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The Effect of Visual Stimuli on L2 Acquisition

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Abstract: This paper introduces the impact of visual stimuli on the acquisition of a Second Language (L2) or foreign language learning (FLL). Based on the importance of the role of vision in research, the findings can be classified according to three categories:(1) the comparison of multimodal audiovisual integration with conventional single-input integration; (2) the beneficial impact of visual elements on emotional stimulation; and (3) the rational synergy between the human visual system and language learning. Looking into recent studies, it is clear that people are increasingly turning to visual interactions rather than only conventional resources. Prior studies have largely concentrated on visual aids used in classroom instruction as a comprehensive tool, as opposed to a set of stimuli that are received and released. As a result, there was little discussion and attention paid to internal linkages. In line with visual contact, there has been a steady and robust advancement in social networks, encompassing well-known sites like Facebook, Instagram, YouTube, and TikTok, increasing the frequency and diversity of interactive, multi-way communication. Older and newer types of picture resources are distinguished based on how interactive they are. The success of language acquisition will be influenced by the degree of involvement. The discussion will mainly focus on emotional interaction and response mechanisms, including input, output, and attention. Three representative key literature will be selected from the classification module for in-depth study and their importance will be analyzed, aiming to describe the impact of visual stimuli on L2 acquisition from different perspectives. This balances the value of visual impacts with the potential drawbacks, allowing for new study ideas and development approaches in the field of L2 acquisition as well as the quest for more cutting-edge and successful learning techniques in the future. The results also show that visual stimuli have an important impact on L2 acquisition or foreign language learning in different dimensions in terms of interactive characteristics, whether from the perspective of cognitive-linguistic, sociolinguistic, or psycholinguistic.

Keywords: visual stimulation, multimodality, interactivity, L2 acquisition

1. Introduction

Previous research has not specifically assigned a function to visual aspects in the concept of video listening, despite the increasingly common use of digital video and multimedia in the teaching of listening in a second language. Instead, the focus has been on the importance of listening elements. It is evident that the role of the visual organ contributes to the objective environment and explains a

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growing fraction of life. More than half of the research looked at people's cognitive attitudes regarding the format, and over two-thirds of the data from earlier 2013 studies showed that video podcasting had favorable benefits. This is mostly due to the fact that video podcasting's visual format makes the information more vivid and understandable, which improves comprehension [1]. This also shows that the stimulation of visuals may be constantly amplified under the development of media in order to meet people's needs.

As more students' perspectives are opened to the incredible benefits of the Internet and network connectivity research, patterned learning helps students transfer and integrate their knowledge while also giving them the chance to take in more new information [2]. According to Seimens, traction is formed and enabled by the improvement and growth of links with other nodes, which occurs as nodes and nodes develop independent associations, strengthening self-identity, increasing pleasure, and increasing job efficiency [3]. L2 acquisition, which naturally combines with social networks, has a huge effect. Social media refers to content-based forms of electronic communication such as websites, blogs, chats, computer programs, etc., which allow people to share information and express ideas between native speakers on a global scale and in different regions, regardless of geographical barriers and time constraints. The study by Larreta-Azelain and Monje aimed to improve the foreign language skills of 174 adult learners in online distance education courses in English, French, Italian, Greek, and German by integrating short video courses into multilingual courses [4]. This clarifies the L2 learning model's emphasis on content-based second language acquisition or foreign language learning in the context of an online learning environment. Build a self-directed virtual learning environment for language learners using the MOOs framework, emphasizing optional components like technical variety, peer support, and self-learning principles. To a certain extent, computer-assisted language learning (CALL) is a tool for connecting with second-language learners, and the integration of Web 2.0 has created a certain disconnect between the second-language learning process and the typical classroom environment [2].

First, short videos can simulate real-world situations, immerse students outside of the classroom, encourage them to interact with teachers, and stimulate their desire [5].The importance of interactivity in language acquisition has been demonstrated and emphasized in many studies. The definition of interactivity here will not be strictly limited, but it mainly delineates three aspects: (1) interaction between people; (2) interaction between people and visual carriers; (3) interaction within the human cognitive system, in order to cover more reference literature. At the same time, "interactivity" serves as a key term in this study to explain how to maximize the impact of the natural language environment.

Vygotsky's socio-cultural theory holds that language development is achieved through interaction with peers, friends, family members, etc. In addition, this involves unconscious learning, which is also part of implicit collateral learning by reading texts, communicating with others, watching videos, etc [6].

Making films and video clips targeted at native speakers is a very helpful language teaching tool because it helps language learners comprehend how native speakers actually use language in sentences. These films can help language learners comprehend words and sentences more deeply by illuminating the principles and feelings that behind them. Playing these movies in class provides all the information needed to understand the pronunciation, usage, and meaning of words in the target language while simulating the real setting of native speakers [5].

