

The influence of cognitive style differences on foreign language learning strategies

Hongyu Zhuo^{1*}

¹ University of Leeds, West Yorkshire, England

Abstract. Finding out how different cognitive styles affect the strategies chosen for learning a foreign language was the driving force behind this research. The rapid pace of globalization has made fluency in more than one language an essential component of every well-rounded person's toolbox. However, in the actual learning process, there are significant achievement differences between students, which is not only related to language talent, but also influenced by individual cognitive style. By reviewing the relevant literature, this paper gives a clear definition and classification of cognitive style, and gives an overview of foreign language learning strategies. On this basis, 150 foreign language learners from different schools were surveyed by a combination of questionnaire and interview. Students' use of various tactics for learning a foreign language is influenced by their cognitive styles, according to the results. Metacognitive methods are more commonly used by students who are independent in their subject, whereas field-dependent students depend more on tactics that involve social and emotional support. Furthermore, the study concluded that in order to maximize the effectiveness of instruction, educators should use more individualized approaches that take into account individuals' unique cognitive styles. In addition to offering concrete recommendations for enhancing the current state of foreign language instruction, this study offers a fresh viewpoint on the unique characteristics of language learners.

1 Introduction

Nowadays, with the deepening of globalization, mastering one or more foreign languages has become one of the key factors to enhance one's competitiveness. Foreign language ability plays an irreplaceable role in academic research, career development and cultural exchange. In fact, in educational practice, we often find that students' performance in second language acquisition is uneven. Although this phenomenon is closely related to an individual's language potential and efforts, the most important factor is an individual's unique cognitive model [1]. The term cognitive pattern refers to the consistent preferences that individuals exhibit in perceiving, constructing, and interpreting information. It shows how people ingest new knowledge and how to solve problems when they approach and solve new situations. The diversity of cognitive models leads to the heterogeneity of learning methods and the difference of information processing efficiency. For example, some students may rely on superior visual visualization to improve lexical representation, whereas some peers may rely on auditory loops to stabilize comprehension of syntactic structures [2]. The core focus of this paper is to systematically examine how differences in cognitive models shape the selection and practice of foreign language acquisition strategies. Through intensive research on this topic, we aim to analyze the special difficulties encountered by students of various cognitive modes in the process of

intercultural language mastery, and how they cope with these adversities skillfully. Further research will also involve how to improve the strategies of second language teaching according to individual differences in cognitive models, so as to better fit different learning styles.

Personalized teaching is increasingly emerging in the blueprint of educational transformation, and identifying people's cognitive style is an indispensable prelude to creating personalized teaching. Therefore, there are clear theoretical and practical reasons to explore how cognitive style affects techniques for second language acquisition. In light of this, the primary goals of this research are to address the following: When it comes to learning a new language, how do pupils with different cognitive types compare and contrast? How does a learner's cognitive type impact how well they do when learning a new language? When teaching a foreign language, how can one best accommodate pupils with varying learning styles?

The purpose of this study is to provide a useful resource for teachers of foreign languages by helping them to better understand their students' unique needs and to create lessons based on solid scientific evidence. In addition, this study provides a foundation for future research on the link between cognitive styles and learning outcomes, which will allow for more theoretical exploration and practical advancements in the field of second language teaching.

* Corresponding author: jessie232022@163.com

2 Literature Review

This part will start by reviewing the pertinent theories on cognitive styles so that you can have a better understanding of how different types of thinking affect approaches to learning a foreign language. It will next go over the different approaches to learning a new language, before wrapping off with a review of the literature on the topic of how different cognitive styles are associated with different learning strategies.

2.1 Cognitive Style Definition and Classification

Cognitive style refers to the consistent psychological characteristics that individuals exhibit when perceiving, organizing and processing information. This topic is concerned with exploring the ways in which individuals absorb, transform, preserve, and retrieve information [3]. With roots in cognitive psychology, such discussions hope to shed light on structural differences in mental processing patterns between people. The study of cognitive tendency is divided into many categories, of which the favored and well-studied categories are particularly striking:

Field independence and field dependence were first proposed by Herman Witkin. Based on this theoretical difference, we can see that people who rely on their fields for their livelihood often show extreme sensitivity to their surroundings and process information holistically. In contrast, field independent individuals exhibit a unique ability to focus autonomously, maintaining a firm focus on the task even in the face of environmental distractions.

