

Article

First and Second Language Transfer in Korean Lexical Production of Chinese-English-Korean Trilinguals

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Abstract: This study employs the comparative-inductive method prevalent in research on cross-linguistic transfer within multilingual production. Taking Chinese, English and Japanese writing samples collected from nine student participants as research data, it conducts cross-text comparisons to investigate lexical errors in trilingual Japanese writing and clarify core issues including the sources and frequency distribution of first-language (L1) and second-language (L2) transfer. The results demonstrate that content words yield a higher overall error rate than function words. Statistically significant differences exist in error rates among subcategories of content words (namely nouns, verbs, adjectives and adverbs), whereas no significant differences are detected within the category of function words, which consist of auxiliary verbs, particles and other function-word items. From an individual learner perspective, both L1 and L2 transfer exhibit considerable individual variability in the use of either content or function words, with far more prominent divergence observed in content word usage. On the whole, content words involve a higher proportion of cross-linguistic transfer than function words, and instances of L1 transfer appear substantially more frequently than those of L2 transfer.

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1. Introduction

Amid the burgeoning research on third language acquisition, cross-linguistic transfer triggered by the first language (L1) and second language (L2) during target language production has evolved into a central research topic in academia (Cenoz et al., 2001; Peukert, 2015; Angelovska & Hahn, 2017; Cai, 2020, 2021). Existing studies on third language acquisition mainly revolve around lexical and grammatical dimensions, and analyses of cross-linguistic influences at the grammatical level are fundamentally grounded in the rules of lexical acquisition. Overseas research on lexical transfer in trilingual production has an earlier origin, with a primary focus on the source attribution and constraints of lexical transfer (Dewaele, 1998; Cenoz, 2001; Lindqvist, 2010).

Though relevant domestic empirical studies have gradually emerged, most extant research takes English as the target third language for investigation (Chen & Li, 2018). Such studies only indirectly infer the transfer effects of background languages based on trilingual vocabulary test scores, failing to conduct refined and concrete analyses of transfer manifestations in lexical production. A small number of studies concerning lexical acquisition with Chinese or Korean as the third language adopt a psycholinguistic paradigm and center on the cognitive processing mechanisms of lexis (Zhang & Lu, 2016). To date, there remains a research gap in specialized empirical studies examining lexical transfer in written Korean production among Chinese–English–Korean trilingual learners.

Most existing studies identify transfer errors solely based on target-language output and researchers' subjective intuition, without standardized, repeatable coding workflows. This limitation weakens the objectivity and rigor of their analytical frameworks (Cenoz, 2001). In view of the aforementioned research gaps and methodological deficiencies, the present study recruits Chinese–English–Korean trilingual learners as participants and adopts a case study design. It simultaneously collects participants' written compositions on identical topics and retrospective think-aloud protocols. Adopting Cai's (2022) comparative-inductive framework for multilingual transfer analysis, this paper systematically examines L1 Chinese and L2 English transfer in Korean content and

function word production. Empirical data are further utilized to verify and rethink existing theoretical models of third language transfer.

In the present study, the term “transfer” exclusively refers to negative cross-linguistic transfer, namely inappropriate lexical usages, errors and miscollocations induced by interference from L1 Chinese or L2 English during L3 Korean production. Positive transfer is not covered or analyzed within the current corpus, so “transfer” is used uniformly throughout the manuscript to denote negative cross-linguistic interference to avoid confusion.

2. Literature Review

2.1. *The L2 Status Model and Western Empirical Evidence of L2-Dominant Transfer*

When trilingual learners produce lexical items in their third language (L3), they are susceptible to cross-linguistic interference stemming from their first language (L1) and second language (L2). Accordingly, identifying the source of transfer in L3 lexis bears vital theoretical and empirical significance. Existing research generally judges the cross-linguistic triggers of lexical errors by matching deviant lexical forms in L3 production with equivalent expressions in background languages (Cai, 2021: 94). A wealth of empirical evidence reveals that most L3 lexical errors originate from the L2 rather than the L1, which lends support to the L2 Status Model. This theory posits that during the initial phase of third language acquisition, the L2 exerts substantially stronger interfering effects on target-language production than the L1 (Cai, 2020). Dewaele (1998) conducted an empirical investigation with 39 Dutch native multilingual learners split into two subgroups: 32 participants took French as their L2 and English as their L3, while the remaining 7 had English as their L2 and French as their L3. Target-language data were collected via multimodal tasks including French discussions, interviews and debates, with a focus on analyzing learners’ creative neologisms—self-coined words whose phonological and morphological forms resemble target-language norms yet violate native usage conventions. Statistical results indicated that among French L3 lexical errors, 21.8% of interferences stemmed from L2 English, whereas merely 6.9% were attributable to L1 Dutch. Subsequent studies by De Angelis & Selinker (2001) and Schepens et al. (2016) further corroborated that the L2 constitutes the primary source of cross-linguistic transfer in multilingual acquisition.

2.2. *Typological Distance and Orthographic Constraints: Contrasts Between Indo-European and East Asian Script-Sharing Languages*

Meanwhile, a body of research has validated linguistic distance as a pivotal moderating variable of transfer sources: if the L1 bears closer genealogical affinity to the L3, L1 transfer will outweigh L2 transfer in L3 production (Cenoz, 2001). Cenoz (2003) specifically explored how typological distance constrains lexical activation mechanisms in L3 acquisition. Eighteen Spanish–Basque–English trilingual learners completed picture-based narrative tasks, whose narratives were fully recorded and transcribed to systematically extract transfer instances. In this paper, transfer is defined as the act of directly borrowing non-target-language lexemes or adapting non-target lexical forms for use in L3 production. Statistical analysis of 42 transfer errors showed that 78.6% (33 cases) derived from Spanish and only 19% (8 cases) from Basque. Transfer triggered by Spanish covered both content words and function words, while Basque-induced transfer rarely involved function words. Cenoz attributed this discrepancy to linguistic genealogy: Spanish and English both belong to the Indo-European family and thus feature shorter typological distance, whereas Basque is a language isolate with no genetic relation to English.

