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The role of native language translation in English language acquisition

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Abstract: This study investigates the role of native language (L1) transfer in English language acquisition among Chinese learners, employing a questionnaire-based survey of 329 participants across different proficiency levels. The findings indicate that L1 influence operates across multiple domains, with the most substantial effects observed in grammatical and discourse structures. Typological differences between Chinese—a paratactic language—and English—a hypotactic language—pose considerable challenges, particularly in writing logic and syntactic organization. Although learners frequently rely on literal translation and code-switching strategies, they demonstrate limited awareness of L1-induced errors in discourse production, revealing a noticeable divergence between self-perception and actual linguistic performance. Furthermore, the study emphasizes that learners show a stronger preference for immersive learning approaches over metalinguistic strategies, such as comparative analysis or self-regulatory monitoring. Based on these findings, the research advocates for a balanced educational approach: Deliberately leveraging the mother tongue as a resource to elucidate complex linguistic concepts and rules, while emphasizing English as the medium of instruction to immersively cultivate cognitive patterns in the target language. The conclusion underscores the importance of integrating metalinguistic training and technological interventions to effectively reduce negative transfer and support the development of interlanguage.

Keywords: native language transfer; English language acquisition; Contrastive analysis; interlanguage fossilization

1. Introduction

In today's increasingly globalized and cross-cultural world, English, as an international lingua franca, has become a key indicator of both individual comprehensive competence and national competitiveness. Particularly in China, English education has long held a central position, with a large and diverse learner population spanning various age groups and educational backgrounds. However, despite substantial investments of time and resources, many Chinese learners still face significant challenges in English output skills, such as oral expression and written composition. Research indicates that the native language (L1) plays a complex and critical role in second language acquisition—it may facilitate understanding through positive transfer, but it can also lead to errors due to negative transfer. Systematic typological differences between Chinese and English in phonetics, grammar, syntax, and even modes of



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thinking make Chinese learners particularly susceptible to L1 interference during English acquisition, manifesting in phenomena such as literal translation, mixed sentence patterns, and logical structure transfer. Therefore, a systematic investigation into the specific manifestations, cognitive mechanisms, and pedagogical responses to L1 transfer carries significant theoretical and practical value.

Through a systematic analysis of 329 valid questionnaires, this paper systematically examines the phenomenon of L1 (Chinese) transfer in English acquisition. It focuses on analyzing its manifestations across various linguistic dimensions (e.g., phonetics, vocabulary, grammar, discourse), the gap between learners' self-perception of transfer and their actual language production, as well as the learning strategies and instructional preferences they adopt. The study aims to elucidate the complexity of L1 transfer and its underlying mechanisms in English acquisition. Based on the findings, it proposes dynamically adaptive pedagogical recommendations that integrate metalinguistic awareness training and technology-assisted interventions, with the goal of promoting more effective English learning and interlanguage development.

The findings regarding learners' supportive attitude towards L1-assisted instruction resonate with the growing theoretical framework of Translanguaging (García [1]). Contrary to traditional monolingual approaches that seek to strictly separate languages, translanguaging posits that bilinguals have a unified linguistic repertoire and strategically draw upon all their language resources to make meaning and facilitate learning. This perspective reframes the mother tongue not as an interference to be eliminated, but as a valuable cognitive and semiotic resource (Canagarajah [2]).

2. Methods

2.1. Participants

The participants in this study are Chinese native speakers who are currently learning or have previously learned English, including university students and adult learners enrolled in language programs. The rationale for selecting this group lies in:

- Their shared native language (Mandarin Chinese), providing consistency in L1 influence.
 - The demographic characteristics of the participants, detailed in Table 1, confirm their broad representation in terms of age, education level, and English proficiency, which enhances the generalizability of our findings.
 - The accessibility and diversity of this demographic within academic and training institutions.
- A total of 329 valid questionnaires were collected and included in the final analysis.

