A Review of Studies on Incidental Acquisition of Second Language Vocabulary

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Abstract

This paper reviews research on incidental vocabulary acquisition (IVA) in second language learning conducted both in China and abroad over the past two decades. Incidental vocabulary acquisition refers to the unconscious acquisition of new vocabulary by learners during non-explicit vocabulary learning activities such as reading or listening. This review focuses on the relationship between language skills and IVA, the influence of input and output on vocabulary acquisition, the promotion of vocabulary learning through multiple language skills, and IVA in multimedia environments. Additionally, it explores how learner factors, multimedia tools, and cross-cultural perspectives impact IVA. Based on an analysis of current literature, existing gaps are identified, and future research directions are suggested, including the integration of emerging technologies like virtual reality in vocabulary learning and the design of individualized tasks for learners of varying proficiency levels. The aim is to encourage deeper exploration in this field and provide pedagogical implications for enhancing vocabulary acquisition efficiency in second language teaching and learning.

Key words

Incidental Acquisition, Vocabulary Learning, Second Language

1. Introduction

In the process of developing basic language skills such as listening, speaking, reading, and writing, incidental vocabulary acquisition (IVA) plays a vital role. Unlike traditional vocabulary learning methods that intentionally focus on memorization, IVA occurs naturally during various language activities, including listening, speaking, reading, writing, or viewing. This form of learning not only enriches learners' vocabulary but also enhances their sensitivity to the language and their ability to use it.

The concept of IVA can be traced back to early 20th-century psychology. For example, research in experimental psychology at that time explored the phenomenon of unconscious learning, laying a theoretical foundation for the later emergence of IVA studies [1]. However, systematic research on IVA began in 1985 when Nagy, Herman, and Anderson formally introduced the concept through their study on children's first language vocabulary acquisition [2]. They found that children could unconsciously learn new words while engaging in reading activities focused on content comprehension. Later, Laufer emphasized that IVA generally occurs when learners are engaged in language activities without explicitly focusing on vocabulary learning [3].

In recent decades, with the deepening of second language acquisition research, IVA has attracted increasing attention from scholars. This is because, compared with explicit vocabulary learning, IVA is more in line with the natural law of language acquisition, allowing learners to acquire vocabulary in real language use scenarios, thereby improving the practical application ability of vocabulary. A large number of studies have shown that IVA is not only an important way for learners to expand their vocabulary but also an important indicator to measure the effectiveness of second language learning [4].

This review aims to analyze and synthesize domestic and international research findings on IVA over the past two decades, summarize the current research status, identify existing problems, and put forward future research directions. It is expected to provide theoretical references and practical guidance for improving learners' vocabulary acquisition efficiency through scientific teaching strategies.

2. Research Background

The concept of "incidental acquisition" originated in experimental psychology in the early 20th century. At that time, psychologists conducted a series of experiments on unconscious learning, such as the study of implicit memory, which found that individuals could acquire certain knowledge or skills without conscious attention, laying the theoretical groundwork for the later research on incidental vocabulary acquisition [1].

The term "incidental vocabulary acquisition" was formally proposed by Nagy, Herman, and Anderson in 1985. In their classic study on children's first language vocabulary acquisition, they selected a group of primary school students as subjects and asked them to read a series of storybooks. After reading, the researchers tested the students' mastery of new words in the storybooks. The results showed that the students could unconsciously learn these new words while

focusing on understanding the story content, and the number of acquired words was positively correlated with the number of readings [2]. This study not only confirmed the existence of IVA but also provided a research paradigm for subsequent studies.

On the basis of Nagy et al.'s research, Laufer further clarified the connotation of IVA. She argued that IVA occurs in situations where learners do not intentionally try to memorize vocabulary but acquire words through contextual exposure [3]. She pointed out that this form of learning may initially involve shallow processing, such as recognizing word forms or categories, but through repeated exposure and use in different contexts, it can lead to deeper learning, including mastering word meanings, collocations, and usage scenarios.

Most current scholars accept Laufer's view and have further expanded the research on IVA. For example, some scholars have found that even limited attention to word form can start the acquisition process, especially when reinforced by repeated encounters [4,5]. They believe that the key to IVA lies in the interaction between learners' cognitive processing of language input and contextual information. In addition, with the development of cognitive psychology and second language acquisition theory, scholars have gradually explored the internal mechanisms of IVA from the perspectives of information processing, attention allocation, and memory retention, making the research on IVA more in-depth and systematic.

3. Research Status

3.1 The Relationship between Language Skills and Incidental Vocabulary Acquisition

Listening and reading are the two language skills most frequently studied in relation to IVA, and a large number of studies have explored the specific mechanisms and influencing factors of IVA in these two skills.