The above findings are mostly derived from Indo-European samples; East Asian multilinguals who share Chinese character scripts show distinct transfer patterns driven by orthographic similarity. At the lexical processing level, Hayakawa & Tamaoka (2012) adopted a lexical decision task to compare the responses of native Chinese and native Korean speakers to visually and auditorily presented Japanese two-character Sino-Japanese compound words when learning Japanese as a target language. Their results revealed that native Chinese speakers exhibited significantly longer reaction times for Japanese words sharing identical orthography and semantics with their L1 Chinese equivalents (i.e., cognate homographs), relative to dissimilar Japanese lexical items, demonstrating an inhibitory effect. By contrast, native Korean learners displayed no such interference pattern. This divergence suggests that when the L1 and L3 share a writing system (Chinese characters), high formal resemblance does not necessarily yield processing advantages; instead, competitive lexical activation may trigger cognitive inhibition. This finding offers a distinctive perspective for cross-writing-system transfer research.

Along parallel lines, a KAKENHI research project led by Tamaoka Katsuo et al. (2013–2015) at the National Institute for Japanese Language and Linguistics employed event-related potential (ERP) electroencephalography. The study found that L1 Chinese homographic equivalents are automatically and non-selectively activated when Chinese–Japanese bilinguals process Japanese kanji compounds, yet the brain deploys dedicated filtering mechanisms to suppress interference from the non-target language. This neurocognitive evidence further corroborates the hypothesis of automatic co-activation of non-target languages during L3 lexical processing.

At the discourse level, Wang, Shi & Shen (2025) utilized natural language processing (NLP) to analyze cohesive features in Japanese compositions written by Chinese and Korean learners of Japanese. The results indicated that Korean learners' Japanese writing approximated native Japanese norms more closely in terms of the frequency and distribution of cohesive devices. The researchers attributed this pattern to the greater surface-structural similarity between Korean and Japanese discourse, including case particles and conjunctive markers. This conclusion aligns with findings from Xu, Cai & Yang (2025) on Chinese–English–Japanese trilinguals, who identified interlingual similarity as a core moderator shaping transfer directionality: similarity between L2 (English) and L3 (Japanese) exerted negligible transfer effects, whereas typological overlap between L1 (Chinese) and L2 (English) significantly modulated the occurrence of positive and negative L1 transfer.

Taken collectively, these recent East Asian empirical studies demonstrate that L3 transfer does not follow a straightforward linear relationship where greater linguistic distance correlates with stronger transfer. Instead, cross-linguistic transfer at lexical, syntactic and discourse strata is multiply modulated by orthographic properties, learners' L1 backgrounds, and experimental task modalities. Specifically regarding Chinese–Korean lexical activation, future research must further disentangle the distinct mechanistic roles of formal similarity and functional similarity during lexical access.

2.3. Moderating Factors of Cross-Linguistic Transfer: L3 Proficiency and Trilingual Semantic Activation Mechanisms

Furthermore, learners' L3 proficiency modulates the type and frequency of transfer occurrences. Navés et al. (2005) and Lindqvist (2009) observed rampant form-based transfer at early L3 acquisition stages, whose cross-linguistic interference gradually recedes as learners advance in target-language proficiency. Lindqvist (2010) supplemented this finding by demonstrating that meaning transfer based on semantic mapping becomes the dominant error type in oral production among advanced L3 French learners.

Complementarily, psycholinguistic research targeting Chinese–English–Korean trilinguals further unpacks the underlying semantic activation mechanism of cross-linguistic interference. Ma and Shi (2025, 2026) adopted cross-language repetition priming paradigms to explore semantic access within the trilingual mental lexicon, verifying that shared Sino-Korean lexical semantics enable automatic L1 Chinese semantic priming during L3 Korean production, which provides a cognitive explanation for the prevalence of L1-induced lexical negative transfer observed among beginner Korean learners.

2.4. The Developmental Model of Trilingual Production and Research Gaps in Sino-Korean Lexical Transfer

Beyond quantitative empirical examinations, scholars have also constructed theoretical frameworks to account for the activation hierarchy of background languages in L3 production. Drawing on oral data from one English–German–Swedish trilingual speaker, Williams & Hammarberg (1998) identified abundant code-switching instances. Non-pragmatic code-switching was predominantly triggered by German and concentrated within function word categories. To interpret this phenomenon, the two scholars proposed the Developmental Model of Trilingual Production, which distinguishes two distinct functional roles of background languages. The L1 serves as a metalinguistic instrumental tool in L3 production, while the L2 acts as the default lexical supplier that provides fundamental materials for L3 lexical construction. Once the L2 establishes its role as the primary supplier, it becomes co-activated with the target language and emerges as the leading source of transfer. During most developmental stages of L3 acquisition, learners experience activation interference from L2 lexemes when constructing interlingual lexical forms. As L3 proficiency improves continuously, the target language gradually undertakes both instrumental and lexical supply functions, and L2-induced lexical transfer decreases drastically at advanced acquisition stages. Lexical items undergo automatic mental processing with low cognitive control. When L1/L2 lexical activation strength is equal, function words more easily evade cognitive suppression and interfere with L3 output.