2.2. Questionnaire design

The questionnaire comprises four main sections designed to gather comprehensive data. Section A: Demographic Information collects essential background details, including the participant's age, gender, education level, years spent studying English, and self-rated English proficiency (supplemented by standardized test scores if available). Section B: Native Language Influence investigates the self-reported impact of the participant's first language (L1, Mandarin Chinese) on various aspects of their English acquisition, specifically focusing on pronunciation, grammar, vocabulary, and writing. This section also explores specific instances of direct translation from L1 and inquires about the frequency of code-switching

behavior. Section C: Learning Challenges delves into the specific areas of English that participants find difficult, such as tenses, prepositions, and article usage. It solicits concrete examples where L1 interference has impacted their English learning and assesses the perceived severity of these challenges. Finally, Section D: Learning Strategies examines the participant's use of L1 for comprehension or translation purposes during English learning. It also asks about specific strategies employed to overcome L1 interference, such as shadowing, immersion techniques, or the use of bilingual dictionaries, and probes their attitudes towards bilingual instruction or receiving L1 support within English learning contexts.

The questionnaire employed in this study was self-developed, grounded in the theoretical frameworks of Contrastive Analysis and Interlanguage Theory. To ensure content validity, the initial item pool was reviewed by a panel of three experts in applied linguistics. Their feedback was incorporated to refine the wording, structure, and coverage of the items. A pilot study with 20 participants was subsequently conducted, which confirmed the clarity and appropriateness of the questionnaire.

The psychometric properties of the questionnaire were assessed using the data from the main study ($N = 329$). The internal consistency reliability for the entire scale was excellent, with a Cronbach's alpha coefficient of .89. An Exploratory Factor Analysis (EFA) using Principal Component Analysis with Varimax rotation was performed to examine the construct validity. The EFA yielded a four-factor solution that aligned with the intended structure of the questionnaire, corresponding to the four sections: (A) Demographic Information, (B) Native Language Influence, (C) Learning Challenges, and (D) Learning Strategies. These factors collectively explained 68.5% of the total variance. The KMO measure of sampling adequacy was .87, and Bartlett's test of sphericity was significant ($\chi^2 = 4520.18$, $p < .001$), confirming the data's suitability for factor analysis. These results collectively support the reliability and construct validity of the instrument for measuring L1 transfer phenomena among Chinese EFL learners.

2.3. Distribution procedure

The questionnaire will be distributed primarily through the online platform Wenjuanxing. The target audience encompasses university students and adult language learners across diverse regions in China. The distribution process follows a defined timeline: A pilot testing phase lasting one week will be conducted with approximately 20 participants to ensure the clarity, comprehensibility, and reliability of the questionnaire items. Following necessary refinements based on pilot feedback, the formal distribution phase will run for a duration of two weeks. The data collection deadline is set within 21 days from the initial release of the formal questionnaire. The final effective response rate reached 87.5%, with 329 valid responses retained for analysis.

3. Results

3.1. Analysis of respondents' basic information

The detailed demographic profile of the 329 participants is summarized in Table 1. The sample encompassed a wide range of ages, from under 18 to over 45, with the largest group being 18–22 years old (45.0%). Education levels were well distributed, including high school or below (18.8%), bachelor's degree (31.3%), master's degree (30.7%), and doctoral candidates (19.2%). Furthermore, participants' self-assessed English proficiency varied across the spectrum, from beginner (10.9%) to advanced (10.3%), with the

majority clustering at the intermediate level (79.0% combined for lower–intermediate and intermediate). This diversity confirms the sample’s heterogeneity across key demographic and proficiency variables.

Table 1. Demographic characteristics of participants (N = 329).

