Preface

Beginning in the 1950s, behaviorism gradually began to lose its dominant position in psychology as interest in consciousness research was revitalized. Unsatisfied with speculating on the interactions between environmental stimuli and behavioral responses, psychologists attempted to identify and better understand the internal mental structures mediating the stimulus-response process and its underlying mechanisms. Scholars soon realized that several mental structures and mechanisms governing human behavior are independent of consciousness and therefore cannot be studied through introspection and self-control. Further research eventually revealed that implicit cognition is, like explicit cognition, a common cognitive mechanism in humans. Furthermore, it was shown to be a fundamental and primary regulator whose functions could be performed by explicit cognitive mechanisms.

As a basic form of cognition, implicit cognition has various manifestations, including perception of subliminal stimuli, repetitive priming effects, unconscious learning, and rule generalization/abstraction. Implicit cognition is a hierarchical structural system that can both process surface features (e.g., stimuli) and extract the inherent laws of complex systems.

METHODOLOGICAL ISSUES WITH IMPLICIT MEASURES

Unconscious cognition has long been the subject of philosophical debate. Western psychoanalytic theory suggests that humans have a conscious and unconscious mind. The unconscious mind predominates; Freud likened it metaphorically to the part of the iceberg beneath the sea's surface (Schneider, 1993). Experimental study of unconscious cognition can be traced back to Ebbinghaus’s memory research. In 1885, Ebbinghaus classified memory into three categories, two associated with consciousness and one with unconscious memory. Ebbinghaus stated that forgotten experiences hidden from consciousness cannot be fully consciously recalled but can exert an important influence on the memory. Later, Thordike and McDougall et al. also described and classified unconscious memory, but for decades, most human cognition research was limited to conscious cognition. In the 1970s, Warrington et al.’s study of implicit memory in patients with amnesia and Reber et al.’s study on the implicit learning of artificial grammar inaugurated the systematic study of unconscious cognitive processes. Currently, it is generally believed that the unconscious cognitive paradigms include implicit memory, implicit learning, and automatic processing. Technological innovations have facilitated the development of scientific theories; as in other areas of psychology, the progress of implicit cognition research depends on the sophistication of its research methods. In particular, implicit cognition research has benefited from the gradual improvement of the indirect measurement methods used in implicit memory research. Implicit cognition
research methods based on the response time paradigm became popular among researchers due to their innovativeness. These methods were then employed to develop a series of research methods, including the Implicit Association Test (IAT) (Greenwald, McGhee, & Schwartz, 1998) and its variants and the priming paradigm and its variants. These response time paradigm-based research methods have been subjected to scrutiny and debate during their development; for example, the IAT has been challenged by the Quad Model (Conrey, Sherman, Gawronski, Hugenberg, & Groom, 2005) and the replicability of the priming paradigm has been brought into question (e.g. Doyen, Klein, Pichon, & Cleeremans, 2012; LeBel & Lorne, in press; Shanks, et al., 2013). Therefore, the effects of these research methods on the theoretical and practical applications of implicit cognition should be further explored.

Dentale, Vecchione, and Barbaranelli (Chapter 1) explore the results and validity of the IAT when used to assess the Big Five personality traits. They show that the five factors of personality are adequately assessed by the IAT and its variants, such as the questionnaire-based IAT. They also demonstrate that implicit measures of traits primarily reveal the stable inter-individual differences that predict actual behavior and should be distinguished conceptually from explicit measures of the Big Five. Moreover, implicit measures were found to be less prone to error than self-report measures. Christina Bermeitinger (Chapter 2) examines different types of priming and their features and principal elements using several organizing principles, including macro-, midi-, and micro-perspectives; type of dependent variable; and task. She summarizes several important theories of response priming, semantic priming, affective/evaluative priming, negative priming, and macro-level priming and discusses several general problems researchers encounter when applying priming methodologies. A brief overview is given.