In summary, existing theories yield contradictory predictive logic for trilingual constellations such as Chinese–English–Korean, where the L1 and L3 share high typological relatedness. In line with the L2 Status Model and the Developmental Model of Trilingual Production, Korean lexical production should be primarily affected by L2 English transfer. Nevertheless, Chinese and Korean share an extensive inventory of Sino-Korean vocabulary, creating shorter linguistic distance between them, which generates the opposing hypothesis that L1 Chinese functions as the dominant transfer source. In addition, the differentiated transfer patterns of content words versus function words in L3 lexical production have not been fully addressed through empirical evidence, leaving a notable research gap in the field.

3. Research Design

3.1. Research Questions

The influence of background languages on L3 lexical items varies across different stages of third language acquisition (Navés et al., 2005; Lindqvist, 2009). Given the lack of targeted research on this topic in domestic academia, as a research member of the key National Social Science Fund Project *Multidimensional Dynamic Research on Language Transfer in Dual Foreign Language*

Learning, the author intends to conduct a longitudinal study on lexical transfer in Korean production among Chinese–English–Korean trilingual learners. As the first phase of this longitudinal research, the present paper adopts a case study approach to examine lexical misuse at the beginner stage of Korean learning, with a focus on linguistic transfer (hereinafter referred to simply as “transfer”) manifested in erroneous production of Korean content words and function words. Three specific research questions are proposed as follows:

- (1) What are the total occurrences and accuracy rates of content words and function words in Korean compositions written by Chinese–English–Korean trilingual learners?
- (2) What individual variations exist in the quantity and source of transfer associated with Korean content words and function words?
- (3) What discrepancies can be identified in the quantity and source of transfer between content words and function words in Korean written production?

3.2. Participants

The participants consist of nine first-year Korean majors enrolled in 2023 at a provincial university. All participants are native Chinese speakers with English as their L2, having received 8 to 10 years of formal English instruction. Their English proficiency was measured using the College English Test Band Four (CET-4) paper, with an average score of 50.3 out of a full score of 95. The participants began learning Korean upon university admission and were in their second semester of Korean coursework at the time of data collection, thus classified as low-proficiency L3 learners.

In addition, fourteen native Korean university students were recruited as a control group. Their Korean writing samples served as a benchmark to judge the naturalness and appropriateness of target-language expressions produced by the trilingual participants.

Strict recruitment and screening criteria were implemented to ensure homogeneous participant backgrounds. Eligibility requirements were set as follows: (1) Mandarin Chinese as the sole native language, with no prior exposure to Korean or other foreign languages before university admission; (2) English as the second language, with 8–10 years of formal classroom English instruction and CET-4 scores adopted as the unified measurement of L2 English proficiency; (3) absolute beginners of Korean who started L3 learning in their first university semester and remained at a low proficiency level in the second semester when data collection was conducted; (4) willingness to complete three parallel compositions in Korean, English and Chinese and fully cooperate with verbal think-aloud procedures. All first-year Korean majors in the target university were invited to participate voluntarily. Participants who failed to finish all experimental tasks, produced illegible think-aloud recordings, or submitted compositions with insufficient word counts were excluded from the final sample, resulting in nine valid trilingual learners for formal analysis.

3.3. Data Collection

Data collection was implemented at the end of the second semester via think-aloud composition tasks. Guided by six picture strips adapted from the comic collection *Father and Son* arranged in chronological story sequence (familiar to student participants and free of comprehension barriers), each participant completed a 200-character composition three times, first in Korean, then in English, and finally in Mandarin Chinese, while verbalizing all concurrent thought processes aloud without language restrictions. Prior to formal data elicitation, standardized think-aloud training was administered to familiarize all participants with the experimental procedure.

Upon completion of data collection, parallel composition corpora in Korean, English and Chinese for each participant were obtained, alongside full audio recordings of think-aloud verbalizations. All audio recordings were transcribed verbatim for subsequent analytical coding.

3.4. Corpus Coding and Analysis

Corpus annotation was completed collaboratively by two Korean language instructors with advanced English proficiency. Dual independent coding was implemented to ensure annotation rigor: both coders analyzed the full dataset separately before cross-checking against each participant’s Chinese and English compositions as well as native Korean control writing samples. Inter-coder reliability was quantified via Cohen’s Kappa coefficients. The Kappa value for word-class segmentation and error tagging reached 0.87, and the coefficient for judging L1/L2 transfer sources was 0.83, yielding an overall coding agreement rate of 94.2%. Any inconsistent coding cases were resolved through joint discussion, cross-referencing trilingual written drafts and verbatim think-aloud transcripts to reach a unified judgment. All coding operations followed a four-stage procedure detailed below:

Word class segmentation. All lexical items were categorized into two macro-classes in line with the research objectives: content words and function words. Content words encompass four subcategories: nouns, verbs, adjectives and adverbs. Function words cover all remaining lexical items, subdivided into particles, auxiliary verbs, and miscellaneous function words.

Accuracy marking for each word class. For content word subcategories, distinct tags were assigned to distinguish total tokens, correct usages and erroneous usages: nouns [CN], [CNY], [CNE]; verbs [CV], [CVY], [CVE]. Due to limited token counts, adjectives and adverbs were merged into a single group marked [CA] (total), [CAY] (correct), and [CAE] (erroneous). For function words, tagging rules are as follows: particles [FD], [FDY], [FDE]; auxiliary verbs [FM], [FMY], [FME]; miscellaneous function words [FO], [FOY], [FOE].

