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Noisy Representations in Korean and Chinese EFL Learners' Interpretation of English Caused-Motion Constructions: The Role of L1 Typology

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ABSTRACT

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This study examines how Korean and Chinese EFL (English as a Foreign Language) learners interpret English caused-motion constructions, focusing on the influence of L1 typology and limited L2 exposure within a usage-based framework. Although typological differences between L1 and L2 introduce significant conceptual and linguistic challenges, prior research has often overlooked such typological effects. Addressing this gap, the study investigates how Korean and Chinese EFL learners interpret English caused-motion constructions with manner-denoting intransitive verbs, using the acceptability judgment test (AJT) and the paraphrasing test. Findings indicate that, consistent with prior research, both groups of participants tended to accept ungrammatical formulations, highlighting the inconsistency and instability of their L2 grammatical representations, often referred to as noisy L2 representations. Notably, Korean learners, influenced by their verb-framed L1 typology, favored bi-clausal structures and showed stronger resistance to English mono-clausal caused-motion constructions. These findings underscore the role of L1 typology in shaping L2 interpretation, contributing to greater representational variability among Korean EFL learners.

KEYWORDS

construction grammar, noisy representation, language typology, caused-motion construction, EFL, Korean, Chinese

1. Introduction

Achieving native-like proficiency in a second language (L2) is a significant challenge, as learners often produce errors that are rare among native speakers (Flege et al. 1999). A common challenge found in L2 acquisition is overgeneralization, whereby learners apply verb-argument structures in ways that deviate from target-language norms. For example, L2 English learners may produce erroneous sentences like "?Amber explained Zach the answer,[1]" using a ditransitive construction instead of the more conventional prepositional dative, as in "Amber explained the answer to Zach" (Bley-Vroman and Joo 2001, Inagaki 1997, 2001).

For native speakers, on the other hand, constructional preferences are reinforced through frequent exposure to conventional verb-argument pairings, a process known as conservatism via entrenchment. This frequency-sensitive process strengthens preferences for conventional structures and preempts unconventional ones, thereby supporting native speakers' adherence to standard usage (Ambridge et al. 2008, Brooks and Tomasello 1999). For example, native speakers typically favor familiar phrases, such as "He swam to the shore." This reflects frequency-based conventionalization patterns with established norms (Robenalt and Goldberg 2015).

While entrenchment promotes stability in language use, it does not fully explain how native speakers avoid overgeneralization while generating creative constructions. Statistical preemption complements entrenchment by enabling speakers to form constructional constraints through indirect negative evidence (Goldberg 2011, Perek and Goldberg 2017). When presented with an unconventional form alongside a more conventional competing alternative, speakers are less likely to accept the unconventional form as acceptable. For instance, when encountering "?The magician disappeared the rabbit," native speakers generally prefer "The magician made the rabbit disappear" as a competing alternative (hasCA) formulation. In cases without a competing alternative (noCA), such as "The lifeguard swam the children to the shore," novel formulations are more likely to be accepted as creative extensions (Boyd and Goldberg 2011, Robenalt and Goldberg 2015, 2016). This inferential mechanism contributes to the refinement of native speakers' linguistic intuitions, reducing overgeneralization while preserving flexibility in language use.

Crucially, research in Construction Grammar emphasizes that verbs do not combine with constructions arbitrarily but do so based on probabilistic patterns learned through experience (Bybee 2010, Goldberg 1995, 2006, Tomasello 2003). Argument structure constructions function as form–meaning pairings, and L1 speakers flexibly integrate verbs with constructions even when verbs lack certain argument roles or have underspecified semantics (Ambridge et al. 2008, Kako 2006). This flexibility is nevertheless constrained by statistical regularities—specifically, the frequency with which a verb co-occurs with a construction (Ambridge et al. 2014, Boyd and Goldberg 2011, Ellis 2002, Robenalt and Goldberg 2015). As formalized in statistical preemption (Goldberg 1995, 2019), native speakers reject unattested combinations such as Mike explained me the story because a more conventional alternative (e.g., "Mike explained the story to me") repeatedly preempts it as indirect negative evidence. Conversely, in the absence of such conventional competition, speakers readily accept innovative uses (e.g., "Mike busted me some fries").

