

Implicit Learning and Its Application in Foreign Language Learning

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ABSTRACT

In recent years, implicit learning theory has been one of the focuses of cognitive psychology research, and foreign language learning has important enlightening significance. This article aims to introduce implicit learning and its characteristics, and on this basis, discuss the application of implicit learning in foreign language learning.

Keywords: Implicit Learning, Foreign Language Learning, Application

1. INTRODUCTION

There is a consensus among people to conclude that native speakers rarely make grammatical errors in everyday communication, even though they do not know or cannot clearly express the grammatical rules they are following. The acquisition of the mother tongue is proof of the existence of a special form of learning, namely implicit learning. Another proof of it is the understanding of music. People can distinguish between styles of music (for example, rock from classical), although they have no expertise of it. With massive repetitions, one can master a motor act such as standing. The phenomenon is also based on implicit learning.

This article compares implicit learning and explicit learning by introducing related theories, categories, and characteristics of implicit learning, and on this basis, discuss the application of implicit learning in foreign language learning to better promote foreign language learning.

2. IMPLICIT LEARNING – THEORY

Implicit learning is the counterpart of explicit learning. The American psychologist A.S.Reber differentiated the two fundamentally different forms of learning by using the term “implicit learning” for the first time in his article “Implicit Learning of Artificial Grammars” in 1965. Great attention is drawn to the form of learning. Research interest in implicit learning has increased significantly in recent decades. “Implicit learning” means special forms of learning that take place without the involvement of the conscious mind and often take place casually and without a specific learning intention. Compared to explicit learning, the implicit learning processes occur

unconsciously and often without an explicit learning intention, so that learning can take place immediately and without effort. It represents a new revolutionary learning method. Since the 1960s, numerous scientists, psychologists, educators have dealt with implicit learning. A great deal of evidence for the existence of implicit learning has been found.

2.1 Definitions

In the development process in which mankind tries to adapt to the constantly changing environment, it unconsciously acquires knowledge about the environment and the skills. Such learning processes that happen unconscious are called implicit learning. The first mention of implicit learning was likely in 1965 by the American psychologist Arthur S. Reber. In his article “Implicit Learning of Artificial Grammars” he distinguished for the first time between implicit and explicit learning. In his further work, the American tried to research what can be learned implicitly. Scientific research began in the late 1960s. In the beginning, the researchers encountered many problems. Among the problems, a common definition of implicit learning and the interaction between implicit and explicit learning are considered to be the most important and decisive. Some representative definitions of implicit learning are presented below.

Through numerous experiments, Reber comes to the conclusion that implicit learning is an unconscious acquisition process of complicated knowledge. People are not aware of the fact that in this process they follow certain rules. Nor can they verbally express the specific rules. However, they act according to the rules.

In Lewicki's eyes, implicit learning refers to the process of acquiring specific knowledge and motor skills.[1] And

it is crucial that the learning process is not accessible to consciousness. Man cannot clearly explain how he does it, even if he has mastered the skills. In some cases, one does not even know that he has already acquired the knowledge or mastered the skills.

Cleeremans and Jimenez argue that if the knowledge is acquired without intentional learning and can implicitly influence behavior, then it is implicit learning.[2]

The above descriptions of implicit learning have shown that researchers today have accepted the existence of implicit learning, they fail to find a uniform definition for it. The reason is that implicit learning is a multifaceted phenomenon, the complexity of which makes it difficult to define. The researchers observed implicit learning from different perspectives and resulted in different definitions. When defining implicit learning, the researchers argued about the distinction between the pairs of terms "non-intentional" versus "unconscious" and "inattentive" versus "automatic". The decisive criterion for implicit learning is the lack of awareness in the learning process, not the intention to learn. And implicit learning happens automatically. If the two properties are taken into account, "implicit learning means the forms of learning which take place automatically without the involvement of the consciousness and which often (but not always) occur casually and without specific learning intention." [3]

There are several thematically related terms that are used as synonyms of implicit learning.

Latent learning describes learning processes without accompanying execution. The word "latent" does not refer to consciousness but to behavior.[4] If there is reinforcement, the latently acquired knowledge is only expressed in behavior. And the knowledge acquired through latent learning processes is accessible to consciousness; it can also be expressed verbally.