Consistency judgment between erroneous Korean lexemes and equivalent Chinese/English expressions. This study exclusively investigates negative transfer; therefore, only erroneous tokens in Korean narrative production were examined. The degree of alignment between erroneous Korean lexical patterns and corresponding Chinese and English constructions was assessed based on formal and semantic similarity, with raw frequency tallies recorded for each condition. Coding labels for Chinese alignment: ECHA (error consistent with Chinese), ECHI (error inconsistent with Chinese), ECHU (undeterminable Chinese source). Coding labels for English alignment: EENA (error consistent with English), EENI (error inconsistent with English), EENU (undeterminable English source).

Transfer source identification. Drawing on the alignment results from Stage 3, participants' L1/L2 written texts, and think-aloud protocols generated during Korean production, transfer origins were identified in accordance with the Comparative-Inductive Framework for Transfer Analysis in Multilingual Production (Cai, 2022). Transfer was attributed to L1 Chinese or L2 English where formal and/or semantic overlap was detected, and raw frequencies and proportional ratios of each transfer source were tabulated.

Following full corpus annotation, a synchronic analysis was carried out adhering to three individual-level procedures and the first two group-level procedures outlined in Cai's (2022) comparative-inductive framework: (1) The corpus tool AntConc 3.2.4w was used to extract total token counts and error frequencies of all content and function word subcategories in the Korean corpus, from which error rates were computed. (2) All instances of L1 transfer and L2 transfer in each participant's compositions were manually identified, and corresponding transfer proportions were calculated per individual. (3) The corpus software retrieved all pooled instances of L1 and L2 transfer across all participants for each lexical category, and aggregate transfer proportions were calculated. (4) Chi-square tests were run in SPSS to examine whether statistically significant differences existed across error proportions among word classes, transfer proportions within each lexical category, and individual transfer ratios across participants. SPSS automatically rounded all decimal proportions to integer values prior to statistical computation.

Many lexical subcategories contained empty zero-frequency cells: most learners showed no L2 noun/verb transfer, and almost no transfer in adjectives and adverbs. This skewed distribution violated the chi-square assumption that all cell expected values exceed 5. To mitigate analytical bias, chi-square tests were only conducted on L1 transfer proportions of nouns and verbs, which possessed sufficient non-zero observations. Alternative statistical approaches including Fisher's exact test and likelihood ratio test were considered during preliminary analysis. However, chi-square statistics were retained for interpretable subsets of data because this study prioritized straightforward group proportional comparisons. Lexical categories with severe zero-cell bias were only reported with descriptive frequency percentages without inferential significance testing.

When reporting chi-square test results, Cramer's *V* was calculated as the corresponding effect size to quantify the magnitude of group differences. According to conventional criteria, Cramer's *V* values of 0.1, 0.3 and 0.5 correspond to small, medium and large effect sizes respectively.

4. Results and Discussion

4.1. Token Counts and Accuracy of Content Words and Function Words in Korean Compositions

Table 1 presents the raw frequencies and error rates of various content and function word categories produced by the nine participants. Overall, error rates varied substantially across content word subcategories: nouns registered an error rate of 11.3%, verbs 36.8%, and adjectives/adverbs 15.8%. A Chi-square test yielded statistically significant differences among the three categories ($\chi^2 = 17.844$, $p = .000$, Cramer's *V* = 0.28, indicating a medium effect size). By contrast, function word subcategories showed mild discrepancies in error rates: auxiliary verbs (17.5%), particles (13.7%), and miscellaneous function words (18.9%). The Chi-square test indicated no significant inter-group differences for function words ($\chi^2 = 0.824$, $p = .662$, Cramer's *V* = 0.04, indicating a trivial effect size).

Error rates varied widely across all word classes between learners. SK1 and SK5 had no noun errors, yet SK6 reached a 39.5% noun error rate; auxiliary verb errors ranged from only 4.0% (SK8) up to 29.4% (SK6). This finding suggests that despite receiving identical Korean language input, learners progress at uneven paces in L3 Korean acquisition. From the perspective of Dynamic Systems Theory, such individual disparities may stem from the interaction of multiple subsystems, including proficiency in background languages, learning motivation, language aptitude, and learning engagement.

Table 1. Error Rates (%) and Raw Frequencies of Content and Function Word Categories in Korean Compositions

Participants	Content Words			Function Words		
	Nouns	Verbs	Adjectives /Adverbs	Auxiliary Verbs	Particles	Miscellaneous Function Words
SK0	6.5(3/46)	33.3(9/27)	0(0/5)	25.5(12/47)	10.6(5/47)	0(0/7)
SK1	0(0/51)	10.0(3/30)	0(0/8)	9.6(5/52)	13.6(8/59)	23.3(10/43)
SK2	17.5(7/40)	47.6(10/21)	0(0/3)	25.0(7/28)	12.5(5/40)	44.4(4/9)
SK3	9.4(5/53)	51.9(14/27)	100(1/1)	21.1(8/38)	12.5(7/56)	16.7(1/6)
SK4	10.6(5/47)	33.3(9/27)	13.3(2/15)	7.9(3/38)	8.3(5/60)	6.5(3/46)
SK5	0(0/43)	44.0(11/25)	0(0/7)	20.0(6/30)	3.8(2/52)	14.3(4/28)
SK6	39.5(15/38)	44.4(8/18)	28.6(2/7)	29.4(10/34)	29.3(12/41)	45.5(5/11)
SK7	18.5(5/27)	60.0(6/10)	50.0(4/8)	13.1(3/23)	22.2(6/27)	22.2(2/9)
SK8	7.1(2/28)	26.3(5/19)	0(0/3)	4.0(1/25)	20.0(7/35)	50.0(8/16)
Total	11.3(42/373)	36.8(75/204)	15.8(9/57)	17.5(55/315)	13.7(57/417)	18.9(33/175)

Note: Values inside parentheses denote (error tokens / total tokens) of each lexical category. Content words include nouns, verbs, adjectives and adverbs; function words consist of auxiliary verbs, particles and miscellaneous function words.

