T. V. Moore's (1939) *Cognitive Psychology*

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Thomas Verner Moore published a book called *Cognitive Psychology* in 1939, almost 30 years before Neisser's (1967) more familiar and far more influential work. Although it covers most of the standard topics found in current cognitive psychology textbooks, and even anticipated several current trends, Moore's text is not cited by any of the major histories of the "cognitive revolution" or any current cognitive textbook. We provide a brief sketch of Moore's academic life and summarize several of his papers that are still cited. After describing the psychologies prevalent in 1939, we compare Moore's text with two contemporary works, Woodworth (1938) and McGeoch (1942). We conclude by comparing the older text with Neisser's and by offering several reasons why the book is virtually unknown.

Cognitive psychology differs from other areas of scientific psychology in that it loudly and proudly proclaims to have arisen out of a (largely bloodless) revolution. The very phrase "cognitive revolution" implies a fundamental change in theories and research into human thought and behavior and a complete overthrow of the previous way of thinking. As with most revolutions, the circumstances leading up to the cognitive revolution preceded the actual deed by many decades, and histories of cognitive psychology read like histories of political movements with discussions of the forces and events leading up to the revolt. Again, like so many political revolutions, there is some doubt as to the actual date that was the starting point of the revolutionary change, and there is even some question as to whether a true revolution occurred (see Leahey, 1992).

Historians often point to Noam Chomsky's (1959) critique of B. F. Skinner's (1957) *Verbal Behavior* or to George Miller's (1956) "The Magical Number Seven, Plus or Minus Two" as the opening "shots" fired in the revolution. The event that is most often taken as signifying the arrival of the field, however, is the publication of Ulric Neisser's (1967) *Cognitive Psychology*. Recognized immediately as a major work (Bruner, 1970), Neisser's book was a bold statement of the constructivist view of cognition and set forth a new research agenda, which is still being followed. Its influence was both profound and widespread, not only because of its content "but also because of its title" (Murray, 1995, p. ix). The title was taken as the name of the field and, in 1970, as the name of the field's own journal, *Cognitive Psychology*.

An earlier book of the same title was not nearly so influential and, in fact, is rarely cited. None of the major histories of cognitive psychology (e.g., Baars, 1986; Gard-

ner, 1985; Lachman, Lachman, & Butterfield, 1979) or any of the current undergraduate cognitive textbooks cite the work. Neisser himself was unaware of the earlier volume until a few years after his version was published; indeed, his title might have been different if he had known about the earlier work (Neisser, personal communication, June 1996). The purpose of this paper is to present an overview of Moore's (1939) *Cognitive Psychology*. After describing the main theoretical viewpoints of experimental psychology in the 1930s, we compare Moore's text with two contemporary works, Woodworth (1938) and McGeoch (1942). We then examine experimental psychology in the decade prior to the publication of Neisser's (1967) *Cognitive Psychology* and compare the two texts with current textbooks.

T. V. MOORE

Dom Thomas Verner Moore (1877–1969) studied psychology under both Wilhelm Wundt at Leipzig and Oswald Külpe at Munich (Roback, 1952). While at Leipzig, he was also influenced by Charles E. Spearman and, later, became one of the leading practitioners of factor analysis. Like many in his day, Moore had varied interests and studied medicine at Munich, eventually receiving an MD degree from Johns Hopkins. He moved to Catholic University to take over the psychology lab that had been founded there in 1891 by Edward A. Pace. Pace had received his doctorate under Wundt, and so Catholic University's lab was one of the early psychology laboratories in the U.S. with a direct link to Wundt. Of the laboratories founded by Wundt's students in the U.S., only those at Johns Hopkins (1883, but which closed down in 1887 and was not reestablished until 1903), Pennsylvania (1887), and Columbia (1890) were founded earlier; Cornell's was founded the same year (Sahakian, 1975, pp. 138–140, offers a list of all labs founded before 1900). Moore himself received his PhD from Catholic University in 1904. Today, Moore is probably best known for his earlier book, *Dynamic Psychology* (1924), for a subsequent text that went to two editions, *The Nature and Treatment*

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of *Mental Disorders* (1943, 1951), and for his work on imagery (e.g., Moore, 1910, 1915).

