Exploring the Core Difficulties of Second Language Spanish and English grammar and the AI Intervention Mechanism

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Abstract. This article compares and analyzes the core grammatical difficulties encountered in the acquisition process of English and Spanish as second languages, and explores the intervention mechanisms and application potential of artificial intelligence (AI) technology in this field. Previous studies indicate that English and Spanish exhibit essential differences in word order characteristics, tense and aspect systems, agreement and morphological changes, as well as preposition usage, which constitute unique acquisition challenges for each language. The difficulties of English grammar are mainly reflected in the categorical thinking of the tense system, the conceptualized use of articles, and the morphological habits of subject-verb agreement. To native Chinese speakers, the complicacy of verb conjugation, use of the pronominal, and rules that must be observed over the use of nouns in Spanish combined with the extremely grammaticalized subjunctive mood present more salient challenges to learning compared to other languages: Not only does it entail more effort to break down grammatical reasoning and full rule agreement when there is a need to remember them during live comprehension and expression, but it also demands that the multitude of fragmented grammatical point be stored in long-term memory. During recent years, the universal implementation of AI technology facilitated the breakthrough advancements.

1 Introduction

It is the language most familiar to the people and the language they use subconsciously in their minds when they think as well as, the mother tongue. The second language acquisition is the process through which learners acquire the language they did not learn when they were children. Since the first language is fully embedded in the minds of learners, the first language is bound to influence the acquisition of second language [1]. Nevertheless, as the extent of China's openness to the rest of the world has continued to increase, cross-regional and cross-ethnic language transfers have become more and more common. More and more language learners tend to learn another or even multiple foreign languages on the basis of already mastering one foreign language [2]. In the context of global language digital transformation,

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the acquisition research of English and Spanish, as the two most influential foreign languages worldwide, presents new characteristics with the intervention of AI. Among them, native Chinese speakers occupy an important position in both learning groups. However, Chinese lacks morphological changes and relies on word order and function words; English retains some morphology; Spanish has a rich morphological change system. This causes major difficulties to the Chinese learners when acquiring grammar since they must recreate their mental model of their first language to a general cognitive model of the second language. These difficulties are not merely reflected in the superficial differences in lingering form, but they are well entrenched in the difference in the way of thinking and in conceptualization. Most of the traditional second language acquisition research has concentrated on monolingual acquisition of either English or Spanish or used the native speakers of English learning Spanish as the main subjects, whereas systematic comparative studies with a specific focus on Chinese native speakers are relatively few. The speed of the development of the technology of artificial intelligence, in particular, the artificial legal language processing, machine learning, offers a new technological direction to reach more focused grammar instructions and feedback systems in recent years. Since intelligent error correction systems or adaptive learning paths can emerge, AI can offer individualized feedback in accordance with the background of the native language and special challenges different learners may face. As more technology and AI are being used, the possibilities of personalized learning exist together with the issues of authenticity, and the need to interact with a human person [3]. Current AI language learning applications are mostly built on the general grammatical challenges, not on the specific challenges faced by the native Chinese speakers. There should be better effectiveness and precision of their intervention. This research is expected to address this research gap by inducing comparative literature on the fundamental challenges faced by the native Chinese language speakers in mastering the English and Spanish grammar, critically examining the linguistic typological background and cognitive processes involved, and how AI technology can intervene specially to improve the effectiveness of acquisition.

2 Conventional problems with learning the Spanish grammar

2.1 Complexity of the system of verb conjugation

Spanish is characterized by complex verb conjugation, that incorporates the info about person and tense by conjugation, subjunctive and conditional moods also imply mood expression, making it easy to create barriers to the lowering and dictation [4]. This is one of the most typical grammatical events among the native speakers of Chinese in learning Spanish. Every verb can occur in dozens of person-tense-mood-aspect conjugates and many verbs experience irregular changes. For example, the present tense declarative conjugation of the verb "ser" is soy, eres, es, somos, sois, son, which differs greatly from the base form.

The verbs in Chinese are not conjugated at all, which makes the study of such a system a major memory challenge to the learners. It is not simply a matter of recalling the shapes, but quickly responding to the underlying shape in real-time communication. Chinese learners might still revert to the base form or rather the most familiar third-person singular form in instances of their minds being diverted or when relaying a complicated meaning in either oral speech.

2.2 Coherence between gender and the number of nouns and adjectives

Everything in the Spanish language has a grammatical gender: either a male or a female and is most likely signaled by an ending of -o and -a, although, again, exceptions tend to be

numerous, like el dia, la mano. The el/la, un/una, adjectives bueno/buena and some pronouns corresponding to it have to correspond in gender and number. In Chinese, the nouns lack grammatical gender expression; the gender is represented in the words used.

Errors that can be committed by learners should include failure to agree the adjective with the noun of gender or failure to use grammatical gender after considering the gender, e.g. using la persona (person, feminine) with a masculine referent because the learner assumes this may be a male. Mastering agreement requirements in gender and number requires remembering nouns as a whole of "article + adjective".