All percentages are retained to one decimal place.

(1) Noun error: 이 지팡이를 쓰는 게 더 좋아요? (SK4)

In this sentence, Participant SK4 failed to use the native Korean term “목지팡이” for “walking stick”. Instead, the participant mechanically adopted the semantic collocation of the Chinese lexicon and rigidly applied a Sino-Korean word, which constitutes L1 transfer.

(2) Verb error: 이 아이가 사과를 보았어요. (SK6)

The matching sentence in the participant’s Chinese composition reads “He spotted an apple tree”. The verb “발견하다” should be used to describe accidentally catching sight of the fruit tree. However, Participant SK6 confused the perception verb “보다” (to see) with “발견하다” (to discover accidentally) and incorrectly employed “보다”.

(3) Adverb error: 이 방법은 실패했어요. 할아버지 머리에 아직 지팡이가 맞았어요. (SK3)

The corresponding sentence in the participant’s Chinese composition is “The old man was hit on the head by the small walking stick”. Cross-referencing writing samples from native Korean speakers reveals that the adverb “아직” is unnecessary in this context. Influenced by the first language, Participant SK3 redundantly inserted the adverb “아직”.

(4) Auxiliary verb error: 그들은 사과를 따고 싶다고 생각해요. (SK0)

The matching sentence in the participant’s Chinese composition is “They wanted to pick the apples”. The participant ought to have used “따려고 하다” to convey volition. Nevertheless, SK0 falsely assumed that the Korean construction “~다고 생각하다” directly corresponds to the Chinese expression “want to”, and thus only used the base verb “따다”.

(5) Particle error: 그의 키는 낮아요. (SK7)

No matching sentence for this Korean utterance appears in Participant SK7’s Chinese composition. However, the participant’s think-aloud recordings taken during Korean writing contain the equivalent Chinese idea “But he is short in stature”. The Chinese possessive marker “de” can signal a possessive relationship between a whole and its attribute. Accordingly, SK7 mistakenly believed that the Korean possessive particle “의” could be used in direct parallel with Chinese possessive logic to modify the abstract noun “키” (height).

(6) Miscellaneous function word error: 하지만 저 단단한 사과는, 두 사람이 떠난 뒤 떨어졌어요. (SK1)

The corresponding sentence in the participant’s Chinese composition is “But the apple fell right after the two people left”. No equivalent demonstrative determiner exists in the matching Chinese sentence, and native Korean writing corpora confirm that the demonstrative modifier “저” is redundant at this position.

4.2. Individual Variability of Transfer in Korean Content Word and Function Word Production among Trilingual Learners

To illustrate instances of L1 and L2 transfer across all subcategories of content and function words produced by the nine participants, we tallied the raw counts of L1 and L2 transfer tokens for each lexical category per participant against the total token count of that category. These figures were then used to calculate the percentage of L1 and L2 transfer within each lexical category for every individual participant (see Table 2 and Table 3). Among the participants, SK1, SK4 and SK5 attained the highest Korean proficiency; SK0, SK2 and SK8 fell into the intermediate proficiency bracket; SK3, SK6 and SK7 were classified as low-proficiency learners.

Table 2. Frequencies and Transfer Ratios (%) of Transfer Occurrences in Content Word Subcategories across the Nine Participants

Participants	Nouns		Verbs		Adjectives/Adverbs	
	L1 Transfer	L2 Transfer	L1 Transfer	L2 Transfer	L1 Transfer	L2 Transfer
SK1	0 (0/51)	0 (0/51)	10.0 (3/30)	0 (0/30)	0 (0/8)	0 (0/8)
SK4	10.6 (5/47)	0 (0/47)	11.1 (3/27)	0 (0/27)	13.3 (2/15)	0 (0/15)
SK5	0 (0/43)	0 (0/43)	8.0 (2/25)	0 (0/25)	0 (0/7)	0 (0/7)
SK0	2.2 (1/46)	0 (0/46)	22.2 (6/27)	0 (0/27)	0 (0/5)	0 (0/5)
SK2	15.0 (6/40)	0 (0/40)	23.8 (5/21)	9.5 (2/21)	0 (0/3)	0 (0/3)
SK8	3.6 (1/28)	0 (0/28)	5.3 (1/19)	5.3 (1/19)	0 (0/3)	0 (0/3)
SK3	5.7 (3/53)	1.9 (1/53)	40.7 (11/27)	11.1 (3/27)	100 (1/1)	0 (0/1)
SK6	47.4 (15/38)	0 (0/38)	22.2 (4/18)	5.6 (1/18)	0 (0/7)	0 (0/7)

Note: Table 2 Transfer frequencies and ratios of content word subcategories among nine trilingual participants. L1 Transfer = cross-linguistic negative transfer originating from Chinese; L2 Transfer = cross-linguistic negative transfer originating from English. All percentages are rounded to one decimal place.

As illustrated in Table 2: (1) For all content word categories produced by each participant, the percentage of L1 transfer exceeded that of L2 transfer. The sole exception was Participant SK8, whose L1 and L2 transfer proportions for verbs were identical at 5.3%. (2) A cross-participant comparison of L1 transfer across the three content word subcategories revealed that every learner produced verb-related L1 transfer. Two participants exhibited zero noun L1 transfer, while six participants showed no L1 transfer in adjectives and adverbs. (3) L2 transfer proportions remained universally low across all participants for the three content word types, with numerous learners registering no L2 transfer instances at all. Relatively high L2 transfer ratios were exclusively observed within verb usage (9.5% for SK2 and 11.1% for SK3).