The topics that fascinated Moore in the early 1900s are surprisingly relevant and of interest to cognitive psychologists today. For example, Moore's (1904) dissertation, published in *Psychological Review Monograph Supplements*, was called "A Study of Reaction Time and Movement." He found that movement time, the time required to move a particular body part, was more consistent and less variable than reaction time, the time to begin the response. Furthermore, he found that the delay between a warning signal and the stimulus affected reaction times more than movement times, and he made a direct comparison between the presence and absence of a preparatory warning signal. Finally, when an intermittent sound was present, reaction times were greatly increased but movement times were largely unaffected. Although research in the areas of movement control and human factors is conducted with more precision today than was available to Moore, it asks many of the same questions that he asked in the beginning of the century.

Other papers by Moore that are still cited focus on imagery. In "The Process of Abstraction," Moore's central question is: "Is there or is there not a distinction between thought and imagery; and if so, in what sense is thought to be interpreted?" (Moore, 1910, p. 75). This research, according to Moore, benefited from discussions with both Edward L. Thorndike and Wundt. His conclusions were that there is a distinction: Imagery is unnecessary for thought, and thought—specifically concept formation—is the result of past experience. The experimental procedure involved presenting nonsense line drawings and asking the subjects to determine which element the drawings had in common. Of particular note to the current interest in the reconstructive nature of memory, Moore repeatedly found that, after the common element had been identified, the subjects were less accurate in reproducing each individual item. He documented a particular type of reconstructive error in an appendix: The verbal label, or association, given to an ambiguous figure can alter the subsequent reproduction of the figure. This result was replicated by Carmichael, Hogan, and Walter (1932), a study that is frequently cited but that does not cite Moore's work.

In another study, "The Temporal Relations of Meaning and Imagery," Moore (1915) reported work done in Külpe's laboratory in Munich. In one condition, the subjects saw or heard words and were asked to respond as quickly as they could when they had "understood the word" or had "comprehended its significance" (p. 189). Essentially, this is a form of lexical decision task, because some of the stimuli were nonsense words, but the subject's response was more complex than a simple judgment of word or nonword. In another condition, subjects were asked to respond as quickly as they could when they had formed a visual image of the word. With the exception of one subject who had an extremely high false-alarm rate, all subjects responded more quickly to the meaning (viz., lexical decision) task than to the imagery

task. This finding tallies with more recent work on imagery (e.g., Paivio, 1971).

Unlike the 1904 and 1915 papers, a paper in 1919b was primarily based on introspection (though introspection also featured prominently in the 1915 paper). Even so, Moore did collect and report data that demonstrated better recall for objects than for pictures and better recall for pictures than for words. Again, this result is one that has been given more recent empirical support (Paivio, 1971).

Citations to Moore by experimental or cognitive psychologists usually concern his work on imagery. For example, Wickens and Engle (1970) and Kosslyn (1980) cite the 1915 paper, Paivio (1971) cites the 1915 and 1919b articles, Hall (1971) cites the 1919b paper, and Leeper's (1951) article on "Cognitive Processes" in Stevens's (1951) *Handbook of Experimental Psychology* includes references to the 1910 and 1919b reports. Woodworth (1938) cites the 1904, 1910, and 1919b articles, but McGeoch (1942) does not cite Moore at all.

Despite the prevalence of introspection in his work, which was not uncommon at that time, Moore was still fundamentally an experimental psychologist. His defense of laboratory techniques is still appropriate and would make a timely contribution to current debates (e.g., Banaji & Crowder, 1989). In Moore (1910), for example, he states:

It is very seldom, if at all, possible to reproduce in the laboratory the exact conditions of real life. Most of our experiments can only approximate more or less closely the actual occurrences in the external world. This is not, however, an insurmountable difficulty for the experimental psychology. We have not one mind for the laboratory and another for the world. The same mental processes that take place in the world are observed in the laboratory, but under different conditions. The change in conditions is in the direction of greater simplification. The mental process of the laboratory is, as it were, a purified product and its true properties can therefore be more easily determined. (p. 116)

This argument is similar to one later made by McGeoch and Irion (1952) about the difference between laboratory studies and those in the "real world": "Life in the laboratory is just as 'real' as life may be anywhere else. It is, however, more adequately controlled" (p. 8).

