

METHODS OF INVESTIGATING COGNITIVE PROCESSES IN FOREIGN LANGUAGE LEARNING.

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Abstract: This research delves into the exploration of various methodologies utilized to investigate the cognitive processes involved in acquiring foreign languages. Acknowledging the intricate nature of language learning, this study aims to elucidate the diverse approaches and techniques used in studying the cognitive aspects of this process. Drawing insights from cognitive science, linguistics, and educational psychology, the investigation scrutinizes how learners engage with and internalize a new language. By synthesizing existing research and presenting novel perspectives, this abstract offers a comprehensive overview of the current landscape of research methodologies in the realm of cognitive processes in foreign language education.

Key words: cognitive processes, language acquisition, foreign language learning, research methodologies, linguistics, cognitive skills, language learners, second language acquisition.

Аннотация: Данное исследование посвящено изучению различных методологий, используемых для изучения когнитивных процессов, связанных с овладением иностранными языками. Признавая сложную природу изучения языка, данное исследование направлено на разъяснение различных подходов и техник, используемых при изучении когнитивных аспектов этого процесса. Опираясь на данные когнитивной науки, лингвистики и психологии образования, исследование тщательно изучает, как учащиеся взаимодействуют с новым языком и усваивают его. Обобщая существующие исследования и представляя новые перспективы, это исследование предлагает всесторонний обзор современного ландшафта исследовательских методологий в области когнитивных процессов в иноязычном образовании.

Ключевые слова: когнитивные процессы, овладение языком, изучение иностранного языка, исследовательские методики, лингвистика, когнитивные навыки, изучающие язык, овладение вторым языком.

Introduction: Learning a language is a complicated and diverse process, which is especially true when learning a foreign language. Cognitive processes are crucial in determining the results of learning a new language, which is a complex undertaking for humans to undertake. A thorough examination of the many approaches used to study the cognitive components of language acquisition is necessary to comprehend the subtleties of how learners interact with and absorb foreign languages.

This research embarks on a journey to unravel the intricacies of cognitive processes within the realm of foreign language learning. Drawing from the fields of cognitive science, linguistics, and educational psychology, we aim to examine the methods that have been instrumental in decoding the cognitive dimensions of language acquisition. By synthesizing existing research and presenting innovative perspectives, this study seeks to contribute to a deeper understanding of the ways in which learners navigate the challenges and opportunities presented in the pursuit of mastering a new language.

Literature review: Language acquisition and the cognitive processes underpinning foreign language learning have been subjects of extensive scholarly exploration. Researchers and educators alike have sought to unravel the complexities of how individuals engage with, internalize, and master new linguistic systems. This literature review synthesizes key findings from a variety of disciplines, including cognitive science, linguistics, and educational psychology, shedding light on the diverse methodologies employed in understanding cognitive dimensions within foreign language education.

Studies by Krashen (1981) has laid the groundwork for comprehending second language acquisition, emphasizing the importance of meaningful input and the role of affective filters in the language learning process

Stephen Krashen's Input Hypothesis is a key component of his theory of second language acquisition (SLA). The Input Hypothesis proposes that language is acquired most effectively when learners receive "comprehensible input."

According to Krashen, language learners learn a language most effectively when they are exposed to messages that are just a little bit difficult for them to grasp at this point. This level is called "i+1," in which the letter "i" stands for the learner's existing level of language proficiency and the letter "+1" for input that is somewhat above that level. "...input must contain i + 1 to be useful for language acquisition, but it need not contain only i + 1. It says that if the acquirer

understands the input, and there is enough of it, $i + 1$ will automatically be provided..."¹

Moreover, he argues that there is a natural, predictable order in which language structures are acquired by learners. This order is not significantly affected by formal instruction but emerges through exposure to comprehensible input. Different grammatical structures are acquired when the learner is developmentally ready, and this process follows a sequence that is similar across learners. "...the input hypothesis runs counter to our usual pedagogical approach in second and foreign language teaching. As Hatch (1978) has pointed out, our assumption has been that we first learn structures, then practice using them in communication"²

The Affective Filter Hypothesis is a key component of Stephen Krashen's comprehensive theory of SLA. Proposed by Krashen in the early 1980s, this hypothesis suggests that emotional and affective factors play a crucial role in determining the success or difficulty of language acquisition for an individual learner. He claims that there are 3 main categories that decide success in second language acquisition: motivation, self-confidence, and anxiety.