Chi-square significance tests were conducted to verify whether the observed between-participant variability in transfer percentages reached statistical significance. However, substantial numbers of participants demonstrated zero L2 transfer for nouns and verbs, alongside complete absence of both L1 and L2 transfer for adjectives and adverbs. These skewed frequency distributions violated test assumptions, restricting chi-square analysis solely to L1 transfer percentages of nouns and verbs. The test results indicated statistically significant inter-participant differences in L1 transfer proportions for both nouns ($\chi^2 = 103.208$, $p = .000$, Cramer's $V = 0.52$, indicating a large effect size) and verbs ($\chi^2 = 57.723$, $p = .000$, Cramer's $V = 0.43$, indicating a large effect size).

Marked individual variability existed in both L1 and L2 verb transfer across the three content word groups. For instance, Participant SK3 produced three instances of verb L1 transfer with no L2 transfer occurrences, as demonstrated in Example (7):

(7) 그러고 아버지가 사과나무에 올라가서 지팡이로 닿았어요. (SK4)

Cross-referencing native Korean speaker corpora confirms the verb *치다* is contextually appropriate here. No matching Chinese sentence was found, but SK4's think-aloud records show they equated “닿다” directly with the Chinese verb “touch”. The mismatch between the actual meaning of “닿다” and the sentence context constitutes L1 transfer.

Participant SK0 produced six verb L1 transfer tokens without any L2 transfer. Beyond semantic misalignment identical to SK4's error pattern (Example (8)), SK0 also exhibited transfer-induced mistakes in lexical collocation, potential mood marking, and the distinction between activity and resultative verbs (Example (9)).

(8) 그들은 많은 방법을 생각했어요. (SK0)

The corresponding Chinese sentence reads “They thought of many solutions”. Side-by-side comparison of SK0's Korean and Chinese compositions shows the learner rigidly mapped the Korean verb “생각하다” onto the Chinese verb phrase “thought of”, resulting in erroneous verb selection; the semantically correct lexical item is “생각해내다”. The improper use of “생각하다” thus constitutes L1 transfer driven by interference from Chinese verbal semantics.

(9) 사과를 따려고 생각했어요. 사과를 따지 못했어요. (SK0)

The matching Chinese sentence translates to “They failed to pluck the apples”. The potential mood construction “떨 수 있다” derived from the base verb “따다” is grammatically required in this context. Since Chinese verbs carry no inflectional marking for potential mood, SK0 failed to deploy the corresponding Korean morphological structure, marking this instance as L1 transfer.

Participant SK3 generated 11 verb L1 transfer instances and 3 verb L2 transfer instances, recording the highest volume of L1 transfer among all nine participants. Close textual analysis revealed six of these 11 errors stemmed from learner-created Sino-Korean compound verbs, including “흔들다, 던지다, 버리다, 오르다, 떨어뜨리다, 따다”, representing a consistent error pattern, as exemplified below:

(10) 아버지가 사과나무를 흔들어서 사과를 흔떨으려고 했어요. (SK3)

The corresponding Chinese sentence states “Father shook the apple tree violently, hoping to shake the apples off”. Standard Korean lexical items such as “흔들다” and “흔들어떨어뜨리다” are required here. Unable to retrieve the fixed Korean verb meaning “shake off”, SK3 directly combined Korean verb endings based on the Chinese semantic collocation “shake + drop”, leading to L1 transfer.

Beyond self-constructed compound verbs, additional L1 transfer errors emerged, such as in the utterance “아이와 아버지가 여러 번 실패한 뒤 사과를 딸 수 없다는 걸 확정하려 했어요.” (SK3), where “확인하다” is the semantically accurate verb. The matching Chinese sentence reads “After repeated failed attempts, they realized they could not obtain the stubborn apple”. Influenced by Chinese lexical semantics, SK3 equated the Chinese verb “confirm” with Korean “확인하다”, triggering L1 transfer.

L2 transfer errors primarily manifested as misspellings of loanwords. For example, in the sentence “그리고 아버지가 점프해서 신발로 사과를 쳤어요”, the standard orthography “점프” derives from the English lexical item jump. The participant’s misspelling arose from interference of English pronunciation and orthographic rules, which counts as L2 transfer.

The substantial individual divergence in transfer frequency can be partially interpreted by learners’ varying L2 English proficiency measured by CET-4 scores. Participants with higher English test scores (SK1, SK4, SK5) exhibited far fewer L1 and L2 transfer errors across both content and function words. Their stronger command of English may help them establish clearer boundaries between three linguistic systems and suppress inappropriate cross-linguistic mapping. In contrast, low-English-proficiency learners (SK3, SK6, SK7) relied heavily on Chinese lexical semantics and collocations when constructing Korean expressions, leading to more frequent L1 negative transfer. Such disparity implies that L2 language competence serves as an important moderator of cross-linguistic interference during early L3 Korean production.

Transfer occurrences in function word production across the nine participants are summarised in Table 3. The table yields three key observations: (1) L1 transfer appeared far more frequently than L2 transfer across all three function word subcategories, evidenced by the large number of participants recording zero L2 transfer instances. (2) Pronounced individual variability characterised L1 transfer across all function word types; some learners showed no L1 transfer at all, while others attained L1 transfer ratios exceeding 18.0%. (3) Miscellaneous function words demonstrated higher L2 transfer proportions than auxiliary verbs and particles, a pattern potentially explained by the heterogeneous lexical composition of the miscellaneous category. Overall, most participants produced no L2 transfer in function word use, a trend particularly prominent within auxiliary verbs.