PSYCHOLOGY IN THE 1930s

One index of the relative influence of various schools of psychology may be derived from the entries in a book edited by Carl Murchison in 1930, *Psychologies of 1930*. Only four schools received multiple chapters: analytical psychology, behaviorism, structuralism, and Gestalt psychology. (One other school, Russian Psychology, also received multiple chapters, but is of little concern for the current topic. These entries concern either Pavlovian conditioning or such topics as "Psychology in the Light of Dialectic Materialism.") Functionalism was represented formally by one chapter (by Carr), although Woodworth's chapter entitled "Dynamic Psychology"

is really Columbia University's brand of functionalism (Boring, 1950).

Structuralism is often considered to be the first school of thought in psychology and had as its goal the understanding of the structure of the mind by analyzing perceptions into their constituent parts. Structuralists saw themselves as sort of chemists, trying to identify the essential elements of a percept in order to understand the elementary contents or structures of the human mind. In the 1930s, it was not really a school in the sense that Gestalt psychology and behaviorism were; the students of Titchener had at least four different viewpoints, represented by the four chapters in the Murchison (1930) volume. Indeed, instead of a heading of "Structuralism," Murchison opted for "Psychological Theories of Those Whose Training Background Was the Structuralism of E. B. Titchener." However, with the death of Titchener in 1927, the structuralist influence began to diminish (Bruner & Allport, 1940; Murray, 1988). In opposition to structuralism, or at least Titchener's viewpoint, were the functionalists (e.g., Angell, 1907; Carr, 1930). Functionalists believed that psychologists ought to study the process of thought rather than its contents. They did this by looking for functional relationships between a stimulus and a behavior. For functionalists, the key question to be answered was "What is the function or purpose of the behavioral act?" The functionalist movement continued to influence research through the prominent role of two institutions in particular, Columbia University and the University of Chicago. To anticipate, two students trained in these departments wrote major texts of experimental psychology at approximately the same time as Moore.

As influential as the functionalist movement was, the years immediately preceding and following the publication of Moore's text were dominated by behaviorism and Gestalt psychology, although the latter had far less influence in the U.S. than the former. Interestingly, both began within a year of each other: John B. Watson published his first major article on behaviorism in 1913 (Watson, 1913) and Max Wertheimer published a work on apparent movement in 1912 (cited in Murray, 1995).

Behaviorism did not take root until the mid-1920s (Samelson, 1981, 1985) and did not come to dominate experimental psychology in the U.S. until after 1930 (Murray, 1995). Behaviorism, as propounded by Watson, was both a methodological movement that rejected introspection and a substantive paradigm that emphasized the conditioned reflex as the foundation of behavior. As such, Watson stated that unobservable constructs, such as memory, imagery, and consciousness, could not be studied rigorously and thus were not appropriate topics for scientific study. Although the neobehaviorists who followed Watson may have departed more or less from his version of S-R psychology, they nonetheless continued to emphasize behavior and avoid mentalistic terminology. However, it should be remembered that even during the heyday of the behaviorists and neobehaviorists, there were some theorists who retained some mentalistic terms—most notably, Edward C. Tolman (e.g., Tolman, 1948).

The dominance of behaviorism in the U.S. is well documented, but two examples are noteworthy here. First, in a review of McGeoch's (1942) *Psychology of Human Learning*, Wolfle (1943, p. 352, emphasis in original) stressed the fact that McGeoch's work was restricted "to the field of *human* learning," an indication of how unusual and unexpected this was. The second example concerns both the rise in the use of animals as subjects and the decrease in studies of higher mental processes. Bruner and Allport (1940) reviewed all of the psychology articles that were published in the "leading" psychology journals until 1938. In the decade ending in 1908, only 4.1% of the articles published used animals as subjects, relative to 15.2% in 1938. Furthermore, even in those studies that used humans as subjects, the behaviorist viewpoint dictated which topics should be of interest. As Bruner and Allport (1940, p. 766) put it, "in light of the enormous importance of verbal behavior to all higher mental processes, the falling off of psychologists' interest—until 1938 only 6.1% of the total research output bears on higher mental processes involving language—is worthy of special note."