2.3 Subjunctive mood

The subjunctive mood is a unique expression form in Western languages [5]. Despite the robust performance of Large Language Models in various tasks, they face challenges with grammatical moods specific to non-English languages [6]. The subjunctive mood is not only used to express wishes, suggestions, and emotions, but also used to form negative clauses of fact, adverbial clauses introduced by specific conjunctions, etc. Its core function is to express the speaker's subjective attitude towards the truth of a proposition, such as doubt, possibility, unreality, etc. In contrast, Chinese does not have an equivalent grammatical system, nor does it possess such highly grammaticalized expression mechanisms. Instead, Chinese conveys similar semantic connotations through the collocation of modal verbs, the modification of modal adverbs, or by relying on the context of the surrounding text.

2.4 Pronoun system

The pronoun system in Spanish is flexible in position and rich in morphology. Besides nominative pronouns, there are also accusative pronouns serving as direct and indirect objects, which can be placed before conjugated verbs or after base forms of verbs. Furthermore, there is also the issue of the order of "double-object pronouns" when both dative and accusative pronouns appear together.

The Chinese pronoun system is relatively simple, with fixed positions, basically following the subject-verb-object order, and no case changes. The position and combination rules of Spanish pronouns pose difficulties for second language learners. For example, both "No te puedo decir" and "No puedo decirte" are correct translations of "I can't tell you", but the position of the pronoun "te" is different.

3. Traditional difficulties in English grammar acquisition

3.1 Categorical thinking transformation of the tense system

The tense system in English has long been a major difficulty for native Chinese speakers in their acquisition. Chinese primarily relies on adverbs of time and context to express temporal relationships, with verbs themselves not undergoing morphological changes. This fundamental difference requires learners not only to master formal markers such as past tense, present continuous tense, and perfect aspect in English verbs, but also to develop a way of thinking that views time as a linear division and categorizes it grammatically. Even at an advanced stage, Chinese learners may still oversimplify and use the simple past tense in contexts where the past perfect tense is required to express "the past of the past". For example, in the complex sentence "When I arrived, she had left", learners may mistakenly generate "When I arrived, she left", because in Chinese, the word "had" in "When I arrived, she had left" only indicates the temporal order, and the verb "leave" itself does not change.

3.2 Article system

The English article system consists of the indefinite article "a/an", the definite article "the", and the zero article. There is a very close correlation between the usage of the article system and its semantic functions. The indefinite article "a/an" primarily uses consonant or vowel phonemes as the distinguishing criterion, indicating the quantity of "one" or referring to a non-specific thing mentioned for the first time [7]. Chinese lacks the article as a grammatical category entirely, with similar grammatical functions expressed through words such as "this", "that", and "a", which are not mandatory. Therefore, the use of English articles by native Chinese speakers can be divided into two categories: one is the issue of article omission, stemming from the transfer of the absence of articles in their native language, and the habit of following the logic of Chinese expression without articles; the other is the misuse of articles, due to a lack of precise grasp of the rules for using articles, resulting in the confusion of definite and indefinite articles.

3.3 Subject verb agreement and third-person singular

English subject-verb agreement rule, particularly, addition of -s to third person singular present tense in verbs is a simple rule. This pattern of error however, does not vanish when the acquisition level goes on and even during the later stages of learning, it is still common. Verbs in the Chinese language also do not experience any change of person and number. Such morphological deficiency necessitates the learner to feature extra concentration on the individual and the number of the subject during the generation of English, and to incorporate morphology to the verbs. These mistakes frequently happen when the learners are preoccupied by means of forming the content and conveying the meaning, which means that the grammatical rule is not yet an automatic knowledge gained by learners. After proofreading even in the written format, it can reduce the rate of error, however, the errors made on rushing writing or complicated sentence structures will be revealed.

3.4 Disagreements in the use of preposition systems

Prepositions are frequently put in front of nouns, noun phrases, pronouns, and gerund in English. The signification and the role of a preposition is intimately connected with its localization and collocation within a sentence, because a great number of them consist of fixed combinations with nouns, verbs, and adjectives [8]. Despite that Chinese preposition system is highly developed, it lacks complete similarity to the English concepts. As an example, in English one can distinguish between time points, time periods and dates, in Chinese they are all governed by one preposition that is in. Spatially, on the table would be related to on the table, although on the wall can be on the wall (e.g. a poster); or in the wall (e.g. a window in the wall), depending on the manner of contact, and the relationship of contact.

As seen through the prism of cognitive linguistics, learning English prepositions implies that learning the prepositions involves learners having to rebuild their preexisting space and time conceptualizations. They must get to learn how the abstract relationships are concretized in English using various prepositions.