Table 3. Transfer Rates (%) and Raw Frequencies of Different Categories of Function Words Produced by Nine Participants

Participants	Auxiliary Verbs		Particles		Miscellaneous Function Words	
	L1 Transfer	L2 Transfer	L1 Transfer	L2 Transfer	L1 Transfer	L2 Transfer
SK1	1.9 (1/52)	0 (0/52)	3.4 (2/59)	3.4 (2/59)	18.6 (8/43)	2.3 (1/43)
SK4	2.6 (1/38)	0 (0/38)	1.7 (1/60)	0 (0/60)	4.3 (2/46)	0 (0/46)
SK5	6.7 (2/30)	0 (0/30)	3.8 (2/52)	0 (0/52)	3.6 (1/28)	0 (0/28)
SK0	19.1 (9/47)	0 (0/47)	6.4 (3/47)	0 (0/47)	0 (0/7)	0 (0/7)
SK2	3.6 (1/28)	0 (0/28)	5.0 (2/40)	0 (0/40)	11.1 (1/9)	11.1 (1/9)
SK8	0 (0/25)	0 (0/25)	5.7 (2/35)	0 (0/35)	6.3 (1/16)	0 (0/16)
SK3	5.2 (2/38)	0 (0/38)	3.6 (2/56)	1.8 (1/56)	16.7 (1/6)	16.7 (1/6)
SK6	8.9 (3/34)	2.9 (1/34)	2.4 (1/41)	0 (0/41)	9.1 (1/11)	18.2 (2/11)

Note: Table 3 Transfer rates and raw frequencies of different categories of function words produced by nine participants.

L1 Transfer = negative cross-linguistic transfer induced by L1 Chinese; L2 Transfer = negative cross-linguistic transfer induced by L2 English.

All percentages are rounded to one decimal place.

Given that numerous participants exhibited zero L2 transfer across all function word subcategories, Chi-square tests were only conducted to examine inter-participant disparities in L1 transfer ratios. The test results revealed statistically significant differences in L1 transfer proportions among the nine participants for auxiliary verbs ($\chi^2 = 31.679$, $p = .000$, Cramer's $V = 0.35$, indicating a medium effect size), particles ($\chi^2 = 51.000$, $p = .000$, Cramer's $V = 0.41$, indicating a large effect size), and miscellaneous function words ($\chi^2 = 22.000$, $p = .001$, Cramer's $V = 0.31$, indicating a medium effect size). Among the three function word categories, particles displayed the most prominent individual variability in transfer patterns, which will be illustrated via representative examples below.

Participant SK1 produced two instances of particle-related L1 transfer, as shown in Example (11):

(11)그 위 사과 하나 있어요.(SK1)

The matching Chinese sentence reads “There is only one apple up there”. The grammatically accurate Korean version requires the locative particle “에” after “그 위” and the nominative particle “가” after “사과”. As an agglutinative language, Korean relies heavily on particles to link syntactic constituents, whereas Chinese has no such grammatical requirement. Influenced by L1 transfer, Participant SK1 omitted the obligatory particles. The omission of the nominative marker “가” also stems from L2 English interference: English lacks dedicated agglutinative particles to flag sentence subjects, so this error arises from concurrent L1 Chinese and L2 English transfer.

Participant SK0 generated three particle L1 transfer instances with no L2 transfer, illustrated in Example (12):

(12)하지만 잠시 뒤 사과도 떨어지지 않았어요.(SK0)

The corresponding Chinese sentence translates to “Yet after shaking it for a long time, the apple still would not fall off”, where the contrast particle “는” is grammatically appropriate. The particle “도” inherently implies the existence of another comparable entity. Participant SK1 mechanically equated the Chinese adverb “also” directly to the Korean particle “도”, constituting a typical case of L1 transfer.

Participant SK7 recorded six particle L1 transfer cases and four L2 transfer cases. Its L1 transfer errors cover particle omission, semantic mismatches and formal misuse, while L2 transfer originates from interference of English phrasal structures. Representative examples are provided as follows:

(13)그의 키는 낮아요.(SK7)

No matching utterance for this Korean sentence appears in SK7's Chinese composition, yet the participant's retrospective think-aloud protocols for Korean writing contain the equivalent Chinese meaning “But he is short in stature”. The Chinese possessive marker “de(的)” can signal attributive possession between a whole and its attribute. Participant SK7 falsely assumed that the Korean possessive particle 의 could be unrestrictedly applied following Chinese possessive logic to modify abstract nouns, resulting in L1 transfer.

(14)그리고 사과를 던졌어요. (SK7)

This utterance manifests L2 English transfer. The standard Korean expression should be “사과를 향해 신발을 던졌어요”, which requires the directional particle 에/향해. The participant intended to convey “He threw his shoe toward the apple” but incorrectly wrote that the apple was thrown away. The participant's original English thought utterance was “*And his father took off the shoes and threw the apple*”. By literally translating the English verb-object construction and omitting the mandatory Korean directional case marker, the learner's production demonstrates transfer interference from English verb-object syntax.

4.3. Disparities in the Quantity and Source of Transfer between Content Words and Function Words in Korean Compositions

Table 4 summarizes L1 and L2 transfer patterns of content words and function words in written production by Chinese–English–Korean trilingual learners. Four key findings emerge from the data:

First, the overall transfer percentage of content words (47.6%) is markedly higher than that of function words (27.4%). Second, L1 transfer accounts for a larger proportion than L2 transfer across all lexical categories, indicating that Chinese exerts stronger interfering effects than English on beginner-level Korean learners. Third, among the three subcategories of content words, transfer frequency ranks as follows: verbs (22.8%) > adjectives/adverbs (14.0%) > nouns (10.8%). A Chi-square test reveals a marginally significant difference across the three categories ($\chi^2 = 4.875$, $p = .087$, Cramer's $V = 0.11$, indicating a small effect size). Fourth, for the three function word subcategories, transfer proportions follow the order: miscellaneous function words (13.1%) > particles (8.2%) > auxiliary verbs (6.1%). Nevertheless, the Chi-square test detects no statistically significant differences among the three groups ($\chi^2 = 2.889$, $p = .236$, Cramer's $V = 0.09$, indicating a small effect size).

