took hold in psychology, and, consequently, psychologists now refer to the cognitive in the loose sense.

Conclusion: The rise of cognitivism has not been, nor was it ever intended to be, a wholesale return to the mentalism of the past and, consequently, much of what now goes by the name of “cognition” in cognitive science is not really “cognitive” in the strict sense at all.

Problems with Green’s Argument

Having provided a matter-of-fact reading of Green’s argument, I now systematically evaluate his argument based on the premises, reasons, and evidence he has selected, and how effectively he has used them.

Premise 1

Let us begin with the first part of Premise 1, viz. “‘Cognitive’ in 20th Century ethical literature designated that which is truth-evaluable.” Green supports this claim by providing several examples of emerging groups of ethicists known as “noncognitivists” whose ethical theories “were all premised on the belief that moral claims are neither true nor false. Thus, by contrast, the term ‘cognitive’ denotes statements that are either true or false” (Green 1997).

It is uncontroversial that noncognitivism as correctly described by Green was an important wing in 20th century ethics. One issue, however, is with Green’s inference of the meaning of the term “cognitive” by contrast with the term “noncognitive.” While the term *cognitive*, by logical contrast from the definition of “noncognitive” would be “statements that are either true or false,” it does not follow that “cognitive” in 20th century ethical literature *did* in fact designate that which is truth-evaluable. It is entirely possible that while “noncognitive” held this particular meaning, the word *cognitive* meant something entirely different (perhaps related to the mental), or that it wasn’t in fact used at all. An inference by contrast simply isn’t sufficient to demonstrate that the term “cognitive” in fact derived *from* the ethical theories of the 20th century. Primary or secondary source material would help buttress the claim that the “cognitive” was alive and well during this time beyond just inferring its place in history by contrast with a similar-seeming word.

The second half of Premise 1, viz., “the term is devoid of any reference to the ‘mental’” is equally troubling. Given that we don’t have compelling evidence to conclude that “cognitive” in the 20th century ethics *did* in fact mean “that which is truth evaluable” (via Green’s inference by contrast), it is difficult to get behind the claim that the term is in fact devoid of any reference to the mental. *Green’s* interpretation of “cognitive” in the ethical theories does not include anything related to the mental. But the fact that one’s own definition meets one’s own criteria is circular.

Nevertheless, Green posits that such a non-psychological usage is reasonable as it aligns with one prominent philosopher Gottlob Frege’s use of the term “thought.” Utilizing a secondary source, Green suggests, “the goal of philosophy, for Frege, was the analysis of the structure of thought, and few thinkers have been more influential on 20th century Anglo-American philosophy than Frege. The study of thought, however, was to be sharply distinguished from the psychological process of thinking” (Green). In other words, Green is essentially arguing that insofar as *one* influential philosopher distinguishes between the study of mental-seeming concepts (e.g. “thought”) and the study of the enaction of those concepts (e.g. thinking), that this supports the notion that the term “cognitive” is in fact devoid of any reference to the mental. While it is certainly plausible that the term “cognitive” was used in a non-psychological fashion, Green’s Frege example hardly counts as sufficient evidence that supports this connection.

Premise 2

Green’s second premise, that the term “cognitive” was passed from ethics to philosophy of science, is supported by a correlation. Prior to his second premise, Green attempts to establish that the term “cognitive” emerged in 20th century ethics to designate “that which is truth-evaluable.” Green then provides primary source evidence that the term “cognitive” was utilized by logical positivists such as Rudolph Carnap, Herbert, Feigl, Carl Hempel, and Hans Reichenbach to also mean “that which is truth-evaluable.” Insofar as 20th century ethics and logical positivistic philosophy of science utilized the term “cognitive” in the same way, this correlation suggests that “cognitive” transferred from ethics to philosophy of science.

Clearly, indirect evidence will not suffice. In order to support Premise 2, Green needs to provide direct primary source evidence that indicates the logical positivists indeed adopted the term from the ethical theorists of the early 20th century. Did Carnap or Hempel cite the works of 20th century ethicists? Were any logical positivists also active in the area of ethics? Were the logical positivists reacting in any way to the ethical literature of the time? These are important questions to ask.