Incidental learning refers to learning processes that occur accidentally. In contrast to incidental learning, there is unintentional or intentional learning, which relates to planned and targeted learning processes. Incidental learning and implicit learning are not exactly the same, "implicit learning, like incidental learning, can be incidental, but it does not have to be." [5]

By *procedural learning* is meant the building and improvement of skills without there is conscious access to the underlying knowledge.[6] Procedural learning relates primarily to the acquisition of cognitive and motor skills and is seen as form of learning of implicit learning.

2.2 Special features of implicit learning

2.2.1 Automatic learning processes

Automatic learning processes mean that implicit knowledge is automatically acquired without attention

control and that one does not need to deliberately discover the explicit laws in the tasks, especially when learning the grammatical rules.

2.2.2 Complexity of stimulus structures

The success of implicit learning and the degree of complexity are closely related: the more complex the patterns of processing are, the more successful is implicit learning. The conclusion can be proved by understanding the music. Ordinary people who have no musical knowledge are able to unconsciously grasp the structure of the more complex music. After a one-time or repeated listening, one can repeat the melody of a song without being able to specify how the melody is constructed. The structure of the grammatical structures of languages is also the case. Implicit learning allows a Chinese child to form flawless sentences with complex grammatical rules in their 6th year of age, although they cannot explain how they manage to do so. When learning the mother tongue, the children do not concentrate on the grammatical rules and the structure of the sentences, the children simply let them act on them.

2.2.3 Unaware of learning

The lack of accessibility to consciousness refers not only to the learning process, but also to the learning outcome (implicit knowledge). In implicit learning, the learner does not know what and how much he has acquired. Children who can successfully distinguish all members of a large family by recognizing the faces could not verbalize how they recognize people.

2.2.4 Influences on behavior

The influences of implicit knowledge on behavior do not depend on the intentions of the learner. Implicit knowledge changes behavior without intention. "You cannot consciously control the effect of implicit learning." Studies have shown that today children and adolescents behave much more aggressively. The experts see the countless acts of violence on television and the Internet as the reason for the increase in aggressiveness among children and adolescents. In television, the aggressive scenes implicitly influence the behavior of the children.

2.3 Forms of implicit learning

Implicit learning includes several forms such as priming, conditioning, the implicit acquisition of rule and procedural learning. The last two forms are the most important.

Implicit rule learning is understood as "the acquisition of regular knowledge or knowledge of the regular structure of complex systems." [6] The best-known example of implicit rule learning is the acquisition of the mother tongue. In a person's early years of life, the complex rules for phonetics, grammar, vocabulary formation and sentence structure are learned unconsciously but highly efficiently. Because implicit rule learning is not accessible to consciousness, three experimental measurement methods are used in research.

2.3.1 Learning artificial grammar

When researching artificial grammar, participants can implicitly master the arbitrary rules that determine, for example, letters, numbers, symbols, or artificial words.

2.3.2 Sequence learning tasks

"Sequence learning tasks" is also referred to as serial reaction time measurement. Through the experiment, the experts investigate the relationship between reaction times and fixed sequences. The participants acquire the implicit regularities about the sequence of stimuli, which increases the reaction speed.

2.3.3 Control of complex systems

In studies of the control of complex systems, difficult-to-see control systems are presented in the form of computer games. In simulation, people put themselves in a virtual role and try to solve problems that arise. The conclusion is that the participants show increasing performance after several passes. However, they are not in a position to state clearly what the improvement is due to.

Procedural learning focuses on the appropriation of cognitive and motor skills. "In procedural learning, cognitive or motor skills are gradually acquired through exercise by gradually replacing conscious processes with unconscious processes." [7]

2.3.4 Appropriation of motor skills

"Motor learning means acquiring the ability to adapt movements precisely and flexibly to current needs by varying the intensity, direction, and duration of movements according to the requirements of the environment." [8] Motor skills are of great importance in everyday life. For most people, the acquisition of motor skills begins in childhood. On the street or in the playground, the children try to imitate the movement of the adults. Most of the time, this is considered a game. However, children learn to jump, run, throw, roll and other skills in a playful way.

Motor learning processes represent an internal, complex and dynamic process that leads to stable and long-term changes in movement. For many years, the question of how people acquire motor skills has been of great interest. Motor skills are acquired by motor learning, which is more of a complex process. In general, researchers agree that motor learning combines the characteristics of implicit (procedural) and explicit (declarative) learning. On one hand, the learning process cannot be described verbally. On the other hand, the aspects of declarative learning are presented when people intend to learn certain sports or show strong self-control in the learning process.