Table 4. L1 and L2 Transfer Rates (%) and Raw Frequencies among Trilingual Learners

Broad Lexical Category	Subcategory	L1 Transfer	L2 Transfer	Overall Transfer Proportion
Content Words	Nouns	10.6 (37/373)	0.2 (1/373)	10.8 (38/373)
Content Words	Verbs	19.3 (38/204)	3.5 (7/204)	22.8 (45/204)
Content Words	Adjectives / Adverbs	14.0 (8/57)	0.0 (0/57)	14.0 (8/57)
Function Words	Auxiliary Verbs	5.8 (20/315)	0.3 (1/315)	6.1 (21/315)
Function Words	Particles	6.0 (21/417)	2.2 (7/417)	8.2 (28/417)
Function Words	Miscellaneous Function Words	7.7 (15/175)	5.4 (5/175)	13.1 (20/175)

Our second finding diverges from the outcomes of several prior studies. A large body of research on L3 production has reported that the L2 tends to exert stronger activation effects than the L1 (Dewaele, 1998; De Angelis & Selinker, 2001; Schepens et al., 2016), which lends empirical support to the L2 Status Model and the Developmental Model of Trilingual Production proposed by Williams and Hammarberg (1998). Nevertheless, De Bot (2004: 7) argued that L1 interference in L3 production can far outweigh L2 interference. Two potential explanations were put forward: either the L1 bears shorter linguistic distance to the L3, or learners possess higher proficiency in their L1 relative to their L2. Both rationales apply to the present sample of beginner Korean learners. On one hand, Chinese (the L1) shares greater typological proximity with Korean than English (the L2); on the other hand, participants demonstrate markedly higher proficiency in their native Chinese than in English as their second language.

5. Conclusion

This study recruited nine low-proficiency Chinese–English–Korean trilingual beginners. Based on topic-matched trilingual writing corpora, native Korean reference texts and think-aloud data, and using Cai's (2022) comparative-inductive framework, this paper maps transfer error patterns in Korean content and function words. It further quantifies the frequency, source discrepancies and individual variability of negative lexical transfer triggered by L1 Chinese and L2 English, providing first-hand empirical evidence for research on lexical transfer within the Chinese–English–Korean trilingual constellation.

The research findings revise the unidirectional deductions derived from the L2 Status Model and the Developmental Model of Trilingual Production. Empirical evidence confirms that under acquisition conditions where the L1 bears close linguistic distance to the L3 and learners attain substantially higher L1 proficiency relative to the L2, the L1 acts as the dominant source of lexical transfer in L3 production, while L2 transfer only constitutes secondary and sporadic interference. In addition, lexical transfer exhibits distinct hierarchical patterns across word classes. Content words, particularly verbs, are more susceptible to L1 transfer at the cross-linguistic semantic and collocational levels. The overall incidence of transfer among function words remains lower, with no statistically significant disparities in transfer intensity across internal function-word subcategories. Significant individual heterogeneity in transfer frequency is observed among trilingual learners, stemming from gaps in Korean proficiency and linguistic cognitive competence, which mirrors the developmental traits of dynamic interaction among multiple subsystems within the third language acquisition system.

Several limitations of this research deserve acknowledgement. First, this study adopts a small-scale synchronic case-study design with merely nine low-proficiency Korean beginner participants, all native Chinese speakers who hold intermediate English proficiency and have no prior Korean learning experience before college enrollment. Such a narrow sample inevitably restricts the generalizability of the present exploratory findings; the L1-dominant lexical transfer pattern identified in this paper can only be extended to Chinese–English–Korean trilingual beginners with equivalent linguistic backgrounds, and we cannot track longitudinal dynamic changes in L3 lexical transfer as Korean proficiency improves. Second, the analysis solely targets negative transfer in written production, excluding oral corpora and overlooking positive transfer effects.

Future research can be expanded along three avenues. To begin with, scholars may enlarge participant pools, recruit learners with varied English proficiency, and launch cross-semester longitudinal tracking to dynamically capture the fluctuating intensity of L1 and L2 transfer across beginner, intermediate and advanced Korean learning stages, so as to further verify the exploratory conclusions of this research. Second, trilingual constellations with great typological distance between L1 and L3 (e.g., Chinese–English–French) can be adopted to test the boundary conditions of the L2 Status Model and the Developmental Model of Trilingual Production. Third, multi-dimensional evidence including oral production recordings and cognitive lexical processing experiments

can be incorporated to explore both positive and negative cross-linguistic transfer, which will enrich the applicable scope and analytical dimensions of the comparative-inductive framework for multilingual production analysis.

The pedagogical strategies outlined above mainly target beginner Korean learners. As learners advance to intermediate and upper-intermediate proficiency, the weight of L1-induced negative transfer from Sino-Korean vocabulary gradually diminishes. Accordingly, instructors may adjust teaching priorities: less class time needs to be spent on contrasting Chinese–Korean semantic mismatches, while more emphasis should be placed on mastering native Korean content word collocations, complex particle combinations and authentic discourse conventions that show weaker orthographic overlap with Chinese. This staged teaching design can provide explicit curriculum references for Korean language course developers at tertiary institutions.

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