The other major movement in the 1930s, Gestalt psychology, began in Frankfurt in 1911 with a meeting of Max Wertheimer, Kurt Koffka, and Wolfgang Köhler (Ash, 1995). By 1933, all three held academic positions in the U.S., at the New School for Social Research, Swarthmore, and Smith College, respectively (Murray, 1988). Most of the original Gestalt writings are in German and many were published in *Psychologische Forschung*, founded in 1922 specifically by the Gestalt researchers. (Publication of the journal was suspended between 1939 and 1948; it has since been renamed *Psychological Research* and is now published in English.) Although most of the experimental research focused on perception, there were theories specifically applied to memory, thinking, and problem solving (see Ash, 1995; Murray, 1995). For example, George Katona published a book in 1940 in which Gestalt principles were applied to human learning. A review of Katona's book by Edwin Guthrie (1940) illustrates one behaviorist's negative view of this approach. Thus, texts like those by Katona (1940) and Koffka (1935) did not have much impact on experimental psychology in the U.S. as a whole and were not appreciated in this country until after behaviorism began to lose its grip (Murray, 1995).

CONTEMPORARY TEXTS

Several highly influential books were published within a few years of Moore (1939). In just one volume of *Psychological Bulletin*, there are reviews of both Hilgard and Marquis (1940) and Hull et al. (1940). Of more importance, Woodworth's (1938) *Experimental Psychology* was published just 1 year before Moore's text, and McGeoch's (1942) *Psychology of Human Learning* appeared just 3 years later. One reason for the lack of attention to Moore's book was its being sandwiched between the latter two enormously influential texts.

Robert S. Woodworth (1869–1962) received his PhD from Columbia in 1899 under James McKeen Cattell, who had received his PhD under Wundt in 1886. President of the American Psychological Association in 1915, Woodworth wrote several important books, including a text, *Psychology*, that went to five editions and outsold all other competitors for 25 years (Boring, 1950). His reputation and influence was such that, in 1939, his colleagues reprinted 25 of his papers on the occasion of his 70th birthday (Woodworth, 1939). Woodworth's (1938, p. iv) text is "rather voluminous and fairly comprehensive." It is a general experimental psychology text that covers all aspects of experimental psychology, including many chapters on both animal and human learning. Its basic orientation is "the functional school of psychology, in the broadest sense of the word" (p. v), and as such has only a "bit of theory" (p. 533). Usually, Woodworth is neutral with respect to various systems, focusing instead on data and experimentation. Thus, Woodworth's index contains entries for memory, and even imagery, but it does not contain an entry for consciousness. The scope of the text, and the completeness of its coverage, made it a standard for many years.

John A. McGeech (1897–1942) received his PhD in 1926 under Harvey A. Carr at Chicago. McGeech's early work was on eyewitness memory, particularly with children as his subjects, although he was also interested in memory for poetry and in studying emotion (Crowder, 1992). McGeech's 1932 paper, arguing that forgetting cannot in principle be explained by the passage of time, is still widely cited and highly relevant to current memory debates (see Neath, 1998, chap. 7). Another indicator of his lasting influence is the biographical entry in the *Encyclopedia of Learning and Memory* (Squire, 1992). McGeech's (1942) text was very warmly received (Wolfe, 1943) and was so successful that a subsequent edition, revised by Arthur L. Irion, was published in 1952 (McGeech & Irion, 1952). In both works, McGeech adopted an essentially atheoretical position, believing the study of learning and memory was not yet ready for elaborate theories (Crowder, 1992). Both editions were widely used as college texts.