**INDIVIDUAL DIFFERENCE, PROCESSING SKILLS, AND IMPLICIT LEARNING**

For decades, psychological research, dominated by cognitive psychology, has been expanding the scope of consciousness research, resulting in the development of new fields such as implicit learning. Prior to 1990, studies on individual differences primarily improved researchers’ understanding of independent implicit learning systems. The artificial grammar paradigm proposed that, in contrast to the large age difference observed in explicit learning capability, no differences were observed in the implicit learning capabilities of adults and children. This finding was confirmed by several later pathological and neuropsychological studies. These studies found that patients with Alzheimer’s disease and amnesia have impaired explicit learning abilities. However, their implicit learning abilities are less affected by their dysfunction or disorder, and they have the same capacity to learn complex rules as a healthy person (c.f., Machado, et al., 2009). In addition to age and neuropathological factors, intelligence also does not affect implicit learning (e.g., Kaufman, et al., 2010). These findings interested scholars, and a number of studies were subsequently conducted on a variety of variables, such as neuro-injury, age, and intelligence. Since the 1990s, in addition to continued exploration of the impact of factors such as age and intelligence, researchers have pursued the comprehensive analysis and theoretical construction of individual difference factors. According to Reber, implicit learning is a basic human learning system and a primitive knowledge acquisition mechanism, an adaptation mechanism preserved through long-term evolution and natural selection. Using the laws of evolution, he deduced that implicit learning is age-independent, highly stable, IQ-independent, and has lower individual variability than explicit learning. The hypothesis that implicit learning has lower individual variability than implicit learning. The hypothesis that implicit learning has lower individual variability has been confirmed by a number of studies, but not all studies have supported this hypothesis. Spurred by the dispute that ensued, Reber
suggested that the so-called “individual differences” resulted from other variables, “the differences that did not cause differences,” an assertion that appears to be reasonable (Reber, 1989; Reber & Allen, 2000). Meta-analyses have demonstrated that the discovery of individual differences is closely related to the methodology used. Multiple factors, such as conceptual approaches, experimental materials, and experimental paradigms, have a direct impact on the experimental results. Daisuke Nakamura (Chapter 3) reviews studies examining whether individual differences in psychometric intelligence, working memory, and other less investigated variables, such as emotion and personality, affect implicit learning. Nakamura particularly focuses on Reber’s evolutionary theory and Kaufman’s dual-process theory of implicit learning. This chapter concludes that the findings on the effects of these individual difference variables on implicit learning are, with the exception of psychometric intelligence, which is still inconclusive, and provides suggestions for future research.

From a theoretical perspective, research on implicit learning has provided new insights into the nature of human cognitive processes and has helped identify the psychological mechanisms underlying the processes used to acquire abundant and complex knowledge. It is imperative to develop a theoretical framework for understanding the thought processes associated with implicit cognitive vulnerability (Chapter 4). Therefore, the theoretical and modeling efforts in this section focus on theories of implicit memory, Bloom’s Taxonomy of the Cognitive Domain, and Anderson and Krathwohl’s Revised Taxonomy of the Cognitive Domain. The objectives of Chapter 4 are to develop an implicit cognitive framework that facilitates the advances in conception and understanding proposed by Bloom’s work and Anderson and Krathwohl’s revision. Several aspects of implicit cognitive vulnerability suggest the dissonance, resistance, fear, creativity, inspiration, and innovative effort associated with the increased exertion and shift in processing experienced by learners as they engage in cognitively focused higher order thinking skills.

SOCIAL COGNITIVE PERSPECTIVES ON ATTITUDES

Cognitive psychologists believe that most of the stimuli discussed in the socio-cognitive literature have social significance and thus lead to complex psychological reactions in participants. These stimuli can be either consistent with or in contradiction to the participants’ inherent needs or implicit attitudes. Due to differences in the social significance of the stimuli, the complexity of information processing varies among participants, resulting in different response times. In rapid response tasks, participants’ responses to the stimuli are not controlled consciously, and the observed social cognition can therefore be considered implicit. As mentioned earlier, IAT remains the most important measurement method. Although its theories and methodology remain in question, this method has been widely used in studies on various topics, including implicit attitude, ego, self-esteem, stereotypes, and so on. In addition, because of its flexibility in adopting different target and attribute concepts, this method can also be adapted to measure different aspects of implicit cognition. Chapter 5 presents the results of an audio IAT test, which support the incorporation of concepts and methods from Implicit Social Cognition (ISC) into language attitudes research. Measuring both implicit and explicit attitudes provides a more complete picture of reactions to foreign accented speech. Therefore, the integration of concepts and methods from the ISC domain can contribute significantly to language attitudes research.

Implicit attitudes have long been understood as unconscious traces accumulated from past experiences and attitudes. Such traces and their impact are beyond an individual’s conscious awareness, but they potentially affect one’s emotional orientation, awareness, and behavior towards a socio-object.
Therefore, exploration of implicit attitudes is undoubtedly crucial to understanding social behaviors or tendencies. Chapter 6 presents an empirical study that represents an important attempt into gaining a fuller understanding of the effects of stereotype threat on the implicit processes that may underlie performance and motivation in stereotyped domains. Kelso and Brody’s chapter indicates that implicit emotions often differ from self-reported emotions in meaningful ways that can inform the field’s understanding of stereotype threat.

Researchers have suggested that implicit attitudes guide automatic behavior, playing a pivotal role in the automatic processes involved in addictive behaviors. Chapter 7 analyzes the impact of implicit attitudes towards smoking, primarily by examining smoking behavior, to identify the factors that should be considered when investigating implicit attitudes toward smoking. The basic mechanisms underlying implicit attitudes are not well understood. Chapter 8 describes a new method whose functional approach toward implicit attitude research has the potential to clarify several outstanding issues. Within a functional framework, attitudes can be measured as histories of verbal behavior. Functionally oriented research into implicit attitude mechanisms has produced alternative testing methodologies.