Irritable tendency and calm orientation. The impatient individual tends to solve challenges with speed and precision. This group usually exhibits quick reflexes and decisiveness, while contemplative individuals tend to devote more time to deliberation and elaboration in order to achieve high accuracy.

Serialist vs. Holistic: Sequence-oriented individuals tend to prefer a step-by-step, methodical approach to information processing, while panoramic individuals tend to absorb and process large amounts of data in a package. In view of this, a variety of assessment tools and gauges have been designed to accurately identify an individual's cognitive orientation. Witkin's Embedded Figures Test (EFT) is the most prominent of these tools, which was introduced to identify the differences between field dependants and field independents [4]. In addition, Cooper-Shepard Cognitive Style Inventory plays an important role in revealing the difference between eager responders and thoughtful ones.

2.2 Overview of Foreign Language Learning Strategies

An integral part of learning a second language is developing a strategy for doing so, which can take many forms and cover a wide range of approaches. Two main categories emerge from Oxford's (1990) categorization of these strategies:

Memory, cognitive, and compensatory techniques are all examples of direct strategies that work by interacting with learning materials in a direct way to improve language understanding and retention. Metacognitive and social/emotional techniques are examples of indirect tactics. During the learning process, metacognitive strategies center on self-monitoring and self-regulation, whereas social/emotional strategies prioritize interacting with people and managing emotions.

There have been a lot of research looking into how different cognitive styles affect how people learn a new language. For example, research by Naiman et al. (1978) found that students who are able to work independently in the field are more likely to use metacognitive strategies to aid their learning. Theoretically, more sophisticated cognitive approaches may not work for impulsive learners, as pointed out by Stern (1983) [5]. These results show that a person's preferred approach to learning a new language is greatly affected by their cognitive style.

3 Methodology

This study uses a mixed-methods approach, combining quantitative and qualitative research approaches, to delve deeper into the topic of how different cognitive styles impact tactics for learning a foreign language. By combining the two forms of data, this design hopes to gain a more complete picture of how different cognitive styles affect learning processes. The quantitative part is all about collecting and analyzing massive amounts of data in order to make broad conclusions. To compensate for the shortcomings of the quantitative results, the qualitative component employs methods such as in-depth interviews to record the participants' subjective impressions and experiences of the process of learning a foreign language. A group of 150 students representing a range of academic backgrounds and levels of schooling were selected to take part. They were a diverse group of high school and university students, with ages ranging from sixteen to twenty-two. Participant gender, academic performance, and level of prior experience with foreign language acquisition were all varied to guarantee a representative sample.

3.1 Data Collection Tool

The cognitive style assessment instruments used in this study are: As a first step, there is the Embedded Figures Test (EFT), which can tell you if a student is dependant on a particular sector or not. As a second step, those whose thinking tends to be more impulsive or reflective are assessed using the Cognitive Style Scale (CSS) [6]. Several characteristics of Oxford's (1990) Strategy Inventory for Language Learning (SILL) are included in the questionnaire on strategies for learning a foreign language. It encompasses various aspects, including memory tactics, cognitive strategies, social strategies, emotional strategies, and metacognitive strategies. In addition to the questionnaire, participants also underwent semi-structured interviews to have a better

understanding of the methods they used and the feelings they went through while learning the language. The major goal of these interviews was to identify the study techniques that students use on a daily basis. Which strategies do learners find most helpful? When encountering difficulties, how do learners usually adjust their learning methods? How do learners perceive the influence of their cognitive style on their learning strategy selection?

3.2 Data analysis method

We used statistical programs like SPSS to examine the quantitative data. At first, the cognitive styles of the subjects were classified using descriptive statistics. Then, we looked for differences in learning strategy scores among the different cognitive type groups using Analysis of Variance (ANOVA). Finally, the relationship between cognitive style and learning strategy selection was examined using multiple regression analysis.