Additionally, it is apparent that Green’s arbitrary starting point of “20th century ethics” as a place to look for the origin of the word “cognitive” requires an explanation. Why this particular time? What is so significant about the ethical theories of the 20th century’s usage that one would not be inclined to look further back? A recent article by library scientist Daniel W. Chaney titled “An Overview of the First Use of the Terms *Cognition* and *Behavior*” traced the use of both “cognition” and “behavior” and their variants back to the middle-ages, and considered how the terms were first used in the literature (Chaney 2013). A straightforward search of the *Oxford English Dictionary* yielded 79 terms identified as a part of the cognition family. More important, the term “cognitive” was traced back to 1586, with an initial definition, “of, or pertaining to cognition, or the action or process of knowing; having the attribute of cognizing.” “Cognition” was traced back to 1447, with an initial definition “the action or faculty of knowing; knowledge, consciousness; acquaintance with a subject” (Chaney 2013).

Chaney’s article was published well after Green’s paper, and thus was not available to Green at the time. Nevertheless, it seems reasonable that Green should explain: “why 20th century ethics?” and “why not look farther back when you clearly can?” Additionally, these initial definitions of “cognitive” and “cognition” most certainly do not exclude any particular reference to the mental (and in the case of “cognition,” may imply one with the reference to consciousness). Thus, a vital question for Green is, “if cognitive came from ‘noncognitive,’ where did the word ‘noncognitive’ come from, anyway?”

Premise 3

As with Premise 1, we may take Premise 3 piecemeal. First is the notion that “cognitive” made its way via the logical

positivistic philosophy of science of the 1930s and 1940s, into the philosophical psychology of the 1950s and 1960s. Below is the sole evidence Green provides for this claim:

"In this stew of logical positivism and its descendent philosophies of science were steeped the philosophical psychologists of the 1950s and 1960s who would play crucial roles in the development of contemporary cognitive science: U. T. Place (1956), R. M. Chisholm (1963), Wilfred Sellars (& Chisholm, 1958), D. M. Armstrong (1968), Hillary Putnam (1960/1975), Jerry Fodor (1968, 1975, 1980), etc. When they first began to talk of the "cognitive" there can be little doubt that they meant to separate those aspects of the "mental" that are truth-evaluable-viz., the "propositional attitudes" (e.g., beliefs, desires, etc.)-from those that are not (e.g., emotion, consciousness, qualia, imagery)." (Green, p. 34)

We may grant that the philosophical psychologists of whom Green cites have no doubt played pivotal roles in the materialization of cognitive science proper. The claim regarding their particular *intentions* and use of the term "cognitive," however, it not so well founded. One would expect Green to provide at minimum some primary or even secondary source evidence that Armstrong, Putnam, Fodor, et al. utilized and *intended* to utilize the term "cognitive" in the strict sense. Unfortunately, Green provides *no* such historical evidence, and instead offers several paragraphs explaining why the distinction between the study of "truth-evaluable" mental aspects and non-truth-evaluable mental aspects is so important. But whether such a distinction *is* important is an entirely different question than whether it *was* important to the philosophical psychologists at the time. The latter is the question Green claims yet ultimately fails to answer. Green needs to go beyond reassuring us that "there can be little doubt..." and actually provide evidence that philosophical psychologists did in fact adopt the term "cognitive" in the strict sense from the logical positivists.