In L2 acquisition, limited exposure to the target language and continuous influence from the learners' L1 often hinder the formation of stable constructional knowledge, giving rise to what has been described as noisy representations (Tachihara and Goldberg 2020). Under this view, the linguistic information encoded in L2 learners' mental representations tends to be unstable or only partially specified because their input is restricted or uneven.

[1] The notation "?" denotes awkwardness or ambiguity in the expression.

This representational instability leads learners to experience uncertainty when evaluating the acceptability of unconventional verb–construction pairings. Limited and uneven L2 exposure may weaken the robustness of distributional representations, giving rise to partially specified or unstable constructional knowledge (Grüter et al. 2014, Tachihara and Goldberg 2025). These input-based constraints become even more challenging when combined with L1–L2 typological mismatches, which introduce interpretive difficulty and further disrupt learners' interpretation of L2 constructions (Kim and Rah 2021). Similarly, the noisy channel model (Futrell and Gibson 2017) posits higher noise in L2 learners' memory traces due to diffuse or skewed input and constant L1 activation, leading to uncertainty when evaluating the probabilistic tendencies governing verb–construction combinations.

However, prior research on noisy representations has largely treated the phenomenon as stemming primarily from input limitations, without fully examining how these limitations interact with deeper L1-L2 typological differences (Kim and Hwang 2025, Robenalt and Goldberg 2015, 2016). This gap suggests that noisy representations may not arise solely from input limitations, but from the interaction between restricted input and entrenched L1 typological systems that shape how learners conceptualize and encode event structure. Since L1 typological systems shape how argument structure and motion events are packaged, learners may not simply lack statistical exposure but may also misinterpret available L2 cues through entrenched L1-based representational frameworks. For example, English, as a satellite-framed language, integrates path and manner within a single clause. By contrast, Korean, a verb-framed language, encodes the path in the main verb and typically expresses manner in a separate verb, often requiring a bi-clausal formulation. This structural divergence complicates Korean learners' adaptation to English's compact mono-clausal caused-motion constructions, particularly those containing manner-denoting verbs.

If typological interference constrains the acquisition of English caused-motion constructions, it may also impede a broader mastery of English argument structures, which are interconnected within English syntax. For example, Sung (2018) provides empirical evidence that English verb–particle constructions are systematically linked to major argument-structure constructions such as caused-motion and transitive resultatives within a shared constructional network (Goldberg 1995, 2015), rather than being isolated lexical patterns. Building on this network-based view, Kim and Rah (2021) demonstrate that instruction explicitly organized around such constructional networks leads to significantly greater learning gains than approaches focusing on individual particles or verbs. Crucially, their findings suggest that caused-motion functions as a central and highly productive construction within this network, given its close structural and semantic connections to other high-frequency patterns. Understanding the impact of L1-L2 typological variation on the acquisition of caused-motion construction is particularly crucial when the relevant construction involves manner-denoting verbs, which add complexity for Korean EFL learners. Yet no prior work has directly investigated whether distinct patterns of noisy representation emerge depending on the degree of typological similarity between learners' L1 and English.

Therefore, this study aims to address this gap by examining how Korean (i.e., verb-framed language) and Chinese (i.e., a language exhibiting mixed typological properties with partial overlap with satellite-framed patterns) differ in their interpretation of English caused-motion constructions (Slobin 2004, Talmy 1985). Korean learners, whose L1 favors bi-clausal strategies for manner and path, may resist English's mono-clausal formulation of caused-motion construction, whereas Chinese learners, whose L1 shares certain structural properties with English while differing in others, may accept such formulations, since their translation-equivalent L1 construction does not restrict mono-clausal integration of manner and path as strongly as Korean does (Croft et al. 2010, Slobin 1996a, 1996b, 2004). In particular, Mandarin Chinese encodes path and manner through serial verb constructions and resultative compounds, allowing both elements to be expressed within a single event description, although not in the same structural configuration as prototypical satellite-framed languages (Croft et al. 2010, Slobin 1996a,

1996b, 2004). By conceptualizing noisy representations as arising from the interaction between (a) limited input that restricts learners' ability to form probabilistic expectations and (b) L1-driven interpretive routines shaped by typological similarities or differences, the present study advances a more comprehensive account of why learners with different L1 backgrounds may diverge in their interpretation of English caused-motion constructions.