2.3.5 Appropriation of cognitive skills

"Cognitive skills are mechanisms by which people solve cognitive tasks or problems." [9] Cognitive skills are required in school, professional or other areas where one is confronted with cognitive tasks such as mathematical problems. Cognitive skills include standard procedures and heuristic strategies.

2.4 Explicit learning

As a counterpart to implicit learning, psychologists often mention another form of explicit learning that is deliberately targeted. It seems that in school areas the latter is preferred by teachers and educators. Other than implicit learning, explicit learning occurs intentionally. Explicit learning refers to the learning processes that can be consciously, purposefully, intentionally controlled and controlled by attention. Explicit learning can be used "when the learning objective and the relationships to be learned are explicitly formulated or the subjects are asked to look for them" [10]. Explicit learning is based on explicit knowledge (also known as declarative knowledge). Declarative knowledge is stored in explicit memory. Explicit knowledge is acquired through attention-focus and conscious individual control, such as the deliberate direct learning of grammatical rules of a language or mathematical evidence in the classroom. When recording explicit learning processes, the verbal test is considered the most commonly used method. [11]

In a test, participants first learn some structures that are tested later. Through questionnaires, people record the knowledge of the tasks. When they are done with the preparation process, they are asked what they have remembered in the task or whether they are able to express the learned knowledge verbally during task solving.

Explicit and implicit learning are of great importance in everyday life. An environmental stimulus pattern is processed either explicitly or implicitly. But they represent two essentially different forms of learning, which are very different from each other by their own characteristics (see Table 1).

Table 1: Differences between implicit learning and explicit learning[12]

Differences	Implicit learning	Explicit learning
Efforts	Easy	Difficult
Learning	Unintentionally	Intentionally
Stability	Error robust	Error not robust
Knowledge	Difficult to verbalize	Easy to verbalize
Cognitive art	Warm (emotional)	Cool
Speed	Fast	Slow
Control	Automatically	Conscious
Solutions	Heuristic	Algorithmic
Representation	Holistic	Analytical

The depth of cognitive processing plays an important role in imprinting declarative knowledge. In explicit learning, memory performance improves through complex processing such as elaboration, which is of very little use to implicit learning.

Implicitly acquired knowledge is firmly anchored in implicit memory and hardly forgotten. Its durability depends on the number of repetitions. Explicit knowledge could be lost with a long interval or injury to certain brain organs.

Factors such as age, intelligence exert a smaller influence on implicit learning than explicit learning. The experts see implicit learning as a counterpart to explicit learning. They have different properties. Nevertheless, there is a complex relationship between them. In everyday life, they cannot always be sharply separated, because the two forms of learning mix in many learning processes. In a learning process, both forms of learning could occur. In swimming learning, for example, the action is first broken down into several small simple partial actions. Each sub-act is clearly described and explained in a verbal way. However, the description alone is not sufficient in the execution and coordination of the act "swimming". Only by repeating the action can you master the motor skills of swimming. Studies have shown that in some cases explicit learning promotes implicit learning, while in others it hinders.

In 1976, Reber's research in artificial grammar found that implicit learning processes are prevented if participants are encouraged to discover the rules that do not exist.

Chinese educators Guo Xiuyan and Yang Zhiliang conducted an artificial grammar experiment in 2002 to research the influence of active interaction between implicit and explicit learning on learning

performance.[12] The participants are divided into three groups. In the first group, they are asked to memorize a grammatical structure without being informed of the existence of the grammar rule. The participants are then presented with further structures that are formally similar to the structure shown. They should decide which structure is constructed according to the memorized structure. The experiment is used to train implicit learning. The people in the second group experience an experiment in explicit learning. They will be presented with some structures in which one or more errors are hidden. The job is to correct the errors. They are informed at the beginning that the structures are constructed according to certain rules, which they discover by solving tasks and according to which the errors are to be corrected. In the last group, the two experiments presented above are carried out one after the other. The persons memorize grammatical structures for the first step and are informed that there is a set of rules in them. Then they are given the task of correcting the errors in the structures constructed according to the rule. The experiment showed that the people in the last group mastered the rules best. Through the experiment it can be concluded that by combining the implicit and explicit learning one can expect the best learning achievements.

3. LANGUAGE LEARNING BY LANGUAGE LEARNING

Implicit learning takes place everywhere. Language is the ideal research object of implicit learning. Implicit learning contributes a great deal to language learning, especially the acquisition of the mother tongue.