THE COGNITIVE REVOLUTION

The beginning of the "cognitive revolution" has been given as September 11, 1956, when a group of prominent researchers gathered at MIT to attend the "Symposium on Information Theory." As George A. Miller put it,

I went away from the Symposium with a strong conviction, more intuitive than rational, that human experimental psychology, theoretical linguistics, and computer simulation of cognitive processes were all pieces of a larger whole, and that the future would see progressive elaboration and coordination of their shared concerns. (cited in Gardner, 1985, p. 29)

Of course, research on many of the topics currently seen as part of cognitive psychology had been conducted prior

to this time, usually in the verbal learning tradition, but several events occurred within a few years of 1956 to mark it as an important transition point.

In 1956, Miller published his famous paper on "Limits on Our Capacity for Processing Information." Two years later, Broadbent (1958) published a book relating perception and communication, borrowing terms and concepts from communications and engineering and portraying humans as information processors, particularly as processors with a limited capacity. In the field of linguistics, Chomsky (1957, 1959) demonstrated that behaviorism, particularly Skinner's approach, could not explain many aspects of language. Researchers came to realize that the study of language acquisition, comprehension, and production should be of central importance. In 1960, Miller and Jerome Bruner founded the Center for Cognitive Studies at Harvard.

Two other trends made this change possible. First, applied psychology, which declined in popularity between 1908 and 1938 (Bruner & Allport, 1940), made a huge comeback during and right after World War II (Lachman et al., 1979). Known variously as human factors, engineering psychology, and ergonomics, the goal was to design equipment based on the characteristics of a human operator. Because of the central role that the human played in the research, the subject was viewed as a communications channel and as a processor of information, similar to the equipment that was being designed. The technological achievements proved the assertion that information processing could be studied objectively and profitably in electronics and communication and supported a similar assertion for people. The second, related, trend was the development of computers and symbolic processing. In 1943, McCulloch and Pitts proposed that the brain could be approximated as a set of abstract neurons that could take one of two possible values, on or off. "Because of the 'all-or-none' character of nervous activity, neural events and the relations between them can be treated by means of propositional logic" (McCulloch & Pitts, 1943, p. 115). This view directly influenced John von Neumann's outline of the first modern digital computer and also that part of cognitive psychology that became cognitive science (Anderson & Hinton, 1989). This influence was already apparent in 1956 when Newell and Simon published a report about the first computer program for solving problems.

Finally, two other factors should be noted. Behaviorism did not disappear all in one instant but rather gave way to neobehaviorism (Leahey, 1992). The difference between the two lies in the acceptance by neobehaviorists of mediating unobservable mechanisms such as Hull's (1943) sHr. Here, although a particular cue or stimulus (s) will elicit a specific response (r) as in strict S-R psychology, habit strength (H) can function as a mediator and, depending on the organism's particular experience, can strengthen or weaken the relationship. Although quite different from the mentalistic concepts used by modern cognitive psychologists, hypothetical constructs such as habit strength did set a precedent for the reemergence of

theorizing about the unobservable (for an example concerning perception, see Garner, Hake, & Eriksen, 1956). The second factor is the relatively atheoretical approach to human learning and memory characterized by the verbal learning tradition (Lachman et al., 1979). With no vested interest in a current theory, it is easier to adopt a new one, especially if the new key concept, information (Attneave, 1959; Garner, 1962; Miller, 1956; Newell, Shaw, & Simon, 1958), had a respectable history in related fields.

Neisser's (1967) text followed these changes with a bold statement of how research and theory in cognitive psychology should develop. The fundamental concern became the study of how people go about "selecting, storing, recovering, combining, outputting, and generally manipulating" information (Neisser, 1967, p. 8).