2. Literature Review

2.1 Noisy Representation of L2 from Input: Conservatism via Entrenchment and Statistical Preemption

Research in usage-based linguistics demonstrates that native speakers develop strong preferences for high-frequency verbs in familiar constructions, a process referred to as conservatism via entrenchment (Ambridge et al. 2008, Ellis 2002, Ellis et al. 2013). Repeated exposure strengthens conventional verb-construction pairings, rendering them cognitively more accessible and more readily accepted than less familiar alternatives. This frequency-sensitive pattern also extends to L2 learners. For instance, expressions containing high-frequency verbs such as *swam* (e.g., He *swam* to the shore) tend to receive higher acceptability ratings than those containing lower-frequency alternatives such as *backstroked* (Robenalt and Goldberg 2015). Such findings suggest that L2 learners, like native speakers, draw on entrenched distributional patterns when evaluating constructional acceptability (Robenalt and Goldberg 2016).

While entrenchment accounts for learners' preference for familiar constructions, it does not explain how speakers avoid overgeneralization when encountering novel forms. This gap is addressed by statistical preemption (Goldberg 2011), a mechanism whereby speakers infer constraints on a novel verb-construction pairing by repeatedly encountering a more conventional competing alternative (hasCA). When native speakers come across sentences like "The magician disappeared the rabbit", they tend to prefer "The magician made the rabbit disappear" as the more preferred formulation (Boyd and Goldberg 2011, Goldberg 1995, 2006, 2019). Moreover, when a competing alternative (hasCA) is available, native speakers show a stronger tendency to preempt or reject constructions containing high-frequency verbs than those with lower-frequency counterparts. For instance, "disappear" is more readily preempted than its less frequent synonym "vanish" in novel formulations (e.g., "The magician disappeared the rabbit" vs. "The magician vanished the rabbit") (Robenalt and Goldberg 2015, 2016). In the absence of a competing alternative (noCA), however, speakers often accept innovative uses—such as "The lifeguard swam/backstroked the children to the shore"—demonstrating that creative extensions are permissible when the input offers no clear evidence to the contrary.

However, L2 learners often show reduced sensitivity to statistical preemption because their exposure to the target language is both limited and uneven, which frequently results in overgeneralization (Kim and Hwang 2025, Robenalt and Goldberg 2015, 2016). This difficulty gives rise to what Tachihara and Goldberg (2025) describe as 'noisy representations,' wherein learners' constructional knowledge remains unstable or only partially specified. With insufficient input to form reliable constructional representation, L2 learners struggle to establish robust constraints on target-like verb–construction pairings and consequently fail to distinguish between hasCA and noCA contexts—a pattern also observed by Robenalt and Goldberg (2016)[2].

[2] Grüter et al. (2014) proposed restricted ability to generate expectation (RAGE) hypothesis to account for reduced predictive processing in L2 comprehension. We are grateful to the reviewer for drawing attention to the predictive orientation of this framework. While their account emphasizes real-time expectation generation, the present study adopts a representational

2.2 Noisy Representation of L2 from L1 Typological Interference

Noisy representation in L2 acquisition is not only a result of limited L2 exposure but is also significantly influenced by differences between learners' L1 and L2 typology (Ellis and Larsen-Freeman 2006, Montrul 2001, Tachihara and Goldberg 2025). A unique challenge arises when these languages differ typologically, creating what can be considered a 'conceptual warp' in a learner's cognitive and event interpretation (Slobin 1996a, 1996b). Unlike other crosslinguistic differences, typological variation introduces structural and conceptual distinctions that extend beyond syntax and lexicon, shaping how learners perceive and process motion and causation. Slobin's (1996a, 1996b) thinking-for-speaking hypothesis suggests that typological structures in the L1 influence how speakers conceptualize events, embedding L1-specific cognitive schemas that persist in L2 learning. This typological variation affects learners' cognitive frameworks, contributing to relatively stable patterns in perception, categorization, and language use, leading to "the process of construction and *re*construction." (Ellis 2013, p. 366; emphasis original).