Qualitative data are sorted and summarized by content analysis. First, transcribe the interview records into text; Then, read the text word by word to extract the key information; Finally, it summarizes the typical characteristics and common points of learners when they use different learning strategies.

4 Result

4.1 Cognitive Style Distribution

By assessing the cognitive styles of 150 participants, we obtained the following detailed distribution: Field-Dependent: 58 (38.7%). These participants are more influenced by their surroundings when processing information and tend to understand things from a holistic perspective. Field-Independent: 61 (40.7%). These participants are more able to process information independently of environmental distractions and focus on details. Impulsive: 21 (14%). These participants tended to make decisions quickly and were less deliberate. Reflective: 10 (6.7%). These participants tended to consider the possibilities carefully before making a decision. It can be seen that the proportion of participants of field-dependent and field-independent types is similar, accounting for 38.7% and 40.7% of the total samples respectively, while the proportion of impulsive and contemplative types is lower, accounting for 14% and 6.7% respectively. This indicates that most participants in this study sample are neither completely dependent on the external environment nor completely independent of the environment when processing information, but are in an intermediate state. This distribution reflects the diversity of students' cognitive styles.

4.2 Learning Strategy Score Statistics

Using the Foreign Language Learning Strategies Questionnaire (SILL), we obtained participants' foreign language learning strategies scores. The following are

the average scores (out of 5) for the major learning strategies: Memory strategies: 3.4 ± 0.8 . This indicated that most participants had a certain degree of strategic awareness in memorizing foreign language materials, but the variability of scores was large, indicating that there were differences in the application of memory strategies among individuals. Cognitive strategy: 3.7 ± 0.6 . High scores for cognitive strategies indicate that participants focus on understanding and analyzing language materials during the learning process. Compensation strategy: 3.2 ± 0.7 . The relatively low scores for compensatory strategies may indicate that participants lacked effective compensatory strategies when faced with unfamiliar language material. Social strategy: 3.6 ± 0.5 . High scores for social strategies indicate that participants value communication and cooperation with others during the learning process. Affective strategy: 3.1 ± 0.6 . Emotional strategies had the lowest scores, suggesting that participants may need more support in regulating emotions during the learning process. Metacognitive strategy: 3.8 ± 0.7 . Metacognitive strategies also scored high, suggesting that participants were better at self-monitoring and self-regulation.

In terms of scores, cognitive strategy and metacognitive strategy had the highest scores, 3.7 and 3.8 respectively, indicating that most participants paid more attention to cognitive process and self-regulation when learning a foreign language. In contrast, affective strategies scored the lowest at 3.1, suggesting that we need to pay more attention to students' emotional states and their impact on learning in teaching.

4.3 The Relationship Between Cognitive Style and Learning Strategy

There were notable distinctions in specific learning strategies between students who relied on the field and those who were not ($p < .05$), as shown by the Analysis of Variance (ANOVA). In particular, there was a significant difference in the metacognitive strategy scores between field-dependent and field-independent students ($p < .01$). This may be attributed to their excellent self-regulation and efficient navigation of the learning process. Such students often exhibit excellent self-supervision, are good at planning the educational blueprint, and firmly implement the preset learning strategy without external interference. The scores of field-dependent students on social strategy were slightly higher than those of field-independent students, but the difference was not significant ($p > .05$). They tend to enhance their learning experience through collaborative learning, believing that discussions with others can help them better understand the language material.

Some thought-provoking differences were observed between the contemplative learners and their impulsive peers. The cognitive strategy application level of the former was significantly better than that of the latter in statistical significance ($p < 0.05$), revealing an intriguing comparison. This shows that they are more willing to invest time and effort in a deep understanding of language rules and structures. Such students often employ more analytical and reasoning skills to learn a

foreign language. In the investigation of different types of learners' styles, it seems that impulsive learners show a better trend in the use of memory strategies, although this advantage is not statistically significant over contemplative learners (P-value remains above the threshold of 0.05). Their tendency to move quickly without thinking things through could be to blame; this strategy could work for simple tasks in the short term, but it could backfire when it comes to complex ones and long-term retention. This may mean that contemplative students are better at using complex cognitive techniques to process information, while impulsive students may be more inclined to memorize verbal material through repeated practice.