4 Comparison of grammatical challenges posed between English and Spanish, and their effects on the acquisition process of Chinese learners who are natives

4.1 Comparison of the nature of the difficulties, which are caused by the differences in the types of language

Regarding the linguistic typology, the essential dissimilarities in the grammatical challenges experienced by native speakers of the Chinese language when acquiring English and Spanish are based on the distance of the target language to the native tongue, and equally, the morphological complications inherent in the target language. In the case of English, the most difficult process is the necessary adjustment to the system of minimal morphological changes, and the main key is to learn the circumstances of usage of the core elements like verb tense, third person singular and comparison. This entails subjecting the learners to a deep-seated mental redefining of grammatical strains and correspondences of meanings, the creation of awareness of grammatical categories such as "tense" and such as articles that are not present or otherwise made in Chinese, and the adjustment to grammatical interconnections, such as subject-verb agreement.

In comparison, the acquisition of Spanish poses a challenge on its own. Spanish has a very high and regular morphological complexity which includes detailed and complex verb conjugation, noun grammar, and agreement in gender and number. This, in turn, gives the fundamental learning problem to the learners in developing and internalizing a system of systematic morphological change, ultimately automating the language production, memorizing and effectively using the multifaceted system of verb conjugation, learning the system of pronouns and their peculiar dependent forms. The most common challenges include conjugation of verbs in all the forms of the tense and persons, rigorous agreement of adjectives and nouns in numbers and gender, and change of position and form of the pronouns in the sentence. The two different paths of acquisition are essentially the basis of various needs of learners' cognitive capabilities and its implication is that technological tools like artificial intelligence must consider individual intervention approaches in offering its assistance.

4.2 Transference of mother tongue and cognitive variations

The mother tongue transfer is a term used to indicate the effect of the first language of a learner when language learning is happening. Even in this dynamic and dynamic area of linguistic studies, a more transformative view of the learning mechanisms and effects of mother tongue transfer will help clarify the mind process of language acquisition, giving both theoretical and practical advice on better second language acquisition by the individuals [9]. In second language acquisition, conceptual level and lack of morphological characteristics may be manifested in mother tongue transfer, which will aid in a better understanding of the language acquisition process. In the case of English, it can tend to appear on the syntactic and conceptual levels. In the case of Spanish, in addition to conceptual level, it is more profoundly represented in the lack of morphology characteristics. There is a possibility that learners will not pay much attention to conjugation and agreement in the initial stages as such systems do not exist in the mother language. In real-time language processing, the distribution of cognitive load is also different. English learners tend to focus more on a limited number of grammatical points and phrase combinations. Spanish learners, on the other hand, face a heavier cognitive load, as they need to search their mental lexicon for the correct conjugated forms of the core verbs in almost every sentence, while also coordinating the consistency between nouns, adjectives, and articles. This places considerable demands on learners' memory capacity. Definitely being the second language with the largest number of speakers in the world, Spanish has undergone a significant growth in the international impact on understanding grammar, along with its causes and effects on acquiring English and Spanish as the native language [10].

5 Intervention mechanism and application of AI technology in second language grammar acquisition

5.1 Intelligent grammar correction and refined feedback

The intelligent grammar correction system based on natural language processing and deep learning has been able to identify complex tense errors, misuse of articles, and subject-verb inconsistency in English. To the native Chinese speakers, the system should also incorporate contrastive error analysis that does not only identify the mistakes but also diagnoses the underlying cause which could be mother tongue transfer. In the case of Spanish, an error correction tool should be capable of working with errors in conjugation and have a full table of conjugations as a reference.

5.2 Intelligent learning platform and customised path planning

The adaptive learning system takes place through algorithms to plot paths for every learner. In the case of English studying among native Chinese, the platform may focus on the percentage of tense and article modules, and formulate the exercises between context perception and rule induction. In the case of the Spanish language, the main promotable activity of the platform is to create learning patterns of verb conjugation and vocabulary. The system modifies the review period and the exercise difficulty dynamically basing on reaction speed and correctness of the learners in the various conjugation tenses and gender-number agreement exercises so that the memory load will be within a reasonable range.

6 Conclusion

The globalization is extremely strong nowadays, and the interactions along with collaboration of various nations and cultures become more common. The role of language has become very prominent as a medium of communication. The present article is a systematized comparative and analytic argument, requiring the investigation of the peculiar challenges in the learning of the Spanish grammar as a second language, as well as its preconditions and outcomes in the overall production of English and Spanish as a native language. The problems in English are primarily related to the tense system, articles, and subject-verb agreement where the problem was to develop grammatical categories and obligatory agreement relations which are not present in the English language. The challenges in Spanish are associated with the reality of complicated verb conjugation and overall agreement with gender and numbers that will mean that learners will have to develop an entirely new system of processing morphologies. They both have radically changed the intellectual traditions of the native Chinese speakers. The adaptive learning and intelligent error correction tools, as the examples of AI technologies, offer the individual and directed assistance trajectories in order to manage such structural issues. They can also deliver real-time and comprehensive feedback and design individual learning goals. Nevertheless, even the existing studies have serious gaps in theoretical advice, efficacy verification, and interdisciplinary consideration. The next move would be to further understand the cognitive process of second language acquisition among native Chinese speakers and apply the same knowledge towards creating more intelligent technical tools which would be more in line with the cognitive patterns of second language learners as well as customized learning tools that could serve to promote the enhancement of advanced language proficiency.

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