Learners whose L1 exhibits satellite-framed properties or shares certain structural overlap with English tend to produce verbs that align more closely with those used by native English speakers, compared to learners whose L1 is verb-framed (Gilquin and Knop 2016, Römer et al. 2014, p. 967). For example, in Korean—a verb-framed language—path is often encoded in the verb, with manner expressed separately or omitted. In contrast, English, as a satellite-framed language, integrates path and manner within a single construction (Ellis 2013, Gilquin and Knop 2016, Römer et al. 2014). This structural difference may contribute to a typologically grounded preference in Korean learners of English, as their L1 framework differs from English's packaging of manner and path, which may make mono-clausal caused-motion constructions less readily accepted (Kang 2017).

Talmy's (1985) typological classification divides languages based on how they encode motion events, particularly with respect to path and manner within a sentence. For instance, in satellite-framed languages like English, path is encoded in a satellite (such as a preposition or particle), while the main verb typically denotes manner. Mandarin Chinese shares certain properties with satellite-framed languages in allowing path and manner to co-occur within a single event description; however, it has also been characterized as exhibiting mixed or equipollent properties, as these elements are frequently expressed through serial verb constructions or resultative compounds rather than through a dedicated satellite element (Slobin 2004, Croft et al. 2010). In contrast, verb-framed languages, such as Korean, Japanese, and Spanish, encode path in the main verb and may express manner in another independent clause. This distinction influences how speakers of each language conceptualize and express caused-motion events (Slobin 1996a, 1996b).

In satellite-framed languages, path and manner are combined within a single clause, as the following English example (1) demonstrates:

(1) The man waltzed her into the room (Folli and Harley 2006).

As (1) shows, "waltzed" encodes manner, while "into the room" specifies path, showing how English can compactly express them in a mono-clausal formulation. Mandarin Chinese employs a partially comparative pattern as shown in (2).

interpretation, focusing on how limited and uneven input may result in partially specified constructional knowledge observable in offline judgment tasks.

(2)

Nǚ	laoban	jiù	bǎ	yī	zhěng	bùhuò	dōu	xiào	chūqù	le.
Female	boss	just	BA	one	all	things	all	smile	out-go	[3]PERF

"The female boss smiled all the goods out" (Shimamura 2008).

In (2), the verb "xiào" ("smiled") combines with "chūqù" ("out-go"), allowing path and manner to be expressed within a single clause, similar to English in terms of event packaging. However, unlike prototypical satellite-framed languages, Mandarin Chinese typically realizes path through directional complements or serial verb constructions ("chūqù"), rather than through an independent satellite element. Therefore, Chinese shares with English the possibility of mono-clausal co-expression of manner and path, while differing in the grammatical units by which these elements are encoded (Fong 2020, Ji et al. 2011, Slobin 2004).

Conversely, in verb-framed languages like Korean, expressing a caused-motion event generally requires two separate clauses to convey both the path and manner components, as exemplified in (3):

(3)

Inmyeonggujowon-i	suyeong-ha-e-seo	
Lifeguard-NOM	swim-VL-Link-CONJ	
aideul-ul	haeanga-ro	om-gy-eot-da.
children-ACC	shore-GOAL	put-CAUS-PAST-DECL[4]

"The lifeguard swam and moved the children to the shore."
(adapted from Talmy 1985, Croft et al. 2010)

In (3), the verb "suyeong-ha-e-seo" ("swam") expresses the manner, while additional verb "om-gy-eot-da" ("moved") denotes the path. Korean's verb-framed structure thus requires a bi-clausal format, in sharp contrast to English's satellite-framed typology, which uses a mono-clausal formulation. These typological differences between English and Korean pose a substantial challenge for Korean English learners, as they must acquire a constructional pattern that integrates manner and path in a way that differs structurally from their L1 (Choi 2018, 2020, Folli and Harley 2006, 2020, Kageyama 2003, Kim 1995, Ko and Sohn 2015, Rappaport Hovav and Levin 1998, 2010, Shibatani and Pardeshi 2002, Son 2007, 2008, Tomasello 1992, Zubizarreta and Oh 2007).