In terms of listening, Chang and Li conducted a study on the relationship between metacognitive strategies and IVA in listening. They selected 120 non-English major freshmen from a university as subjects and divided them into an experimental group and a control group. The experimental group received metacognitive strategy training, such as setting listening goals, monitoring the listening process, and evaluating listening results, while the control group received conventional listening training. After a 12-week training, the researchers tested the subjects' incidental vocabulary acquisition in listening activities. The results showed that the vocabulary acquisition effect of the experimental group was significantly better than that of the control group, indicating that the use of metacognitive strategies in listening can improve vocabulary acquisition. This suggests that developing learners' critical thinking and problem-solving skills is crucial for enhancing IVA in listening [6].

Wang and Zhen, based on the Involvement Load Hypothesis, designed three different listening tasks with different involvement loads: listening and answering simple questions (low involvement load), listening and summarizing the main content (medium involvement load), and listening and debating on relevant topics (high involvement load). They selected 90 English learners with similar proficiency levels as subjects and assigned them to three groups to complete the corresponding tasks. After the task, the researchers tested the subjects' retention of new words in the listening materials. The results found that the higher the cognitive investment in listening tasks, the better the vocabulary retention, which verified the effectiveness of the Involvement Load Hypothesis in listening-based IVA [7].

In terms of reading, it is widely recognized as an effective way to acquire vocabulary incidentally. Zhang conducted an empirical study on Chinese EFL learners' vocabulary acquisition through reading. He selected 150 English learners with different vocabulary sizes and asked them to read the same English article containing 30 new words. After reading, he tested their mastery of these new words. The results showed that when learners' vocabulary size reached a certain threshold (about 3,000 word families), their incidental vocabulary acquisition efficiency in reading significantly improved [8]. This indicates that learners' existing vocabulary base is an important factor affecting IVA in reading.

Lei compared the IVA effects of enriched reading environments and natural reading environments. The enriched reading environment in the study included providing vocabulary annotations, setting up vocabulary exercises after reading, and organizing group discussions on new words, while the natural reading environment only required learners to read articles. The study selected 80 English majors as subjects and divided them into two groups. After 8 weeks of reading training, the test results showed that the IVA effect of the enriched reading environment group was significantly better than that of the natural reading environment group [9]. This suggests that appropriate vocabulary reinforcement measures in reading can effectively promote IVA.

In addition to listening and reading, some scholars have also explored the relationship between speaking and IVA, but relevant studies are relatively few. A small number of studies have found that speaking activities, especially interactive communication, can also promote IVA. For example, when learners engage in conversations, they need to guess the meaning of new words according to the context, ask for explanations, or use new words tentatively, which can deepen their understanding and memory of new words. However, compared with listening and reading, the effect of speaking on IVA is more affected by factors such as the frequency of new words in the conversation, the depth of interaction, and learners' proficiency levels.

Overall, these findings indicate that both listening and reading are effective means of IVA, and their effects are influenced by variables such as learning strategies, input frequency, vocabulary base, and learners' first language

background. Future research needs to further explore the relationship between other language skills (such as speaking) and IVA, and clarify the specific mechanisms.

3.2 The Effects of Input and Output on Incidental Vocabulary Acquisition

Input-based activities such as reading and listening are crucial for vocabulary acquisition, and output activities such as speaking and writing also play an important role in consolidating and deepening vocabulary acquisition. A large number of studies have focused on the role of input and output in IVA and their specific effects.

In terms of input, Peters and Webb evaluated the effect of sustained input on IVA by having learners watch an entire TV series. They selected 60 intermediate English learners as subjects and asked them to watch all episodes of a TV series within 4 weeks. During the viewing process, the learners were not required to pay special attention to new words. After viewing, the researchers tested the learners' recognition and retention of new words in the TV series. The results showed that IVA through watching TV series enhanced learners' word meaning recognition and retention, and this effect was influenced by input frequency (the more times a word appeared, the better the acquisition effect), prior knowledge (learners with higher existing vocabulary levels acquired more new words), and lexical relationships (words with semantic relevance were easier to acquire together) [4].

Input intensity and frequency are key variables in IVA. Lei explored the effect of annotated input on IVA. He designed three input conditions: input with L1 annotations, input with visual aids (pictures), and input without annotations. He selected 90 non-English majors as subjects and assigned them to three groups to read articles under different input conditions. The test results showed that the annotated input conditions, especially with L1 or visual aids, significantly improved vocabulary acquisition compared with the no-annotation condition [9]. This indicates that appropriate input enhancement can promote learners' attention to new words and improve the effect of IVA.