Characteristic	Category	Percentage (%)
Age	Under 18	5.5
	18–22	45.0
	23–26	32.5
	27–35	12.5
	Over 35	4.5
Education Level	High School or Below	18.8
	Bachelor’s Degree	31.3
	Master’s Degree	30.7
	Doctoral Degree	19.2
Self-rated English Proficiency	Beginner (1)	10.9
	Lower–intermediate (2)	48.9
	Intermediate (3)	29.5
	Upper–intermediate (4)	10.3
	Advanced (5)	0.3

Data on learning duration shows that 72.34% of learners were in the 3–6 year learning stage, 21.88% in the 7–10 year stage, and only 5.47% had studied for over 10 years. This distribution suggests that the research subjects are primarily intermediate to advanced English learners, at a critical period when language habits are forming and language sense is solidifying. According to Selinker’s Interlanguage Theory, the interlanguage system of learners at this stage is still forming, and fossilization phenomena begin to appear in language production (Selinker [3]). The influence of the mother tongue can manifest as either hindering negative transfer or facilitating positive transfer, providing an ideal sample base for studying mother tongue transfer phenomena. Furthermore, intermediate and advanced learners possess a certain degree of awareness of mother tongue transfer, enabling them to identify and report its manifestations in their learning, thereby enhancing the reliability and validity of the data.

3.2. Self – assessment of English proficiency and perception of mother tongue transfer

3.2.1. Results of English proficiency self–assessment

As shown in Figure 1, In the self–assessment of listening and speaking skills, 48.94% of respondents rated themselves as 2 (low), 29.48% as 3 (medium), 10.94% as 1 (lowest), and only 10.33% as 4 (high), with no one selecting 5 (highest). For reading and writing skills, 45.9% rated themselves as 2, 49.54% as 3, with a very low proportion (3.64%) in the high score range (4–5). This result is highly consistent with the performance of Chinese English learners in standardized language tests (e.g., CET, TEM), reflecting a widespread lack of confidence in productive skills (speaking, writing). Further analysis suggests that this phenomenon of low self–assessment may be related to several factors: firstly, an overemphasis on accuracy in teaching may heighten learners’ anxiety about errors; secondly, productive activities often occupy a low proportion of classroom time, leaving learners lacking sufficient practice opportunities; thirdly, cultural factors may lead some learners to prefer conservative self–assessments, avoiding the appearance of overconfidence.

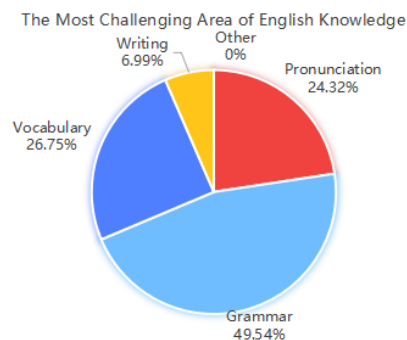


Figure 1. Challenges in English language learning: a breakdown of difficult areas.

From a skill development perspective, the lag in listening and speaking skills is particularly noteworthy. Listening comprehension involves multiple cognitive processes such as phoneme recognition, intonation perception, and real-time information processing. The differences between the Chinese and English phonological systems cause difficulties for learners in phoneme discrimination and processing connected speech. Oral production is more directly interfered with by the mother tongue's phonetics, rhythm, and intonation, easily leading to "Chinglish" intonation patterns. The self-assessment results for reading and writing reflect learners' deficiencies in grammatical complexity, lexical richness, and discourse coherence. Particularly in timed writing tasks, the influence of mother tongue thinking on logical organization becomes more apparent.

3.2.2. Perceived impact of mother tongue transfer across dimensions

Regarding the perception of transfer, the data reveal significant multidimensional characteristics. At the pronunciation level, 55.02% of respondents believed the mother tongue had a considerable influence, reflecting the pervasiveness of "accent fossilization" in phonetic acquisition. According to the Critical Period Hypothesis (Zhang [4]; Pang [5]), adult learners are at a disadvantage in phonetics acquisition and are prone to transferring their mother tongue's phonemic system and pronunciation habits to the target language.