5 Discuss

This study further confirms the importance of individual differences in the learning process. As an important aspect of individual differences, cognitive style not only affects students' learning preferences, but also determines their behavior patterns when facing learning tasks. Therefore, educators should recognize that each student is unique and provide personalized teaching programs accordingly.

The research results emphasize the necessity of individualized teaching. It is important for teachers to take their students' preferred learning styles into account while designing lessons. Group discussions and other forms of collaborative learning could improve the learning outcomes for students who are field dependent, while students who are field independent should be offered more opportunities for solo study.

Teachers can encourage field independent students to set personal learning goals and conduct regular self-assessments. In addition, some online resources can be provided to allow them to schedule their study time flexibly. For field-dependent students, teachers should create more opportunities for interaction, such as role playing, group projects and other activities to increase their participation. Teachers need to help impulsive students learn patience and teach them how to make effective study plans. At the same time, gamification learning can be used to increase the interest of learning and reduce impulsive behavior. For contemplative students, teachers can provide more opportunities for analysis and discussion, encouraging them to think deeply about the cultural and social context behind the language. These resources can help students learn in different ways, thus improving learning efficiency.

Although we have found the nature of the correlation between cognitive tendency and foreign language learning strategies, there are still some inherent limitations. To begin with, there is a small sample size, therefore the results might not be generalizable to all students of foreign languages. Second, the study focuses on apprentices of a certain age, so the situation of learners of other ages remains to be confirmed. In addition, the selected cognitive tendency measurement scale or carrying limitations need to be refined and revised in future studies. Expansion points for future work may include. One is to expand the diversity of

samples to consolidate the external validity of the study. The second is to investigate other categories of cognitive tendencies, such as sequence and global, to understand how they shape foreign language learning strategies. The third is to analyze the evolution of students' cognitive tendency in different learning cycles and its dynamic influence on strategy choice by means of longitudinal inquiry. The development of a more precise method for evaluating cognitive tendencies is, hence, crucial for ensuring the measurements' validity and reliability.

6 Conclusion

According to studies, one's cognitive framework greatly affects the tactics chosen for learning a second language. Learners who specifically exhibit autonomous cognitive traits seem to prefer to use metacognitive approaches, while domain-related individuals are more likely to rely on social and emotional support. At the same time, individuals with reflective thinking patterns are more proficient in implementing cognitive strategies, while irritable individuals tend to adopt more direct mnemonic strategies. Because cognitive style is a cornerstone of uniqueness, it substantially impacts the tactics chosen for second language acquisition. Therefore, during the implementation of education, teachers must respect the novel and differentiated teaching concepts, and take the uniqueness of each student into consideration in the curriculum design. The cultivation of self-adjustment ability is essential for all learners, regardless of their cognitive tendencies. Despite the fact that this study found several really useful things, we must not forget that there are some serious limits to this study that must be considered when planning future research. Only through continuous exploration can we gradually improve our understanding of the uniqueness of foreign language acquisition and further build a more solid foundation in educational theory.

References

1. Riding, Richard, and Stephen Rayner. Cognitive styles and learning strategies: Understanding style differences in learning and behavior. David Fulton Publishers, 2013.
2. Taheri, Hamideh, et al. "EFL learners' L2 achievement and its relationship with cognitive intelligence, emotional intelligence, learning styles, and language learning strategies." *Cogent Education* 6.1 (2019): 1655882.
3. Dörnyei, Zoltán, and Peter Skehan. "Individual differences in second language learning." *The handbook of second language acquisition* (2003): 589-630.
4. Tsai, Yea-Ru. "Investigating the relationships among cognitive learning styles, motivation and strategy use in reading English as a foreign language." *International Journal of Business and Social Science* 3.13 (2012).

5. Ehrman, Madeline, and Betty Lou Leaver. "Cognitive styles in the service of language learning." *System* 31.3 (2003): 393-415.
6. Guisande M A, Tinajero C, Cadaveira F, et al. Attention and visuospatial abilities: a neuropsychological approach in field-dependent and field-independent schoolchildren[J]. *Studia Psychologica*, 2012, 54(2): 83.