Learners' proficiency levels also affect the efficacy of input. Tremblay conducted a study on the relationship between learners' proficiency levels and input effectiveness in IVA. He selected 150 learners with elementary, intermediate, and advanced English proficiency levels and provided them with the same reading materials. The results showed that advanced learners had a significantly better IVA effect than elementary and intermediate learners, and the input materials suitable for their proficiency levels could better promote IVA [5]. This highlights the need to tailor task design according to learners' proficiency levels.

For multilingual learners, their L2 background can affect L3 vocabulary learning. Grey studied the IVA of L3 vocabulary by multilingual learners. He found that learners' L2 proficiency and the similarity between L2 and L3 had a significant impact on L3 IVA. Specifically, learners with higher L2 proficiency performed better in L3 IVA, and the more similar L2 and L3 were in terms of vocabulary, the more obvious the positive transfer effect [1].

In terms of output, Wang compared the effects of input and output tasks with equal involvement load on IVA. He designed an input task (reading an article and answering questions) and an output task (writing a summary of the article) with the same involvement load, and selected 60 English learners as subjects. The results showed that the output task had a better effect on vocabulary retention, while the input task had a better effect on vocabulary recognition [11]. This indicates that input and output tasks have different impacts on vocabulary acquisition, and both are indispensable in second language vocabulary teaching.

Overall, these findings indicate that IVA tends to enhance understanding and retention of word meanings rather than form. They also suggest that second language teaching should balance input and output activities, take into account learners' individual differences such as proficiency levels and language backgrounds, and design appropriate input and output tasks to maximize learning effectiveness.

3.3 Research on Promoting Vocabulary Learning Through Multiple Language Skills

With the deepening of research, scholars have gradually realized that relying solely on a single language skill for IVA has certain limitations, and integrating multiple language skills can better promote vocabulary learning.

Chinese researchers began to explore how writing promotes vocabulary learning relatively late, not until 2007. Lei et al. conducted a comparative study on the effects of writing and reading on IVA among Chinese learners. They selected 100 non-English majors as subjects and divided them into a writing group and a reading group. The writing group was asked to write articles using the new words learned, while the reading group was asked to read articles containing the same new words. After 6 weeks, the test results showed that the writing group had a better IVA effect than the reading group [9]. In addition, their research also found that there was no significant difference in long-term retention (tested 4 weeks after the end of the experiment) across different writing tasks, such as narrative writing and argumentative writing, which challenged Laufer's claim that different involvement loads in writing tasks lead to different long-term retention effects [3].

Other studies have also shown that integrating direct and indirect learning strategies through a combination of listening, speaking, reading, and writing can comprehensively enhance vocabulary acquisition. For example, a study designed a 16-week integrated language skills training program: learners first listen to a passage to get a general understanding, then read the passage carefully and underline new words, then discuss the content of the passage in groups (speaking), and finally write a review of the passage. The results showed that compared with the group that only received

single-skill training, the integrated training group had a higher vocabulary acquisition rate and better application ability [6].

Especially for learners with weaker foundations, diversified methods can increase word exposure and motivation, encouraging them to better use newly learned vocabulary in real communication. For example, for learners with low vocabulary levels, teachers can first use listening materials with simple language and repeated new words to help them initially recognize new words, then use reading materials with annotations to deepen their understanding, then organize speaking activities to let them use new words in communication, and finally consolidate them through writing. This step-by-step integrated training can effectively improve their confidence and effect in vocabulary learning.

As empirical research progresses, teaching practices should consider learners' individual differences, such as learning styles, cognitive levels, and learning interests, and adjust strategies accordingly to achieve optimal results. For example, for visual learners, more visual materials can be added in the integrated training; for auditory learners, more listening and speaking activities can be arranged.

3.4 Incidental Vocabulary Acquisition in Multimedia Environments

With the rapid development of multimedia technology, digital tools have gradually become an important auxiliary means for second language learning, and researchers have begun to explore how these tools can facilitate IVA.

Wu and Xu examined the impact of visual (picture) and textual annotations on vocabulary recognition and recall in multimedia environments. They selected 150 English learners as subjects and divided them into four groups: image-only annotation group, text-only annotation group, image-text combined annotation group, and no-annotation group. The subjects were asked to learn new words through multimedia courseware with different annotation forms. The test results showed that all three annotated conditions significantly outperformed the no-annotation condition, and the image-text combination was the most effective [12]. This is because image annotations can help learners establish a direct connection between word forms and meanings, while text annotations can provide accurate semantic explanations, and the combination of the two can complement each other, enhancing learners' memory of new words.

Liu explored the impact of different input modes and input frequency on IVA in multimedia environments. He designed three input modes: text, audio, and video, and set three input frequencies: 3 times, 6 times, and 9 times. A total of 270 English learners were selected as subjects and assigned to 9 groups according to different input modes and frequencies. The results showed that different input modes had significant effects on target word acquisition, with video input being the most effective, followed by audio input, and text input being the least effective. In addition, higher input frequency significantly promoted target word acquisition, and the effect of increasing frequency was more obvious in video input [10]. This is because video input integrates image, sound, and text, providing richer contextual information, which is conducive to learners' understanding and memory of new words.