COGNITIVE PSYCHOLOGY 1939 AND 1967

Both Moore (1939, p. v) and Neisser (1967, p. 4) have similar definitions of cognitive psychology: For Moore, "Cognitive psychology is that branch of general psychology which studies the way in which the human mind receives impressions from the external world and interprets the impressions thus received." For Neisser, cognition "refers to all the processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used." In both, the processes are fundamentally active, with an explicit statement that bottom-up processes by themselves cannot account for the myriad data. For example, on page 238, Moore (1939) argues that "past experience profoundly modifies future perceptions." On page 244, he states that "the ability to put together the items of experience into a unit whole and at the same time to hold apart the elements of this spatial and temporal manifold is a sensory function, for it is the construction of a total sensory impression." Nearly 100 pages later, on page 332, he states that "perception is not a passive reception of the picture of an object, but an active intellectual interpretation of a sensory presentation." Similarly, according to Neisser (1967),

the central assertion is that seeing, hearing, and remembering are all acts of construction, which may make more or less use of stimulus information depending on circumstances. The constructive processes are assumed to have two stages, of which the first is fast, crude, wholistic, and parallel while the second is deliberate, attentive, detailed, and sequential (p. 10).

A similar distinction can be found in Moore's discussion of attention (pp. 233–234) and visual perception (p. 327).

The most important difference is that whereas Neisser's text is forward looking, Moore's is far more conservative. In some respects, however, this conservative approach actually makes Moore's text more like current cognitive psychology than the cognitive psychology of 1967. For example, he includes sections on the biological bases of perception, such as detailed drawings of the brain (pp. 54, 63, 68), the ear (pp. 213–215), the eye

(p. 216), the olfactory apparatus (p. 220), and the tongue (p. 222). Related to this, and perhaps also due to the fact that Moore was an MD in addition to a PhD, Moore emphasized case studies of neurological impairment (pp. 55–73), including case studies in his sections on perception (pp. 251–258), reasoning (pp. 389–401), and memory (pp. 412–428). The deficits he selects are also more broad than those typically considered today, including not only visual and auditory problems but also patients with "tactual agnosia"—the inability to recognize objects by touch. Indeed, the idea that pathology can yield some insight into the nonimpaired cognitive system is a constant theme in this book. Moore cites numerous case studies of organic dysfunction and uses them to infer the dissociation between mental functions. For example, Moore determines that there is a difference between the power to store impressions and the power to recall impressions. He suggests that just because a person cannot recall something does not necessarily mean that the memory traces have been destroyed. Although the use of clinical populations in psychology articles declined from 1908 to 1938 (Bruner & Allport, 1940), there is a renewed interest today (e.g., Farah & McClelland, 1991; Martin, 1993).

Moore is like both turn-of-the-century researchers and current researchers in three other respects. His concern with consciousness not only reflects the intense interest in the topic around the turn of the century (Carr, 1930) but also anticipates the renewed current interest (e.g., Baars, 1988; Schacter, 1989). Part I of Moore's text, comprising 10 chapters, is entitled "Consciousness and the Nervous System." As a second example, Moore is largely a proponent of faculty psychology. As with other aspects of his book, this feature also showed a systematic decrease from 1908 to 1938 (Bruner & Allport, 1940) but has seen a recent resurgence (e.g., Fodor, 1983; Mattingly & Studdert-Kennedy, 1991; see especially Crowder, 1989, for a discussion of the resurgence of faculty psychology in the guise of modularity). One of Moore's central goals is the discovery and identification of the faculties, which he defines as "a specific power of performance, characteristic of the human mind, possessed by all normal human beings, but which in its actual operation may involve a number of organic mechanisms" (p. 238). His final chapter of Part VII is called "Mental Faculties and Factorial Analysis." One reason for the inclusion of this topic may be his close association with Spearman and his continued use of Spearman's latest statistical techniques (e.g., Moore, 1919a; Moore, 1939, pp. 590–604). A final example of how Moore (1939) both anticipated a current trend and reflected earlier considerations concerns cognitive science more than cognitive psychology. Early psychology, especially prior to the turn of the century, was essentially a branch of philosophy, both *de jure* and *de facto*. Within a few years, the two disciplines separated and became quite distinct. In Moore (1939), however, there remains an extended presentation of philosophical concerns, just as in current cognitive science

Table 1
The Tables of Contents From Moore (1939) and Neisser (1967)