2. Multimodal Audiovisual Integration vs. Conventional Single-Input Integration

The utilization of visual elements in traditional learning and teaching resources, such as themed illustrations and gestures with specific meanings, has been relatively limited in terms of form. These resources primarily serve formal and serious contexts, which has somewhat restrained their potential for rich development. Additionally, the widespread introduction of broadband and significant

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improvements in computer performance have accelerated the development of transmitting acceptable quality audio and visual content through computers [7]. This has made it possible for fully networked, full-featured multimedia technology to emerge, while also allowing visual elements to play a more remarkable role in multimodal presentations.

Before 2013, the predominant types of videos were mainly categorized as "short clips" and "short movies" rather than "short videos" [5]. Video materials are considered to be a highly valuable resource in language learning because they allow the audience to visually immerse themselves in complete communicative situations [8]. On the other hand, Krashen's input and output hypothesis clearly explains the relationship between receptive skills and productive skills in language learning. It is widely recognized that comprehension abilities gradually become more practical [9]. Studies have shown that informal exposure to foreign languages does not require a lot of extra effort and is helpful for foreign language learners. For example, in specific cases, this exposure in childhood can help foreign language learners acquire a more language-like accent in adulthood [10]. The improvement of foreign language speech perception is due to watching foreign language movies with foreign language subtitles [11].

More precisely, research has indicated that this kind of exposure during childhood can help learners develop a more native-like accent in adulthood [10]. For advanced learners, improving their ability to perceive foreign language sounds can be enhanced by watching foreign language movies with subtitles [12].

It is evident that brief multimodal stimuli are used to acquire it. On the other hand, individuals who were given mismatched images did not gain anything from the learning phase's previous words; in fact, the incorrect images caused harm to them. 13]. Furthermore, brief exposure to Florida weather forecasts has been shown to enhance sensitivity to words mentioned in the report when compared to other foreign words [14]. Therefore, it can be seen that foreign vocabulary is acquired through brief multimodal stimuli.

3. Input and Output Mechanisms, as well as Attention

Many researchers have studied the impact of visual input enhancement pedagogical interventions on grammar learning, and there is a growing study of visual input enhancement (VIE), also known as written or text enhancement. Some studies have tapped into the possibility of making it easier for second-language learners to perceive input by using enhanced techniques with typographic cues such as e+g+, underline, bold, italics, capitalization, or other strategies such as color coding and so on [15].

The attention hypothesis provides the basis for this statement: in order for a second-language learner to process a learned input, it must first be noticed + and enhancing the input using typographic techniques can increase the chances of visually prominent input being noticed, thus establishing traces in long-term memory [16].

By adjusting and comparing multiple variables in the experiment, VIE had a relatively positive effect on the learning of grammar items compared to more implicit input flooding techniques or providing as many instances of the target L2 form as possible in the input [17]. Lee contends that attention-grabbing VIE techniques may have a negative effect on learners' comprehension and suggests that balanced interventions are necessary to teach second-language forms during the reading process in the context of psycholinguistic discussions about learners' attention and the relationship between form and meaning [18]. The study's meta-analysis compiled earlier research to look at VIE studies and assess if VIEs were helpful for grammar acquisition. However, it was found that only a small number of studies have been conducted since the emergence of VIE studies and more comprehensive and detailed tests are needed to control some variables, such as learner proficiency, participants' prior knowledge, degree of treatment intensity (depending on the number of treatments and length of text read), and reported attention may be intervention variables [17].

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However, the overall results of some studies suggest that learners exposed to reinforced text perform better than learners who read unreinforced text providing a valuable basis for future research. Potential advantages and disadvantages of using video and subtitles: Many researchers have demonstrated that using video in a language learning environment has a strong motivational potential. Vanderplank, Secules et al., Stempleski, and Gruba note that language learners are more inclined to learn by watching a video when choosing between audio and video [19]. When it comes to video captioning, the focus on input is key to the development of learner mediation systems, prompting many researchers to explore strategies that might draw learners' attention to the new language. One of them is Batstone's principle of "giving to new", i.e. learners facilitate understanding of a new language through the use of context or contextual clues and prior knowledge [20].

Subtitled video material not only enhances understanding of the content but also helps learners learn new second-language material. The results show that among the three language features tested, the use of video plus subtitles has the greatest learning effect on phrases. But if it goes far beyond the audience's language capabilities, visual input can produce undesirable language gains, even with subtitles. Because "the processing required to understand is not the same as the processing required to acquire", learners tend to follow the principle of "least effort" in the context where their attention is mainly focused on understanding the meaning of an article or a conversation, without noticing the characteristics of the target language that differ from their current level of knowledge and use (Schmidt; Ellis; Lightbown et al) [19]. Many experiments also suggest the minimum language proficiency threshold for learners to benefit from captioning, or the need to carefully match the proficiency level and the linguistic difficulty of the audiovisual material [21]. To be understandable, input should only be slightly above the student's proficiency level [22].