Regarding grammatical structures, 47.42% of respondents reported a moderate degree of transfer influence, highlighting the impact of differences in sentence structure between English and Chinese on learning outcomes. English is a hypotactic language, relying on connectives and morphological changes to organize sentences, whereas Chinese is a paratactic language, tending to imply logical relationships through word order and contextual cues.

At the lexical level, 44.38% of respondents considered the influence significant, indicating that profound differences in semantic networks and conceptual systems across languages can substantially interfere with vocabulary acquisition through negative transfer effects.

Particularly noteworthy is the dimension of writing logic: 45.59% perceived a medium influence, 32.83% a considerable influence, and 10.03% an extreme influence. This finding reveals the profound impact of Chinese thinking patterns on English discourse organization. Kaplan [6] Contrastive Rhetoric theory points out that Eastern learners tend to adopt a "spiral" logical progression, while Western writers prefer a "linear" argumentative structure.

3.3. Frequency of mother tongue transfer behaviors and error cognition

3.3.1. Prevalence of literal translation

A high percentage of 60.79% of learners admitted to literal translation (14.89% frequently + 45.9% sometimes), reflecting the deep involvement of mother tongue thinking in the language production process. Literal translation occurs not only at the lexical level, but also in syntactic structures and expressions. This phenomenon indicates learners' insufficient internalization of the English language system, still relying on the conceptual framework of their mother tongue for encoding, and also suggests that their cross-linguistic awareness needs improvement.

3.3.2. High frequency of Chinese – English mixing

As shown in Figure 2, 63.83% of respondents “occasionally” mixed Chinese and English words in communication, and 18.84% did so “frequently”. This code-switching phenomenon is both a natural result of language contact and reflects learners' strategic avoidance when facing lexical retrieval difficulties. From a sociolinguistic perspective, Chinese–English mixing is an expression of bilingual language ability; however, in formal language use contexts, excessive mixing may affect communicative effectiveness and linguistic purity. From a psycholinguistic perspective, mixing indicates that the semantic networks of Chinese and English in the learner's mental lexicon are not fully separated, making non-target language activation likely.



Figure 2. Frequency of mixing Chinese and English cultural vocabulary in English communication.

3.3.3. Cognitive bias regarding errors caused by mother tongue thinking

76.6% of respondents denied that their Chinese thinking led to errors in their foreign language expression, a finding that contrasts sharply with the features of mother tongue transfer observed in their actual linguistic behavior. This divergence between perception and behavior may stem from several factors: first, the influence of L1 transfer often occurs subconsciously, making it difficult for learners to self-detect; second, current foreign language education remains inadequate in cultivating metalinguistic awareness, resulting in a lack of systematic understanding regarding the sources of errors; third, learners may apply different criteria in defining what constitutes an “error”, whereby noticeable transfer manifestations (such as literal translation or Chinglish syntax) are not regarded as mistakes, but rather as effective communication strategies. These observations suggest that it is essential to introduce more

systematic error analysis training in teaching to enhance learners' sensitivity and ability to recognize mother tongue interference.

3.4. *Most challenging areas and coping strategies*

3.4.1. Discourse-level challenges often underestimated

Grammar was identified as the most significant challenge by 49.54% of learners, highlighting the acquisition difficulties resulting from typological differences between English and Chinese. Features of English such as morphological changes, tense systems, and subject-verb agreement differ fundamentally from the grammatical structure of Chinese, and these structural disparities constitute a major obstacle for learners. In comparison, challenges related to pronunciation (24.32%) and vocabulary (26.75%) were perceived as relatively minor, while writing (6.99%) was regarded as the least difficult area.

However, this perception shows a significant asymmetry with the actual manifestations of transfer influence. Although writing was selected by the fewest as the most challenging area, it exhibited the most significant influence in the transfer impact dimension. This cognitive bias suggests that learners may not yet fully realize the severity of discourse-level transfer, often attributing problems in writing to insufficient grammar or vocabulary without recognizing the deeper differences in thinking patterns and discourse organization. This phenomenon also reflects insufficient attention to discourse-level transfer in current teaching, where teachers and students focus more on sentence-level accuracy, neglecting coherence and cohesion in text structure.