Moore (1939) 604 pages	Neisser (1967) 305 pages
Part I: Consciousness and the nervous system	Chap. 1: The cognitive approach
Part II: Landmarks in the theory of perception	Chap. 2: Iconic storage and verbal coding
Part III: The psychology of perception	Chap. 3: Pattern recognition
Part IV: The pathology of perception	Chap. 4: Focal attention and figural synthesis
Part V: The human intellect (including Imagery, Judgment, and Reasoning)	Chap. 5: Words as visual patterns
Part VI: The psychology of memory (including recognition, sensory memory, intellectual memory, transfer, and recall)	Chap. 6: Visual memory
Part VII: The relation between body and mind	Chap. 7: Speech perception
	Chap. 8: Echoic memory and auditory attention
	Chap. 9: Active verbal memory
	Chap. 10: Sentences
	Chap. 11: A cognitive approach to memory and thought

philosophy plays a central role. In the 1960s, philosophy had relatively little impact on cognitive psychology.

Despite these conservative—or even backward-looking—characteristics, Moore's text also reflects several trends current or emerging in the 1930s. First, there was the increased use of statistics: By the decade ending in 1938, nearly half of all articles in the "leading" psychology journals included various "statistical aids" (Bruner & Allport, 1940). As mentioned above, Moore's final chapter of Part VII, "Mental Faculties and Factorial Analysis," includes a quite thorough presentation of some recent statistical advances by Spearman, and his sections on memory are similarly quite mathematical. A second example of a typical 1930s approach is the broader coverage of subject matter. In the tradition of Woodworth (1938), Moore discusses senses other than just vision and audition, including taste, smell, tactual, and kinesthetic experiences, and includes in some detail discussion of the psychology of time and the psychology of judgments, including causality. Third, the memory sections are quite similar to those of Woodworth (1938) and McGeoch (1942) in terms of both the type of data considered and the experimental preparations discussed. In particular, the deemphasis of animal learning makes Moore's treatment of memory and human learning very similar to McGeoch's. The two major differences are that, unlike McGeoch, Moore (1939, p. 445) does not believe that all forgetting is due to interference. A form of decay—"the tendency of memory traces to fade"—is still present in Moore's account of forgetting. Retroactive interference (or *inhibition*, as Moore terms it) is still given an entire chapter, however. The other difference is that whereas McGeoch deemphasized theory, Moore advocates a framework in which the person actively constructs and interprets information. This orientation is not an isolated statement but rather a systematic view used to frame his discussion of all aspects of cognitive psychology. This is clearly different from the behaviorist, Gestalt, psychophysical, and functional views dominant then. In Moore's framework, the perceiver plays a more active, cognitive role than in the constructivist views as they were formulated in the 1930s (Woodworth, Schlosberg, Kling, & Riggs, 1971).

Moore's cognitive book is not entirely unknown (e.g., Boring, 1950, p. 730; Hoffman & Deffenbacher, 1992; Schacter, Eich, & Tulving, 1978), but no current cogni-

tive textbook or history of cognitive psychology cites the book. What makes the omission of Moore's (1939) book all the more interesting is that, unlike other overlooked works, such as those of Richard Semon,¹ it was published in English by a major American publisher and is currently on the shelves of many major university libraries (e.g., Purdue University, Rice University, and Yale University). Indeed, it was reviewed quite positively in *Psychological Bulletin* (Kantor, 1940). Although Kantor (1940, p. 249) warned readers that the author "is a monk of the order of St. Benedict," the book "displays prominently the *nihil obstat* of the church authorities," and the work "is an orthodox scholastic production," he also stated that "this is a very competent textbook, excellently and sometimes poetically written." Nowhere in his review does Kantor comment on the title.

IS IT COGNITIVE?

One problem in contemporary evaluations of works from the past is the tendency to project current ideas and theories where there is really no basis and to overlook other aspects. This is particularly likely in a work such as Moore's, where his dynamic and Thomistic views are not as congenial to most cognitive psychologists as his constructivist position. There is also much in Moore (1939) that is now known to be factually incorrect; we have not felt compelled to point out these errors, however. Of more significance is whether Moore's (1939) text is really "cognitive" or whether he used an inappropriate label.