Experts from psychology and pedagogy agree on the crucial role of implicit-learning the mother tongue. The existence of implicit learning explains the success of children who are able to speak words and simple sentences since very early in their lives without systematically learning the grammar of their mother tongue. In the real world, mother tongue is people's first language. People have been immersed in the atmosphere of their mother tongue since they were born. They learn their mother tongue in everyday life through games and communication. The acquisition of children's mother tongues is mostly incidental. Learning takes place without focused attention on the late acquired knowledge. Therefore, students can learn to speak their mother tongue unconsciously without systematically learning words and grammar rules. The implicit acquisition of the mother tongue has proved: Native speakers speak sentences without considering the grammar, because the implicit knowledge is in implicit memory and can be retrieved automatically when speaking. For foreigners who learn Chinese, the four tones are very difficult. The Chinese rarely encounter such problems. When writing Chinese characters, a Chinese will follow the correct stroke order, which is almost impossible for foreigners. Although scientists have been researching implicit learning for more than 50 years, they still have many questions about this form of learning left open to them. However, there is no doubt that implicit learning plays a critical role in foreign language learning. What is controversial is the question of which form of learning, implicit learning or explicit learning, makes greater contributions to learning a second language. In schools, it seems that educators ignore the influence of implicit learning. Little consideration is given to the use of implicit learning processes in teaching. The learning process and the learning material of the language are deliberately staged by the educators. The teaching is limited to the purely declarative teaching of explicit knowledge. The individual grammatical legality is introduced and elaborated by teachers. Students then learn to use the rule through intensive exercises. From the experiments carried out by the researcher Bialystok it can be concluded that both implicit and explicit learning have its strong sides. In grammatical error estimation, implicit knowledge is effective, while in-depth error analysis requires explicit knowledge. A representative view is that when learning a second language, the language of acquisition should be used. Learners can implicitly acquire the rules on phonetics, grammar, sentence building and word formation of their mother tongue by constantly using the foreign language. This also applies to the acquisition of foreign languages. Through permanent use of language, the language feeling is developed, on which fluent speech is based.

4. THE APPLICATION OF IMPLICIT LEARNING BY FOREIGN LANGUAGE LEARNING

When acquiring a second language, linguists do not doubt the function of implicit learning. The importance of implicit learning cannot be neglected when learning foreign languages. More consideration should be given to the application of implicit learning.

4.1 *Implicit learning strategies by foreign language learning*

Implicit learning includes several forms such as priming, conditioning, the implicit acquisition of rule and procedural learning. The last two forms are the most important.

4.1.1 *Creating a good atmosphere for language learning*

The successful learning of a language requires a good atmosphere in which learners are encouraged to communicate as much as possible in the target language. For non-native speakers, there is no learning environment at all which is completely identical to that of the country concerned. Creating a good atmosphere for language learning will be the task of teachers. The influence swayed by teachers on learners is partly due to the deliberate education of teachers in the classroom. However, learning the language in a natural way, namely through intensive language use, is considered to be the ideal and highly efficient learning method. Many learning opportunities are missed if one restricts language learning to teaching only. The language skills can also be implicitly acquired in the way of learners dealing with teachers. A German teacher can intentionally communicate with his students on German outside of class. While it is impossible that knowledge is memorized only at an involuntary sight, knowledge finds an access to implicit memory, which facilitates the explicit learning process. The less stress the learners have, the better they performance. Teachers should not be greedy with encouragement and tolerance when teaching languages.

4.1.2 *Taking into account the interest of learners*

The internal driving force of learning is of interest. When the learning material arouses the interest of the students, they show great initiatives and will to learn. Beginners consider language learning to be a fun experience. They enjoy learning. There are no major differences in performance between beginners. But

the interest in learning gradually decreases as learners are burdened after the initial stage by more complex sentence structures, abstract grammar rules, and large amounts of foreign words. The declining initiative has led to poor performance.

4.1.3 No neglecting the learning materials in the textbook

A textbook does not consist only of grammar and vocabulary. A common German teaching book "Study Path German" contains, for example, grammar, vocabulary, texts, as well as supplementary materials such as pictures, poems, songs that have nothing to do with the examination. Some teachers are convinced that the focus of the courses is on teaching and mastering grammar and vocabulary. Therefore, they only deal with grammar parts and vocabulary in teaching. The other parts such as pictures, drawings and poems are not taken into account. Their existence is deliberately ignored. Every minute of class should help mesmerism and understand cognitive knowledge, rather than waste on complementary materials such as images. In fact, the seemingly unnecessary learning material is used in its own way for language learning. The language rarely appears in life in the form of pure grammar rules or word lists, but in concrete form of a text, a song.