3.4.2. Preferences in coping strategies

In terms of learning strategies, 70.52% of learners prefer an immersive learning approach, whereas the utilization of English-English dictionaries (11.85%) and participation in full English courses (2.74%) are significantly lower. This strategic preference reflects typical characteristics of the foreign language learning environment in China: abundant input resources but relatively limited output opportunities, leading learners to rely more on passive reception rather than active production. From the perspective of second language acquisition theory, although immersive learning can enhance language sense and exposure frequency, its effectiveness in inhibiting L1 transfer may be limited due to the lack of explicit contrastive analysis and metalinguistic reflection. In contrast, using English-English dictionaries and engaging in full English courses can encourage learners to switch thinking patterns and reduce reliance on their native language. However, their low adoption rate also indicates learners' insufficient awareness of these strategies or psychological resistance due to perceived difficulty. This also reflects the multidimensional impact of cognitive processes on L1 transfer (Shao [7]).

3.5. *Attitudes towards mother tongue assistance in teaching*

As shown in Figure 3, the majority of respondents supported the use of Chinese in English language teaching: 22.49% "strongly support", 51.67% "support", 22.8% "remain neutral", and only 3.04% "oppose". This indicates that learners widely recognize the positive role of their mother tongue in comprehending complex language points, reducing anxiety, and promoting cognitive coherence. It also aligns with the pedagogical concept of "Translanguaging Theory" (Wu *et al.* [8]), contrary to traditional

approaches that completely exclude it. The use of the mother tongue, particularly when explaining complex grammatical structures, abstract concepts, or cultural contexts, can serve as a bridge to comprehension, facilitating students' understanding of the new language and thereby helping them internalize foreign language knowledge more efficiently based on their existing cognitive foundation. However, the use of the mother tongue must be carefully moderated, as excessive reliance may impede the development of English thinking patterns and even reinforce negative transfer.

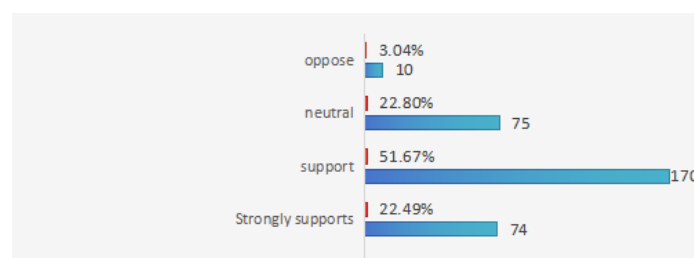


Figure 3. Attitudes towards using Chinese to assist English teaching.

3.6. Qualitative analysis of L1 transfer in writing samples

To complement the quantitative findings and provide concrete illustrations of L1 transfer, we conducted a thematic analysis of written responses provided by participants. Several salient themes emerged:

- Theme 1: Subject–Pronoun Dropping: Influenced by Chinese topic–prominent characteristics, learners frequently omitted subjects in their English sentences (e.g., “Is raining” instead of “It is raining”).
- Theme 2: Collocational Transfer: Learners directly translated Chinese collocations into English, resulting in awkward phrases (e.g., “learn knowledge” from the Chinese instead of the idiomatic “acquire/gain knowledge”).
- Theme 3: Paratactic Logic in Discourse: Essays often lacked explicit logical connectives, reflecting the paratactic nature of Chinese. Ideas were juxtaposed without the subordinating conjunctions typical of English (e.g., using simple commas to connect clauses that require “because” or “although”).

These examples vividly corroborate the statistical trends observed in Sections 3.2–3.4, demonstrating that L1 transfer is not an abstract concept but a tangible phenomenon in learner output.