To summarize, Korean differs from English in requiring verb-framed packaging of motion events, whereas Mandarin Chinese occupies an intermediate position: it permits mono-clausal co-expression of path and manner similar to English, yet realizes this integration through structurally distinct mechanisms. Such asymmetries in typological structure may lead to differences in foreign language learners' sensitivity to English caused-motion constructions, with Korean English learners encountering greater structural distance from English mono-clausal integration of manner and path than Chinese English learners (Oh 2010).

[3] PERF: perfective ending

[4] NOM: nominative case marking, VL verbalizer, Link: linking morphology, CON: conjunction, ACC: accusative case marking, GOAL: goal, CAUS: causative morphology, PAST: past tense morphology, DECL: declrative ending.

2.3 Research Questions and Predictions

This study examines how L1 typological background shapes Korean (verb-framed) and Chinese (typologically mixed equipollently-framed) EFL learners' acceptability judgments and structural choices regarding English caused-motion constructions (satellite-framed). The following hypotheses and research questions guide the investigation:

H1 (Frequency-sensitive preference): L2 learners will show frequency-sensitive preferences for verb–construction pairings, favoring high-frequency verbs and conventional formulations over novel ones.
H2 (Reduced sensitivity to competing alternatives): Due to noisy L2 representations and reduced distributional expectations, L2 learners will show weakened sensitivity to constructions with competing alternative formulations.
H3 (L1-L2 typological variation): Sensitivity to construction types will vary across learner groups as a function of L1 background, with Korean EFL learners showing stronger rejection of novel caused-motion constructions and Chinese EFL learners showing relatively greater acceptance.

Based on these predictions, the study addresses the following research questions:

RQ1. Do Korean and Chinese EFL learners display preferences for high-frequency verbs and conventional formulations over novel ones in their acceptability judgments of English sentences?
RQ2. Do Korean and Chinese EFL learners differ in their sensitivity to hasCA and noCA formulations in acceptability judgment tasks?
RQ3. How does L1 typological background influence learners' structural choices and paraphrase strategies for English caused-motion constructions with intransitive verbs?

Although caused-motion constructions constitute the core theoretical focus of the present study, the experimental materials also include baseline and novel formulations that extend beyond canonical caused-motion patterns in order to capture learners' broader constructional judgments.

3. Method

3.1 Participants

A total of 165 Korean EFL learners (EFL_K) and 143 Chinese EFL learners (EFL_C) participated in the study. Table 1 provides a detailed summary of the background information of the EFL_K and EFL_C groups.

The Michigan test was administered to measure the English proficiency of language users (Ko et al. 2009). The result showed that their proficiency range was limited to the novice level (EFL_K = 9.3 / 40, EFL_C = 9.8 / 40). The current study employs the classification criterion suggested in Kim et al. (2019) and sets 22 points out of 40 as a cut-off score for intermediate level language learners. Participants had an average English learning duration of 11.69 years for the EFL_K group and 12.43 years for the EFL_C group.

Table 1. Participants' Background Information

	EFL_K		EFL_C	
	M	*SD*	*M*	*SD*
Age	21.2	2.5	22.3	1.9
English Language Learning Duration	11.69	3.3	12.43	2.3
Proficiency Test	9.3	5.1	9.8	4.9

To examine whether the two learner groups were comparable in overall English proficiency, an independent-samples *t*-test was conducted on the Michigan test scores. Although the mean score of the Chinese group was slightly higher than that of the Korean group, as was mentioned above, the difference did not reach statistical significance ($p > .05$). This indicates that the two groups were broadly comparable in terms of general English proficiency.