To support the second part of his third premise "...in order to disown scientifically troublesome aspects of the "mental" during the rise of cognitivism," Green once again relies on indirect evidence to substantiate his claim. Green suggests that those aspects of mental life that are not truth-evaluable were key elements in the mentalist psychologies of the late 19th and 20th centuries (e.g. structuralism, some forms of phenomenology) (Green). Green points out that such approaches had difficulty in gaining acceptance and ultimately lead to behaviorists rejecting the study of the mental in favor of that which could be observed. Green then claims that in order to avoid a similar scenario during the rise of cognitivism, when the term "cognitive" started being reintroduced into philosophical psychology in the 1960's, only those "truth-evaluable" parts of the mental were welcomed back, while other aspects of the mental (i.e. noncognitive, mentalism-stuff) were excluded (Green). His reasoning is that since philosophical psychologists were interested in belief-desire psychology (i.e. that which is truth-evaluable) and behaviorists rejected all that was not truth-evaluable (i.e. anything mental), then the philosophical psychologists *must have also* intended to safeguard cognitivism from the problems of mentalism's past by asserting "cognitive" to mean "truth-evaluable." Once

again, Green leaves us only with indirect evidence and without substantial direct evidence to entertain this claim.

Green attempts to salvage some credence that philosophical psychologists preferred the term "cognitive" in the strict sense by offering some Fodorian viewpoints. Green quotes Fodor about his thoughts on consciousness (i.e. his thoughts on noncognitive mental stuff), referring to when Fodor says, "Nobody has the slightest idea how anything material could be conscious. Nobody ever knows what it would be like to have the slightest idea about how anything material could be conscious. So much for the philosophy of consciousness" (Fodor 1992). Green also notes that Fodor's primary research interests were in the study of the mental instantiation of proposition attitudes (i.e. the aspect of the mental that is most susceptible to logical analyses). Thus, Green argues that "we see the explicit separation, in the mind of at least one prominent philosophical psychologists, between what is to count as a topic of a cognitive science (viz., propositional attitudes), and what, for all its historical importance, is to count as a topic in the philosophy of mind that is outside of cognitive science proper (viz., consciousness)" (Green 1997).

But is such an explicit separation truly apparent? Fodor is a prominent philosophical psychologist. He is not interested in consciousness. His research interests are in belief-desire psychology. Knowing all of this, however, does not entail us to conclude that there was a specific intention on behalf of Fodor, let alone on behalf of *all* prominent philosophical psychologists of disowning troubling aspects of the "mental." In order to demonstrate such an intention, Green needs to actually connect the dots in his story. To do so, Green needs to show how Fodor's research interest and distaste for consciousness studies were in some capacity guided or representative of the particular value of the strict sense of the "cognitive," which he (as well as others) intended upon cognitive science proper.

Premise 4

Let us take Green's fourth premise step-by-step. In order to assert that, "...experimental psychologists became increasingly interested in thinking, language, and memory," Green attempts to show that cognition simply was not much of a going concern in psychology before the 1950s. In other words, Green sets the stage for psychologists to *become* interested in cognition. He does so by citing subject heading data from the *Cumulative Subject Index of Psychological Abstracts* from 1927-1960, where the term "cognition" is ultimately cited substantially less than such terms as "behavior" or "thinking." He thus uses this particular data to support his claim that "cognition" was not a going term or interest in psychology during that time.

Unfortunately, Green's use of the data leaves us wondering: how in fact do his quantitative tidbits really connect us to the actual history? Just citing the data doesn't really make his point clear. Green instead needs to make the connections explicit through further analyses. Given that there is a negative correlation with the use of the term

“cognition” during that time period, Green needs to explain those connections. Of which journals are the abstracts published? How did the authors in those journals actually use the term “cognition”? Green also needs to look at the actual experiments being conducted in those articles, and trace those connections from experiment to experiment. Better yet, why not run the data analyses on abstracts published in the journals of *philosophical psychology*? Where is *that* data set and subsequent analyses?

For the second part of the premise (viz., “the strict sense of the term ‘cognitive’ began to merge with its loose sense, being ‘anything broadly regarded as ‘mental’ employed by social psychologists”), Green provides several examples of social psychologists as well as those researchers from the “information processing approach” (e.g. Newell & Simon) who began to use the term “cognitive.” Such individuals, Green claims, “adopt[ed] a general view of cognition as pertaining to knowledge, without recognizing either the crucial distinction between knowledge and belief, or the theoretically important criterion of truth-evaluability” (Green). For example, on Solomon Asch’s writings on “cognitive basis,” Green explains, “the issue of truth-evaluability, although perhaps implicit in Asch’s thought about cognition, was never thought by him to be a strict criterion of the cognitive” (Green).