In addition to annotations and input modes, other multimedia tools such as educational games and social software have also been found to have positive effects on IVA. For example, some studies have shown that educational games can increase learners' interest in learning through interesting task settings and reward mechanisms, making them unconsciously acquire new words in the process of playing games. Social software can provide learners with more opportunities for interactive communication, and in the process of communication, learners can acquire new words through context and feedback.

4. Commentary

4.1 Future Prospects

Although existing studies have provided valuable insights into IVA, there are still many aspects that need further exploration.

Firstly, with the rise of mobile learning and virtual reality (VR) technology, future research can investigate how different multimedia tools and digital environments affect IVA. For example, VR technology can create immersive language learning environments, allowing learners to interact with virtual characters and scenarios, which may have a unique impact on IVA. Researchers can design comparative studies to explore the IVA effects of VR environments, traditional multimedia environments, and non-digital environments, and analyze the specific mechanisms.

Secondly, personalized tasks tailored to learners' cognitive styles, motivations, and prior knowledge may improve IVA outcomes and deserve further study. At present, most studies adopt a one-size-fits-all research design, ignoring learners' individual differences. Future research can use adaptive learning systems to design personalized learning tasks for learners with different characteristics and test the effectiveness of these tasks in promoting IVA.

Thirdly, although the relationships between language skills (listening, speaking, reading, writing) and IVA have been examined, how to effectively integrate these skills to create a rich input-output environment for vocabulary learning still requires further exploration. For example, researchers can design a series of integrated teaching activities and use structural equation modeling to analyze the interaction between different language skills in promoting IVA, so as to find the optimal combination mode.

Fourthly, cross-cultural comparative studies are another important direction. Different cultural backgrounds may affect

learners' language learning styles and cognitive processing modes, thereby influencing IVA. Cross-cultural studies can reveal universal patterns and specific strategies of IVA across linguistic and cultural contexts. For instance, comparing IVA effects among learners from collectivist cultures (such as China) and individualist cultures (such as the United States) when engaging in collaborative language activities could uncover cultural differences in attention allocation and knowledge internalization during incidental learning. Such findings would provide a more comprehensive theoretical framework for cross-cultural second language teaching.

Fifthly, the neural mechanisms underlying IVA warrant deeper investigation. With advancements in cognitive neuroscience, technologies like functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) can be employed to observe brain activity changes during incidental vocabulary acquisition. This could help clarify how different language inputs (e.g., audio, video, text) or processing depths (shallow vs. deep) affect neural activation in brain regions related to memory and language processing, thereby revealing the cognitive basis of IVA.

Finally, long-term tracking studies on IVA are relatively scarce. Most existing studies adopt short-term experimental designs (e.g., several weeks), making it difficult to capture the dynamic changes in vocabulary retention and application over time. Future research could conduct longitudinal studies spanning 6 months to 2 years, tracking learners' incidental vocabulary acquisition in real educational settings and analyzing the impact of factors such as cumulative input quantity, contextual diversity, and usage frequency on long-term vocabulary retention.

4.2 Conclusion

Incidental vocabulary acquisition, as a crucial component of second language learning, has undergone extensive exploration over the past two decades, yielding substantial theoretical and empirical achievements. Research has clarified the definition and occurrence conditions of IVA, identified the roles of language skills (listening, reading, writing, etc.) in IVA, and revealed the influence of input/output characteristics, multimedia environments, and learner factors on incidental vocabulary acquisition. These findings have not only enriched the theoretical system of second language acquisition but also provided practical guidance for optimizing vocabulary teaching strategies.

However, the field still faces challenges. For example, the interaction mechanisms between different language skills in promoting IVA remain underexplored, and the application of emerging technologies (e.g., VR, artificial intelligence) in IVA requires further validation. Additionally, individual differences among learners (e.g., cognitive styles, motivational levels) have not been sufficiently integrated into research designs, limiting the personalized guidance of teaching practices.

Looking ahead, with the integration of interdisciplinary theories (e.g., cognitive psychology, educational technology, neuroscience) and methodological innovations, research on IVA will move toward a more refined and diversified direction. By deeply exploring the impact of emerging technologies, strengthening personalized task design, and expanding cross-cultural and longitudinal studies, scholars can provide more targeted theoretical support and practical strategies for second language vocabulary teaching. Ultimately, this will contribute to improving learners' vocabulary acquisition efficiency, enhancing their comprehensive language proficiency, and facilitating better cross-cultural communication in an increasingly globalized world.

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