4. Materials and Method

4.1. Theoretical Framework

A research study by Paul Gruba (2010) proposed a seven-category system. This framework, which is founded on constructivist understanding views, pertains to the interpretation of video text in second languages. The author aimed to explore the significance of visual components in a more comprehensive manner.

To fill the knowledge gap about how visual elements affect the understanding of L2 learners when they watch real video texts, this study first recorded three authentic Japanese news broadcasts and converted them into digital format for computer viewing. The second approach involved gathering immediate retrospective verbal reports. Through an iterative process of analyzing qualitative data, a comprehensive framework consisting of seven parts was developed to understand the role of visual elements in listening comprehension.

To accurately describe the actions of learners when using digital video media, the researchers selected 12 Japanese university students and provided them with three sets of digitized authentic Japanese news broadcasts. The selection criteria for the broadcasts were given specific limitations. The next step required the participants to instantly give an oral retrospective report in English, recording and transcribing their pre- and post-viewing thoughts.

In this qualitative study, the discussion is supported from two perspectives: a retrospective analysis from a constructivist viewpoint and a definition of video texts. The author expresses that video materials serve a dual purpose for learning and testing. The data obtained from the experiment is categorized into seven categories to construct a preliminary framework for describing learner's viewing behavior: (1) identifying text types, (2) initiating macro structure, (3) exploring tentative hypotheses, (4) confirming interpretations, (5) constraining or enhancing the presence of visual

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elements, (6) hindering the development of macrostructure, and (7) limited assistance provided by visual elements.

The research findings suggest that the way listeners focus on visual elements during the initial comprehension process of L2 video texts can be explained and expanded upon using a preliminary framework consisting of seven components. Although the author acknowledges that the framework is still far from being complete, it differs from the learner behavior perspective based on cognitive information processing models (e.g., Chamot). Instead, it is grounded in the recently proposed Constructive-Integrative Model of comprehension by Kintsch, which is considered current and defensible.

Furthermore, the intricate nature of this framework enables it to adapt to different learner behaviors. Building upon the research findings of various scholars, the author suggests that there is a requirement for a deeper comprehension of how auditory input and visual influences in diverse "visual cultures" impact the processes of learning and evaluation.

4.2. Visual Syntax in Images

In a study by Gunther Kress and Theo van Leeuwen, the exploration process of visual design grammar in image reading is summarized. The study uses Halliday's social semiotics framework and proposes three interpretation modes of images: representational meaning, interactive meaning, and compositional meaning. It suggests that these three descriptive modes are applicable not only to language but also to all representational modes of thinking, including images.

Initially, the writer clarifies what "grammar" actually means and why "visual grammar" is used. Grammar is thought of as a tool for social (inter)actions and experience forms' encoding and interpretation. The broad grammar of modern visual design in "Western" culture is referred to as "visual grammar". It is an explanation of the practices and explicit and implicit knowledge of a resource that consists of the components and guidelines of visual communication in a particular cultural form. Furthermore, the author feels that the lines separating written forms from visual arts must be redrawn. The article also documents the participants involved in the information exchange, represented as representative participants in the visual content/people, as well as interactive participants, who engage in the communication behavior. This portion of the content focuses on the narrative process, which is categorized into different types based on the types of vectors and the number and types of participants involved. The analyzed examples mostly come from newspapers and photographs. The explanation of how the content of the image places the audience in a given position also shows the direction of gaze, the gaze of the represented participants, the size of the scene, and the perspective, all of which play an important role in identifying the relationship between the represented participants and the interacting participants. Additionally, it provides an interpretation of the application of color differentiation and arrangement at different scales.

The author's inference on modality is characterized as "interpersonal" rather than "conceptual". Therefore, the conclusion is drawn that modal judgments in visual communication rely on what is considered "real (or unreal, or fearful)" in social groups that express the primary intention. Various resources are also provided as examples to illustrate the significance of visual design and the role of visual design techniques, with further elaboration on the function of color. The authors made a bold attempt to apply visual grammar to three-dimensional vision and motion images, expanding their research from static images to dynamic ones. In this section, they analyzed three aspects of this painting: concreteness, conceptualization, and composition, to demonstrate that "cognition and emotion are not opposing forces, but inevitably coexist."

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4.3. Comparing the Effects of Output Production and Input Enhancement on English Language Learning

In this study, Izumi, the relative learning of English by adult English learners is examined in relation to the potential facilitative effects of internal and external attentional devices, including output and visual input enhancement. The study specifically examines whether output-producing activities encourage learners to focus on and subsequently learn formal TL form elements in input, as well as whether any learning that is prompted by such output is comparable to the effects of visual input enhancement, which aims to draw learners' attention to problematic formal features in input.