Participants were recruited through snowball sampling, beginning with alumni from two high schools in Seoul. These initial participants referred additional eligible respondents by sharing the survey link. Both groups completed the C-test and the Acceptability Judgment Test (AJT) online via Google Forms. Participants' involvement in the study was modestly reimbursed.

The EFL_K group consisted of native Korean speakers, while the EFL_C group included Mandarin-speaking Chinese individuals residing in South Korea for study or work purposes. Participants in the EFL_C group were primarily from mainland Chinese regions where Mandarin is the standard language. This includes Beijing, Hunan, Zhejiang, Fujian, Shandong, Guangdong, Heilongjiang, Hebei, and Jilin.

3.2 Instrument

To address the first and second research questions, an Acceptability Judgment Test (AJT) was used to evaluate sentence acceptability among Korean EFL (EFL_K) and Chinese EFL (EFL_C) learners. The AJT focused on how these learners judged both novel and baseline sentences containing high- and low-frequency verbs, considering the influence of their L1 constructional repertoire. This test was adapted from the framework established by Robenalt and Goldberg (2016) to align with the study's objectives.

The AJT used 28 verb pairs, each consisting of one high-frequency and one low-frequency verb, resulting in 56 target sentences. The criteria for classifying verbs as high- or low-frequency were adopted from previous studies (e.g., Robenalt and Goldberg 2015, 2016). Following their procedure, verb frequency was operationalized using lemma-based counts from the Corpus of Contemporary American English (COCA; Davies 2009). Verbs were first ranked by overall lemma frequency, and verb pairs were then selected such that each high-frequency verb exceeded its low-frequency counterpart by a substantial margin. The mean ratio between high- and low-frequency verbs across the selected pairs was 15.74:1 (Davies 2009).

Robenalt and Goldberg (2015, 2016) designed two types of sentences: 'baseline sentences,' which employed verbs in their conventional constructions, and 'novel sentences,' which featured semantically plausible but atypical constructions.

As (4) demonstrates, baseline sentences included pairs of synonymous verbs, such as "swim" (high frequency) and "backstroke" (low frequency), used in typical intransitive constructions (e.g., "Alex swam/backstroked to the dock"). These sentences served as a standard measure of acceptability.

(4) Baseline sentences for high and low frequency verb pairs
a. Will slept/napped on the sofa.
b. Laurie smiled/grinned.
c. The boys jumped/hopped on the trampoline.
d. The students laughed/chuckled.
e. Alex swam/backstroked to the dock.
f. Taylor sang/crooned a lullaby to the baby.
g. The coach shouted/hollered at the players.
h. The professor explained/recited the assignment.
i. Christina cried/sobbed when her hamster died.
j. The spy forced/coerced the criminal to confess.
k. Brandon fell/tumbled out of the tree.
l. The family considered/contemplated going to Disneyland.
m. Emily found/located the book she needed.
n. Ashley disappeared/vanished into the darkness.

Novel sentences were categorized into two subtypes, hasCA and noCA, based on the presence or absence of a competing alternative (CA) expression, as determined by native speaker judgments. Following Robenalt and Goldberg (2015), a novel formulation was classified as having a competing alternative (hasCA) if more than half of the participants consistently produced a conventional paraphrase by the native English speakers; otherwise, it was classified as having no competing alternative (noCA).

As (5) demonstrates, sentences categorized as hasCA contained a more conventional competing alternative. For example, in "The magician disappeared/vanished the rabbit," verbs like "disappear" (high frequency) and "vanish" (low frequency) were used in a causative construction, prompting participants to favor the alternative construction, "The magician made the rabbit disappear," which aligns with standard usage.

(5) Novel sentences with a clear competing alternative phrasing (novel/hasCA)
a. Amber explained/recited Zach the answer.
b. Anthony's merciless teasing cried/sobbed his little sister.
c. Daniel forced/coerced that Helen compete.
d. Jacob fell/tumbled the lamp.
e. Kayla's boss considered/contemplated to give her a raise.
f. Please find/locate a new pen to me.
g. The magician disappeared/vanished the rabbit.