4. Comprehensive discussion

4.1. Multidimensionality and complexity of mother tongue transfer

This study confirms that mother tongue transfer exerts a substantial influence across multiple levels, including phonetics, vocabulary, grammar, and writing. Particularly in grammar and writing logic, the fundamental differences between the paratactic nature of Chinese and the hypotactic structure of English lead to noticeable difficulties for learners in information organization, usage of connectives, and construction of complex syntactic formations. At the lexical level, mother tongue transfer manifests primarily as literal translation and semantic confusion; at the phonetic level, it is reflected mainly through phoneme substitution and negative transfer of intonation patterns. It is noteworthy that mother tongue transfer is evident not only on the surface level of linguistic forms but also penetrates deeply into modes

of thinking and cognitive frameworks, highlighting a close interaction between language and thought. Future research could further incorporate cognitive linguistic theories to explore the mechanisms of conceptual transfer in second language acquisition.

4.2. Trends and shortcomings in learning strategies

Although learners commonly adopt immersive learning strategies, the usage rates of more challenging strategies, such as using English–English dictionaries and attending English–only courses, are low, reflecting insufficient Self–Regulation strategic awareness. It is recommended to strengthen strategy training in teaching to enhance learners’ ability to identify and regulate mother tongue interference. Simultaneously, learners should be guided to shift from passive reception to active contrastive analysis, enhancing their sensitivity to structural differences through explicit language comparison exercises. Classroom activities could incorporate tasks such as Chinese–English comparative translation, error analysis discussions, and meta–linguistic reflection journals to promote learners’ awareness and control of transfer phenomena.

4.3. Teaching implications: mother tongue as assistance, not dependence

The strong learner preference for judicious mother tongue support in the classroom challenges the efficacy of rigidly monolingual (“English–only”) pedagogies. This finding aligns with the principles of Translanguaging pedagogy (García *et al.* [9]), which advocates for the strategic and purposeful use of students’ entire linguistic repertoire to deepen understanding and access complex content. As Creese *et al.* [10] demonstrated, such an approach can create a more inclusive and effective learning environment. Therefore, rather than viewing L1 use as a crutch, educators can consciously design tasks that leverage it as a scaffold—for instance, using Chinese for complex metalinguistic explanations or brainstorming ideas, before guiding students to “repackage” their thoughts into appropriate English forms, a process akin to conscious cognitive code–switching.

Teachers should reasonably utilize the mother tongue for contrastive analysis and explaining difficult points, Design and difference contrast teaching method (Zhang [11]), while gradually guiding learners towards English thinking, achieving “mother tongue support” rather than “mother tongue dependence”. Teaching should focus on discourse–level transfer phenomena, helping students realize the potential influence of Chinese thinking on English writing logic, and strengthening discourse organization ability through model text analysis, logical connective training, *etc.* Furthermore, pronunciation teaching should emphasize the training of suprasegmental features (stress, rhythm, intonation), grammar teaching should highlight English–Chinese structural comparisons, and vocabulary teaching needs to focus on collocational and semantic prosody differences.

4.4. Asymmetry between learners’ self–perception and actual performance

The study found that learners generally underestimated the impact of mother tongue transfer at the discourse and logical levels in their self–assessments. Particularly, although writing was perceived as the least challenging area, it showed the most significant influence in transfer perception. This disconnect between cognition and reality suggests that educators need to strengthen students’ meta–linguistic awareness, help them identify implicit transfer phenomena, and enhance their self–monitoring ability

through reflective practice. Teachers can use methods such as recording, writing sample analysis, *etc.*, to allow learners to visually understand the characteristics of their own language production, and combine peer review and teacher feedback to enhance their ability to identify transfer phenomena.