As many L2 learners and teachers believe that language production, or output, is an important component of L2 learning, this study aims to investigate the effects of output, which differs from input, and its true role in L2 acquisition. A series of hypotheses were tested in a controlled experimental study, where output and exposure to enriched input were systematically manipulated. Computer-assisted reconstruction and reading tasks were used as a medium for presenting the target input materials.

In the report, English relative clauses were selected as the target form. The study assumes the existence of a typological relationship between different relativization types and the natural developmental sequence of relative clause acquisition. This was done to test the performance of teaching interventions in terms of sequence, timing, and evaluation. The study employed a pre-test and post-test design with four treatment groups and one control group. The treatment groups differed in terms of output requirements (denoted as ±0) and exposure to enhanced input (denoted as ±IE).

The dependent variables in this study include attention measures used to address the level of attention caused by output and input enhancement, as well as acquisition measures used to address the level of learning caused by respective processing. The factors included in the study are (a) two between-group factors - two levels of output conditions (+O and -O) and two levels of input enhancement conditions (+IE and -IE); (b) time as a within-group factor, with two levels of pretest and posttest; (c) two related measures - attention and acquisition.

After conducting experiments comparing input and output, researchers further explored whether the understanding of the output group was affected by their increased attention and processing of tables. The process measures and product measures used in this study provided some empirical evidence for the attentional function of output in the relative acquisition of English by adult L2 learners. Keeping with the research, it is hypothesized that (a) sensory detection of important formal elements, such as head nouns and relative pronouns, and (b) additional cognitive processes, especially integration processes, to connect and organize the relevant formal elements into a cohesive structure set, are the cognitive processes required for learning complex structures like English RC. The main findings are: (a) in English relative clause learning, students who undergo output-input processing outperform those who solely focus on comprehension; (b) contrary to the positive effects of output, visual input enhancement has no measurable effect on learning; (c) in conclusion, there is no evidence to support the hypothesis that the effects of input enhancement are equal to the effects of output enhancement.

5. Discussion

From the above three selected key works of literature, visual elements play a very important role in the use of audiovisual materials, image semantic expression, and input and output mechanisms in language acquisition, and also respond to the focus of this paper: the interactive characteristics of visual stimuli in the process of L2 acquisition or foreign language learning. Audiovisual materials are becoming more widely used in the process of L2 acquisition or foreign language learning, and research in this area is constantly exploring the necessity and importance of visual elements. Not only

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through comparison with auditory elements but also through different application scenarios to test, preliminary but effective basic models are also formulated according to before and after test experiments to guide a variety of directions for future research. In the investigation of visual elements, it can also be found that visual elements are not only used as the central focus for research but also used as reference objects to explore more potential correlation factors and scene applications [5].

When considering the more basic studies of visual language, we can better investigate the ways in which traditional data and multimodal language can be applied in conjunction with visual stimulation. Image presentation under visual grammar is becoming more and more prevalent in our social networks and media lives, and the field of second language acquisition and learning foreign languages is rife with video resources that make it impossible for us to ignore the significant influence of visual stimulation. Additionally, this is subtly altering our mental patterns and emotional resonance. This paper no longer focuses on the distinction of vision as a tool but combines it with perception and cognition, and summarizes the important results of the current research from the macro and micro levels respectively. Due to the extensive discussion and research of computer-assisted language learning (CALL) in L2 acquisition, the impact of digital game learning (DGBL) on L2 vocabulary acquisition (Hwang & Wu) has also been emphasized, and interaction under visual stimulation has become the focus of gamification as a language learning strategy. According to Werbach and Hunter, gamification is a strategy that constantly promotes motivation [22]. Applied gamification elements are used as part of the stimulation in the teaching process, simulating an independent environment to dissolve unnatural Kapps in non-native environments. Gamification and L2 Learning: Motivational Significance, Personality Factors Have a Significant Impact on the L2 Learning Process. Brown proposed several of them and argued that they contribute positively to the successful learning of an L2. These factors include emotional domains, self-esteem, inhibition, risk-taking, anxiety, empathy, extroversion, Myers-Briggs personality type, and motivation [2].

6. Conclusions

Even though significant recent research findings indicate that visual stimulation is somewhat associated with L2 acquisition or foreign language learning, further experimental investigation and testing are still needed to fully understand the link between visual stimulation from many perspectives. The review of current research in this paper is conducive to providing direction for future empirical research. In addition, from the current research literature, the possible negative impact of interactive amplification in the age of media under visual stimulation on L2 acquisition or foreign language learning has not been discussed too much, and it is hoped that more research will be carried out in the future, combining cognitive science and language analysis, to investigate a clearer and more comprehensive relationship between vision and language learning.

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