In contrast, as (6) illustrates, noCA formulations, such as "The lifeguard swam the children to the shore," used verbs like "swim" and "backstroke" in an unconventional manner without a clear alternative expression, as indicated by low consensus among respondents.

(6) Novel sentences without a clear competing alternative phrasing (novel/noCA)
a. Jeff slept/napped the afternoon away.
b. Megan smiled/grinned her boyfriend out the front door.
c. Terry's horse jumped/hopped her straight out of the saddle.

d. The chief will laugh/chuckle you back to your desk job.
e. The lifeguard swam/backstroked the children to shore.
f. The performer sang/crooned the audience into another dimension.
g. The shopkeeper shouted/hollered the teenagers out of the building.

To address the third research question on how learners' L1 typology influences the processing of L2 caused-motion constructions, a paraphrase test was performed, following the methodology of Robenalt and Goldberg (2015). Participants were asked to provide a paraphrase only when they judged a novel sentence to be unacceptable; otherwise, they were instructed to copy the sentence as presented.

3.3. Procedure, Coding, and Analysis

Before the AJT, participants completed three practice trials adapted from Ambridge et al. (2008), following Robenalt and Goldberg's (2015, 2016) procedure. The first two testing items provided worked examples (one unambiguously acceptable sentence and one unambiguously unacceptable sentence), and the third trial required a free-response judgment to familiarize participants with the response format. Participants who failed to rate the practice items in the intended direction were excluded as an instruction/attention check. This exclusion criterion was adopted to ensure that subsequent acceptability ratings reflected task comprehension rather than accidental misclicks or misunderstanding of the scale. In total, 7 participants were excluded based on this criterion (EFL_K = 3, EFL_C = 4).

For the AJT, participants rated sentence acceptability on a 5-point Likert scale, with 5 representing complete acceptability, 3 indicating neutral acceptability, and 1 reflecting complete unacceptability. Participants first completed three practice items, which included sentences clearly marked as either acceptable or unacceptable, to ensure they understood the task. Those who failed to rate the practice items accurately were excluded from the analysis. Practice materials and instructions were adapted from Ambridge et al. (2008). To aid comprehension, definitions of difficult words were provided beneath each sentence, and a link to translations of the target stimuli was made available. Data analysis was conducted using R software (R Development Core Team 2008), employing mixed-effects models with the lme4 package (Bates et al. 2013).

All acceptability ratings were analyzed using linear mixed-effects models implemented in the lme4 package in R (Bates et al. 2013).[5] Fixed effects included sentence type (baseline, hasCA, noCA), verb frequency (high, low), and language group (EFL_K, EFL_C), as well as all two-way and three-way interactions among these factors. Random intercepts were specified for participants and verb pairs, and by-participant random slopes for sentence type and verb frequency were included where the model converged.[6] The initial model included both language

[5] Although acceptability judgments were collected using a 5-point Likert scale, linear mixed-effects models were employed for analysis. Parametric models have been shown to be robust to violations of interval-level assumptions when Likert scales contain five or more response categories (Norman 2010, Mircioiu and Atkinson 2017). Moreover, linear mixed-effects modeling is widely adopted in psycholinguistic research on acceptability judgments, including prior work on L2 entrenchment and statistical preemption (Robenalt and Goldberg 2015, 2016). This approach allows for the simultaneous modeling of fixed effects and random variation across both participants and lexical items, thereby providing a statistically appropriate framework for examining interaction effects in experimental language data (Baayen et al. 2008). I thank an anonymous reviewer for drawing attention to this methodological issue.

[6] Categorical predictors were coded using treatment (dummy) coding. In analyses including baseline sentences, baseline was set as the reference level for sentence type; in analyses excluding baseline items, hasCA served as the reference level. High-

groups in a single analysis to directly test group differences and interactions with sentence type and verb frequency. To address the second research question focusing specifically on novel sentences, a follow-up model was run excluding baseline items and setting hasCA as the reference level.