On one level, the book is clearly cognitive. Table 1 compares the tables of contents from both Moore's and Neisser's books, and there is a fair degree of overlap. Both present perception and attention before higher level processes, and both also mention sentence comprehension and memory (although, to be sure, in different proportions). As mentioned above, Moore also included many topics that were not in Neisser (1967) but that are included in current cognitive psychology textbooks of today.

If, however, one defines cognitive psychology as requiring the concept of information, the case for Moore (1939) is less clear cut. He did not have the concept available to him, even though he talks of "active intellectual interpretation" of stimuli (p. 332). What, in Moore's framework, is being transformed and interpreted? Es-

entially, rather than information, Moore emphasizes a form of energy within the nervous system, or neural activity. Although this is similar to connectionist and neural network approaches—and thus another example of something more in common with current cognitive psychology, especially cognitive neuroscience, than information processing psychology of the 1970s—Moore meant this to be taken literally and included many sections on physiology.

Neisser's (1967) *Cognitive Psychology* was truly a seminal book, and the fact that his title and some of his points of view were anticipated 28 years earlier do nothing to alter the importance of his contribution. It is important, however, to note historical antecedents, even if they are not widely cited, and Moore's (1939) book, despite its intellectual failure, is just such a historical precedent.

Although we do not recommend that everyone read this text, we do believe that certain sections should be of interest with respect to several different areas. First, the text is undoubtedly of interest to historians of psychology, particularly to those writing histories of cognitive psychology. Second, several sections concerning philosophy are recommended to researchers in both cognitive psychology and cognitive science, especially the extended discussion of Cartesian dualism. Gibson (1994, p. 70) has noted that dualism is becoming more common in current research, resulting in many articles and theories that implicitly or explicitly include a "ghost in the machine." Just as Gibson rejects dualism as not useful for psychology, so too did Moore. A third reason why researchers may be interested in small sections of the text is to see what the state of the knowledge was in their area of specialty some 60 years ago. Moore includes more German references, for example, than some other texts and also provides a lengthy history in each section (including not only ancient Greek sources but also many medieval and pre-19th century sources).

The reasons that Moore's (1939) book has been overlooked appear quite straightforward. First, Moore's text has two types of sections, those supporting church doctrine and those presenting and discussing cognitive phenomena. Although the former constitute a smaller portion of the book, "all factual evidences coordinate with the original scholastic premises" (Kantor, 1940, p. 249). True, this does not lead to a biased presentation of the empirical data; nonetheless, there is a far more overt discussion of a priori assumptions and premises than is usually found. This type of presentation also necessitated an extended discussion of consciousness, and, indeed, this is the first section of the book. Such an emphasis during a period in which behaviorism and neobehaviorism were dominant cannot have helped.

The second reason has already been mentioned above: Two profoundly influential books neatly sandwiched Moore's text, Woodworth in 1938 and McGeoch in 1942.

Finally, even if the sections on philosophy and consciousness are discounted, the intellectual time was not right for viewpoints in which the subject actively participated in the interpretation of stimuli (see also Murray, 1995, for a similar analysis with respect to Gestalt psy-

chology). Most American researchers were of either the behaviorist or the functionalist tradition; a book that gave so much emphasis to active internal processing could not fail to meet with disapproval. What most histories of cognitive psychology document is the change in attitude and approach reflected in Neisser's (1967, p. 5) book: "A generation ago, a book like this one would have needed at least a chapter of self-defense against the behaviorist position. Today, happily, the climate of opinion has changed, and little or no defense is necessary." Clearly, 30 years earlier, there was little chance that a cognitive book would have widespread influence in American experimental psychology, especially one such as Moore's (1939) *Cognitive Psychology*.

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NOTE

1. Semon's 1904 book *Die Mneme* was translated into English in 1921 as *The Mneme*, and his 1909 book *Die mnemischen Empfindungen* appeared as *Mnemic Psychology* in 1923 (Schacter et al., 1978).

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