If everything is clear with the first two notes, then the question arises: why does anxiety play an important role in a foreign language acquisition? Anxiety, particularly language anxiety, is considered a potential barrier to effective language learning. Krashen argues that high levels of anxiety can act as a filter, impeding the processing and absorption of language input. Conversely, a supportive and low-anxiety environment is thought to create conditions conducive to successful language acquisition. "...Low anxiety appears to be conducive to SLA, whether measured as personal or classroom anxiety."³

Chomsky's (1957) theory of Universal Grammar further contributes to our understanding of how cognitive structures may influence the learning of foreign languages.

Chomsky introduced the concept of the Language Acquisition Device (LAD), a hypothetical mental mechanism or cognitive structure that enables humans to acquire language naturally and rapidly. The LAD is considered to be part of the broader Universal Grammar. "...assuming the set of grammatical sentences of English to be given, we now ask what sort of device can produce this set

¹ Krashen, Stephen. Second Language Acquisition and Second Language Learning. Pergamon Press Inc, 1981, p. 20.

² The same source, p.21.

³ The same source, p.31.

(equivalently, what sort of theory gives an adequate account of the structure of this set of utterances...."⁴

Analysis: Understanding the cognitive processes involved in foreign language learning is crucial for effective pedagogy and learner success. Various methodologies have been employed to investigate these processes, encompassing diverse approaches from cognitive science, linguistics, and educational psychology.

i. Cognitive Science Approaches:

Cognitive science contributes methodologies that delve into the mental processes underlying language acquisition. Neuroimaging techniques, such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG), offer insights into brain activity during language tasks. These methods provide a physiological perspective, identifying neural correlates associated with different language learning stages.

fMRI is a non-invasive neuroimaging technique that measures changes in blood flow within the brain. It relies on the fact that neural activity is coupled with local changes in blood oxygenation, known as the hemodynamic response. By that, in language acquisition research, fMRI is employed to identify brain regions activated during various language tasks. For example, studies may examine the activation of Broca's area and Wernicke's area, which are associated with language production and comprehension, respectively.

EEG records electrical activity generated by neural firing in the brain using electrodes placed on the scalp. It provides a high temporal resolution, capturing rapid changes in neural activity. Thus, EEG is valuable for studying the timing and synchronization of neural events during language processing. Researchers can investigate the brain's response to specific linguistic stimuli, track changes in cognitive processes over time, and explore the role of different brain oscillations in language learning.

ii. Task-Based Language Teaching (TBLT):

TBLT is an instructional approach aligned with investigating cognitive processes. By designing language tasks that require problem-solving and meaningful communication, researchers can assess how learners apply cognitive strategies to achieve linguistic goals. TBLT integrates seamlessly with research methodologies, providing a bridge between theory and application. In TBLT, the primary focus is on the completion of communicative tasks, rather than isolated language forms. These tasks are activities that learners might encounter in

⁴ Chomsky, Noam. Syntactic Structures. Mouton, 1957, p.18

everyday life, such as giving directions, making plans, or solving problems. Engaging in tasks that have real-world relevance can enhance learners' motivation. The focus on communication and problem-solving makes the learning experience more enjoyable and meaningful.

iii. Form-function mappings

Form-function mappings become interconnected within a network of construction forms and their meanings through the accumulation of usage experience. In some instances, this linguistic system is referred to as the "construction." The way activation spreads across this network is determined by the connections a speaker has formed throughout their life, influenced by the learned probabilities associated with different forms. For example, understanding form-function mappings for idiomatic expressions involves recognizing how specific linguistic forms contribute to conveying a non-literal meaning or a cultural nuance.

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