THE ROLE OF IMPLICIT MECHANISMS IN SELF-ENHANCEMENT

Since James’s (1890) proposal of the concept of ego and division of the ego into the “empirical ego” and “pure ego,” the ego has been vigorously researched by psychologists. Similar to learning and attitude, self-motive is divided into two types: implicit motive and explicit motive. Explicit self-motive is a cognitive representation of personal values derived from conscious thinking and is relatively well controlled. Explicit self-motive can be developed through speech-transmission-based socialization experiences and is determined by conscious choices made after careful consideration. The concept of implicit self-motive falls under the purview of implicit self-evaluation. Implicit self-motive is a result of self-communication that occurs during unconscious and relatively uncontrolled excessive learning. In other words, implicit self-evaluation is developed in the absence of introspection. Self-enhancement is a common motive. Individuals tend to use more positive words to describe themselves and typically believe that they possess more positive personality traits than others. Self-enhancement is developed through speech-transmission-based socialization experiences and can be inferred by observing spontaneous or habitual responses. Thus, individuals’ unconscious positive attitudes towards themselves or the display of such attitudes during automatic processing are considered instances of implicit self-enhancement. Chapter 9 reviews the evidence on unconscious goal pursuit, autobiographical memory, social neuroscience, and implicit self-esteem that suggests that implicit mechanisms play a significant role in producing self-enhancement outcomes. This chapter also reviews evidence that implicit mechanisms are activated by social threats and thus contribute to successful coping. The implications of implicit self-enhancement mechanisms for targets of stigma, who frequently encounter threats to their well-being, are discussed in this chapter.

TACIT KNOWLEDGE AND EDUCATIONAL TECHNOLOGY

As an important component of implicit cognitive processes, tacit knowledge is, like implicit memory and implicit learning, implicit (Reber, 1989). From an information-processing perspective, implicit memory does not require intentional recall, and implicit knowledge tasks can be automatically affected by an
individual’s past experience. Implicit learning is associated with unconscious learning processes, while implicit knowledge is more closely associated with the products or outcomes of learning. As Polanyi suggests, explicit knowledge can be fully expressed through human symbol systems. In contrast, implicit knowledge refers to knowledge maintained in the mind but not readily articulated. In this Information Age, computer network-centered information technology is changing the way people access knowledge. Implicit knowledge acquisition requires a free and open environment; depending on the scenario, learners engage in implicit knowledge construction through collaboration and communication during the problem-solving process. Chapter 10 explores how social factors influence implicit knowledge construction on the Internet. Albena Antonova analyzes implicit knowledge construction theories in the context of Internet communication. More specifically, she analyzes how the Internet increases the impact of social factors on implicit knowledge construction.

From a practical perspective, the theories and methods used to study implicit learning have been applied in various fields, including advertising, social interaction, economics, and management. The outcomes of implicit learning are more effective than those of explicit learning, raising the question of whether implicit learning has positive implications for education. I believe that concepts such as Bloom’s taxonomy (also mentioned in Chapter 4), for example, have had an extensive and profound effect on classroom teaching practices in Mainland China. Bloom’s taxonomy divides classroom educational objectives into six levels. In its implementation of the taxonomy, China’s Ministry of Education has modified the definitions of the six levels. “Comprehension,” the second-most basic educational objective, is generally considered accomplished when the learner can understand the meaning of the knowledge or material and can convert, interpret, and infer from the acquired knowledge in his or her own language. This definition clearly excludes the possibility of implicit learning. In such a scientism-oriented educational paradigm, the concept of “comprehension” is absolutely rational, and logical thinking is assumed to prevail in the mental processes. Therefore, general education institutions struggle to increase students’ true understanding of the world. According to the theory of implicit learning, during the teaching process, especially when teaching scientific principles, it is unnecessary to force students to intentionally learn the presented material; instead, it is more important to ensure that they understand the meaning and significance of natural laws by engaging in appropriate practice. This viewpoint is consistent those discussed in Chapter 11. Jančec, Vorkapić, and Vodopivec argue that the influence of the hidden curriculum and implicit learning deserve increased attention and scientific research because of their significant contribution to learning outcomes and their constant presence in the education process: in a learning environment, they are present all the time and for all the participants.

We believe that the theory of implicit cognition can provide a theoretical foundation for the development of educational information technologies. Implicit knowledge acquisition requires an informal learning environment. Because of its situationality, interactivity, and convenient management tools, an Internet-based virtual learning environment supports the conversion of implicit knowledge into explicit knowledge, and an individual’s construction of implicit knowledge. Chapter 12 presents a literature review of the most reliable contemporary socio-cognitive learning theories and models (e.g., the Innovative Behavioral Model) developed in the early 21st century. These socio-cognitive constructs reinforce the majority of students’ collaborative social-cultural pursuits and capabilities in the learning process. A novel framework for implementing collaborative processes through 3D multi-user virtual worlds is proposed in this chapter.
CONCLUSION

This book provides a meaningful research tool by describing new ideas and the latest achievements in the field of implicit cognition. It is a convenient reference for undergraduates, graduate students, and educational researchers engaging in cognitive and social psychological research and also provides useful information for those interested in implicit cognition.

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REFERENCES