4.2 Implicit grammar learning

Traditional grammar learning focuses attention on memorizing and elaborating the rules. Each grammatical phenomenon is described in detail, the abstract rules are memorized word by word. Exercises deepen the explicit knowledge of the rules. Despite the effort, the desired effect is not achieved. By applying the rules in everyday communication, which they know well, the learners still make mistakes. Before they speak sentences, they must first think about the laws, which prevents fluent speaking. Studies have shown that implicit learning is more efficient than explicit learning when mastering grammatical regularities. The principle of implicit grammar acquisition is that students are not directly confronted with abstract grammar rules, but gradually develop the sense of language through intensive reading, listening and writing. The sense of language is a comprehensive intuitive perception and application of a language. This conceals an understanding of the correct and appropriate use of language that arises implicitly in learning processes. The following is about two hints in implicit grammar acquisition: - Grammar learning should not be limited to the rigid model, which revolves around explaining the rules, citing examples, and practicing. In the learning process, one should pay attention to the individual experiences and emotional feelings of the learners.

Better learning performance can be expected if implicit and explicit learning interacts in grammar acquisition. Each form of learning has its limitations. On the one hand, the dry rule representations and boring exercises tire the learners. On the other hand, it is impossible to implicitly form a comprehensive grammar rule system. In addition, due to the lack of precise explanation of rules, the implicitly acquired grammatical knowledge lacks accuracy. The increasing number of implicit exercises in various forms used in the classroom reflects the future trend. Exercises that educators can perform in implicit grammar teaching include oral exercises or intuitively choosing the correct answer. These exercises contribute to the transition from declarative to implicit knowledge and the automation of rules.

4.3 Implicit vocabulary learning

The amount of vocabulary to be learned in a language makes it impossible to be aware of all the words learned. Implicit learning provides an ideal solution to this problem. Researchers working on implicit vocabulary learning argue that the frequency of appearance and recording channels determine vocabulary learning performance. After reading a novel several times, one can expect an expanded vocabulary. If one encounters the same foreign word in several articles, he can understand and apply the word faster and better. When a word is presented simultaneously in a visual, auditory and written way, memory performance increases to a large extent. The high efficiency of implicit vocabulary learning is due to this: implicit learning happens unconsciously and the words casually learned through reading are stored in implicit memory. The more often the learners use the same word, the more firmly it becomes anchored in the memory. For example, people casually take a very brief look at a foreign word while reading. It could be the case that after closing the book they quickly forget the word. However, the word has already left traces in memory in the form of implicit knowledge. At the next encounter, implicit knowledge allows learners to quickly recognize the word. This increases the vocabulary capacity of learners.

4.4 Implicit learning when reading in a foreign language

When assessing the language level, reading skills is one of the decisive criteria. The process of acquiring reading skills is characterized by its implicit occurrences. When choosing what to read, learners subconsciously prefer reading materials that can arouse their interest. And the understanding of the reading material, which differs from person to person, cannot be controlled by consciousness. By repeatedly taking up the subject matter, the readers master the

linguistic structures. In this way, the feeling for language gradually develops, which deepens the understanding of the reading material and increases reading skills.

By implicit learning people can use the following reading strategies to improve reading skills. Massive reading: In order to master a foreign language as efficiently as possible, reading the original literary works in the target language is one of the most suitable methods. For those readers who deal with several original works, learning vocabulary and grammar becomes much easier. Stimulating the initiative of the learner: Reading is essentially an individual activity of the reader. The emotions and personal experiences of the readers participate in text understanding and word processing. Put emphasis on reading aloud and memorizing: It is advisable to read the masterpieces or well-structured articles even to learn by heart.

5. SUMMARY

The theoretical research and practice of implicit learning have greatly impacted traditional educational concepts. However, the research on implicit learning is still in the exploratory stage, and many issues need to be further deepened. For example, what kind of implicit guidance is more conducive to the acquisition of knowledge in foreign language teaching? How to better combine implicit learning with explicit learning? These are waiting for us to explore.

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