Green does an adequate job of attempting to evaluate what these particular researchers could mean by the term “cognitive” (since, according to Green, they fail to ever say so explicitly). He even manages to find a quote from George Miller on the adoption of the term cognition, in which Miller states, “In using the word ‘cognition’ we were setting ourselves off from behaviorism. We wanted something mental—but “mental psychology” seemed terribly redundant...we chose ‘cognitive’” (Baars 1986).

The problem, however, is Green’s use of the *absence* of the issue of “truth evaluability” in these particular instances of the term “cognitive” to support the claim that “the strict sense of the term cognitive began to merge with its loose sense...”. Asch, Festinger, and Newell & Simon do not mention anything about truth-evaluability in their descriptions of the cognitive. But they also fail to mention anything about pink elephants in their descriptions as well. On this reasoning, can we claim that “the wacky sense of the term ‘cognitive,’ being ‘that which relates to a pink elephants’ began to merge with its loose sense, being ‘anything broadly regarded as mental...’”? Of course not. All we can claim is something like “particular conceptions of the ‘cognitive’ among social psychologists were mute on the issue of truth-evaluability.” In order to make the stronger claim that the strict sense *merged* with the loose sense, Green needs to do a better job explaining: 1) the clear disconnect and/or disregard social psychologists had toward philosophical psychologist’s conception of the cognitive, 2) why “the strict sense” of the cognitive did not carry over, and 3) whether there was any discussion between social psychologists and philosophical psychologists on the use and/or misuse of the term “cognitive” at the time.

Premise 5

Green’s fifth premise is a consequence of the 4th, viz., “the strict sense of the ‘cognitive’ never took hold in psychology, and, consequently, psychologists now refer to the cognitive in the loose sense.” The issue with this premise is the way it is worded. The premise begs the question, i.e. it assumes that 1) there was in fact a strict sense of the “cognitive,” and 2) there was or should have been some maintenance of the strict sense of the term “cognitive” among experimental psychologists. Given that the bulk of these premises are of my own interpretation, one might think it just an issue with the paraphrasing. Green, however, directly states, “the strict sense never took hold in psychology,” which gives us reason to take issue with Green’s own wording.

Green would also do well to provide us an explanation as to why the strict sense of the term “cognitive” is in fact so significant. Green implicitly assumes that the term ‘cognitive’ in the strict sense is the “correct” way, and the fact that social psychologists opted for the loose sense of the term was an error. For example, Green claims, “the term ‘cognitive’ is not really ambiguous; that it has, in fact, a quite rigorous definition.” Well, yes, it *does* have a “rigorous” definition via the strict sense (or so Green claims)—but is that *the* only definition we should care about? And even if the strict sense of the cognitive came prior to the loose sense, why does Green present his claims as if the strict sense was intended for psychology?

Green’s Conclusion

Green concludes that “contrary to the supposition of many who have opposed it, the rise of cognitivism has not been, nor was it ever intended to be, a wholesale return to the mentalism of the past...” This assumes that cognitivism was thought to be a full-blown return to mentalism. But when have people thought this? Where is the *evidence* that people thought this? To support this conclusion, Green needs to provide primary as well as secondary-source evidence.

Lastly, what is considerably lacking is an answer to the all-important question: why do we care? Green claims, “[it] is important to understand what the motivations for the cognitive revolution, as it developed outside the bounds of university psychology departments, were—exactly which problems it was thought to solve and which problems it was thought to simply leave behind—especially since we seem, once again, to be running into difficulties on the very issues that led us to abandon mentalism in favor of behaviorism, now almost a century ago” (Green 38). But what are these difficulties? Why are they important? These questions are unfortunately left unanswered.