4.5. *New characteristics of mother tongue transfer in technological environments*

In technology-enhanced learning environments, the manifestation of mother tongue transfer may become more complex, necessitating corresponding adaptations in instructional strategies. As new language-use contexts such as online learning and human-computer interaction continue to expand, mother tongue transfer may exhibit distinctive features within these settings. For instance, the widespread use of machine translation may encourage word-for-word translation tendencies, while the application of speech recognition technologies could reinforce negative transfer effects in phonetics. Therefore, future research should focus on the influence of technological media on mother tongue transfer and develop corresponding interventional strategies for pedagogy. Additionally, educational technology developers could consider designing language learning software equipped with contrastive analysis capabilities to assist learners in identifying and correcting transfer errors during human-computer interaction.

5. Future directions: towards a dynamic-adaptive pedagogy for L1 transfer

This study has systematically examined the multifaceted role of native language (L1) transfer in the English language acquisition process among Chinese learners, drawing on empirical data from a substantial sample of 329 participants across varying proficiency levels. Confirming its pervasive influence from phonology to discourse, a phenomenon robustly documented in interlanguage theory (Selinker [12]). However, moving beyond mere confirmation, our findings reveal a critical and often overlooked cognitive-pragmatic disconnect: learners heavily rely on L1-mediated strategies (e.g., literal translation, code-switching) while simultaneously demonstrating a deficient metalinguistic awareness to monitor and correct the resultant errors. This paradox underscores that the core challenge is not merely linguistic interference but a deficit in cognitive monitoring and adaptive strategy use.

The prevailing preference for passive immersion over active contrastive analysis suggests that current learning environments fail to equip learners with the necessary metacognitive tools to harness their L1 strategically. Therefore, we argue for a paradigm shift from a static view of transfer (as something merely to be avoided) to a dynamic and adaptive one. In this new paradigm, L1 is reconceptualized not as a crutch or an obstacle, but as a diagnostic tool and a scaffolding cognitive framework that, when used with explicit guidance, can facilitate deeper metalinguistic comparisons and accelerate the restructuring of the interlanguage system.

Building on this, the author proposes two innovative directions for pedagogy and research:

5.1. *The integration of generative AI as a “contrastive companion”*

The study hints at the role of technology in potentially exacerbating transfer (e.g., through literal machine translation). Instead of resisting this trend, pedagogy can innovatively co-opt it, aligning with emerging research on AI in SLA. We propose the development and use of AI-powered contrastive analysis tools, Providing Balanced Feedback (Seddik [13]). For example, it can automatically create parallel corpora of native and target languages, and visually display structural and conceptual differences.

5.2. Implementing a “cognitive code switching” pedagogy

Rather than aiming for the often–unrealistic ideal of complete “English–only” thinking, we advocate for teaching the skill of conscious cognitive code switching (Kheder [14]), extending the principles of contrastive rhetoric into the cognitive domain. Teaching students to recognize the “paratactic” (Chinese) vs. “hypotactic” (English) thought patterns as different modes for different contexts (Kaplan [6]). Designing “mode–switching” exercises: For instance, students first brainstorm in Chinese to leverage conceptual depth, then are systematically guided through a “rhetorical translation” phase to switch to English discursive norms. It also encouraging learners to verbalize their thought processes during composition, explicitly stating when and why they are “thinking in Chinese” and how they are attempting to “repackage” that thought.

6. Conclusion

In conclusion, the future of mitigating negative L1 transfer lies not in suppressing the mother tongue but in leveraging it intelligently through technology–enhanced, metacognitively–driven pedagogical interventions. By transforming the learner’s relationship with their L1 from one of subconscious interference to one of conscious, analytical comparison, we can foster more adaptive and sophisticated interlanguage systems. Future research should empirically validate the efficacy of such dynamic–adaptive approaches, particularly focusing on their long–term impact on written discourse and spoken fluency.

Declaration of generative AI and AI–assisted technologies

The authors did not use generative AI or AI–assisted technologies in the writing of this manuscript.

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Authors’ contribution

Conceptualization, writing—original draft preparation, Jiayi Zhong. All authors have read and agreed to the published version of the manuscript.

Conflicts of interest

The authors declare no conflicts of interest.

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