Conclusion

In this paper, I have critically examined Green’s proposed philosophical history concerning how the term “cognitive” became associated with aspects of the mental. I have shown that Green has not provided sufficient reasons or evidence in support of his proposal. By evaluating Green’s claims, I

have sought to determine what future research is necessary to gain a better understanding of the conceptual history surrounding the original aims, intentions, and concerns of the so-called “cognitive revolution,” the origin and mark of the “cognitive,” as well as how the term “cognitive” has become polysemic in present-day discourse.

Where should we look for a more accurate account of the term “cognitive”? As one reviewer helpfully pointed out, there is plenty of historical material in which to engage. One could begin by reading any decent historical text featuring a history of cognitive science (e.g. Hearst’s *The First Century of Experimental Psychology* (1979), Gardner’s *The Mind’s New Science: A History of the Cognitive Revolution* (1987), Boden’s *Mind as Machine: A History of Cognitive Science* (2008). These and other such texts reference several of the original sources in an accessible context.

From the standpoint of psychology, a deeper search could begin with the seminal works of William James and John Dewey. Moving through the 20th century, important work can be found in developmental psychology (e.g. Piaget), intelligence testing (e.g. Binet, Yerkes, and Terman), and even the “behaviorists” (e.g. Pavlov, Skinner, Thorndike, Watson, and Guthrie). Of particular interest to cognitive scientists, behaviorist Clark Hull developed rigorous models of learning behaviors that dealt with “cognitive” processes that posited mental representations. And of course, one cannot discount Edward Tolman, the behavioral experimentalist and theorist who re(introduced) the key term in the *Psychological Review* (1948) with the paper titled, “Cognitive maps in rats and men.”

But the history of a term “is never solely a matter of etymology: the need for a new word is socially determined, right at the start, and any subsequent changes of denotation, as well as the cluster of connotations surrounding it, are also in response to demands from society. The word cannot be isolated from its historical background....” (Ross 1962). Thus, to gain a deeper understanding of the term “cognitive,” a constructive program should go beyond rereading primary sources and launch an historiographical investigation. Such an analysis should not take terms like “cognitive” to be an expression of some timeless defining feature of human nature, but instead should begin with the assumption that such terms are historically constructed objects (Danziger 1997). By appreciating that at different times and in different places the term “cognitive” and its derivations have been constructed and reconstructed in attempts to deal with different problems and to answer a variety of questions, such an analysis may avoid the “gross parochialism that elevates local and ephemeral concerns to the status of eternal verities” (Danziger 1997).

When psychologists-historians such as Green turn to the history of their subject, they often do so with a psychologist’s bias in favor of accounts centered on individuals. Such bias “is likely to exaggerate an already strong cultural tendency to interpret social and historical events in terms of actions, thoughts, and personalities of individuals” (Danziger 1997). But the term “cognitive” has

its own multifaceted history; it is the work of many thinkers and it informs the practice of large interdisciplinary communities. Therefore, an additional constraint on a constructive program is that it should not be written in terms of the history of individuals.

One final recommendation includes an analysis of the discourse from which the term “cognitive” derives its sense. This kind of analysis, utilized by historian of psychology Kurt Danziger, acknowledges that “single terms are always embedded in a network of semantic relationships from which they derive their meaning and significance.” According to Danziger (1997), “changes in the meaning of one term are not independent of changes in the meaning of others, and the significance of each term depends on the position it occupies in a larger whole that is best thought of as a *discursive formation*.” Thus, in a successful history of the “cognitive,” one must study the term as an element in these discursive formations.

Hopefully I have demonstrated that the story of the term “cognitive” still requires broader and vigorous discussion of both its historical background and current meanings. This is a challenging project that many might prefer to avoid. Much like the word “intelligence,” cognitive is a term that is widely and conveniently used to mean all sorts of things—from creative ideation to any computational or multi-synaptic brain process. There is still much to learn about the term “cognitive,” however, and, more generally, the serious efforts to develop a coherent science of what it means.

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