To avoid repetition and contrast effects, the 56 target sentences were distributed across six counterbalanced lists using a Latin square design, such that each participant saw only one member of each high–low verb pair. Each list contained 28 target items (14 baseline, 7 hasCA, 7 noCA), along with three filler sentences. The six lists were constructed so that verb frequency (high vs. low), construction type, and competing-alternative status were fully rotated across participants. All lists were pseudorandomized prior to administration. The order of presentation was further constrained such that no two sentences containing semantically related verbs or the same construction type appeared consecutively. This design follows and extends the counterbalancing procedure used in Robenalt and Goldberg (2015, 2016).

Following the procedure of Robenalt and Goldberg (2015, 2016), a paraphrasing task was embedded within the acceptability judgment task. After rating each sentence on the 5-point scale, participants were prompted to complete a paraphrase only if they judged the sentence to be unacceptable (ratings of 2 or below). When participants judged a sentence as acceptable, they were instructed to copy the sentence exactly as written. The purpose of this task was to determine whether participants were able to generate a readily available competing formulation for novel sentences, thereby providing behavioral evidence of competition dynamics. Paraphrase responses were coded into three categories following the procedure of Robenalt and Goldberg (2015). Responses were classified as accepted as written when participants reproduced the original sentence exactly, indicating that they perceived no need for reformulation. Responses were classified as paraphrased with the intended meaning preserved when participants reformulated the sentence while maintaining the same core meaning. Finally, responses were categorized as other when they were ungrammatical, semantically altered, or otherwise uninterpretable. Two independent coders classified all paraphrase responses, and disagreements were resolved through discussion with a third coder, following the coding procedure described in Robenalt and Goldberg (2015, 2016).

For the paraphrase test, participants paraphrased the 14 verb pairs in novel formulations. The responses were reviewed and categorized by two coders (the first author and an assistant who was unaware of the study's hypotheses) as "accepted as written" or "paraphrased with the intended meaning preserved." Agreement between the coders was 92%, and any disagreements were adjudicated by a third coder. Minor changes, such as the addition or removal of adverbs that did not change the argument structure of the verb (e.g., altering "The chief will laugh you back to your desk job" to "The chief will laugh you right back to your desk job"), were classified as exact repetitions. [7]Ungrammatical or misinterpreted sentences (38 instances, 6% of the data) were excluded from further analysis. For noCA constructions, which involved intransitive verbs used in English caused-motion constructions, paraphrases were analyzed using Sung's (2019) framework to gain a deeper understanding of participants'

frequency verbs were used as the reference category for verb frequency, and EFL_C was set as the reference level for learner group. I thank an anonymous reviewer for prompting clarification of this coding scheme.

[7] The label "misinterpreted" was applied only when a participant's paraphrase indicated a semantic construal that was incompatible with the intended caused-motion meaning of the stimulus. For example, responses that reanalyzed the verb as a simple intransitive event (e.g., interpreting "The lifeguard swam the children to the shore" as meaning that the lifeguard made the children swim to the shore) were classified as misinterpretations. Ungrammatical responses were those that violated basic English clause structure (e.g., missing arguments or ill-formed verb phrases). All excluded items were independently coded by two trained coders, and disagreements were resolved through discussion. These exclusions accounted for 6% of the total data and were removed to ensure that the analyses targeted only responses reflecting the intended constructional meaning.

intuitions and the influence of their L1 typological background. To maintain anonymity, participants were identified by codes based on their generational group and participant number, such as Participant K_1.

To minimize potential bias, all responses were anonymized and re-coded with random numeric identifiers prior to coding. The coders did not have access to any information regarding participants' language background or group membership. Although the original participant codes contained group labels, these were removed before the coding stage. The first author was not involved in the initial coding.

4. Results

4.1 Acceptability Judgment Test (AJT)

Figure 1 illustrates the acceptability ratings of Korean EFL learners (EFL_K) and Chinese EFL learners (EFL_C) across three sentence types—baseline, hasCA, and noCA—using high- and low-frequency verbs[8]. Descriptive statistics indicate that both groups rated baseline sentences higher than the two novel constructions (hasCA and noCA). In addition, across conditions, sentences containing high-frequency verbs tended to receive higher ratings than those with low-frequency verbs.

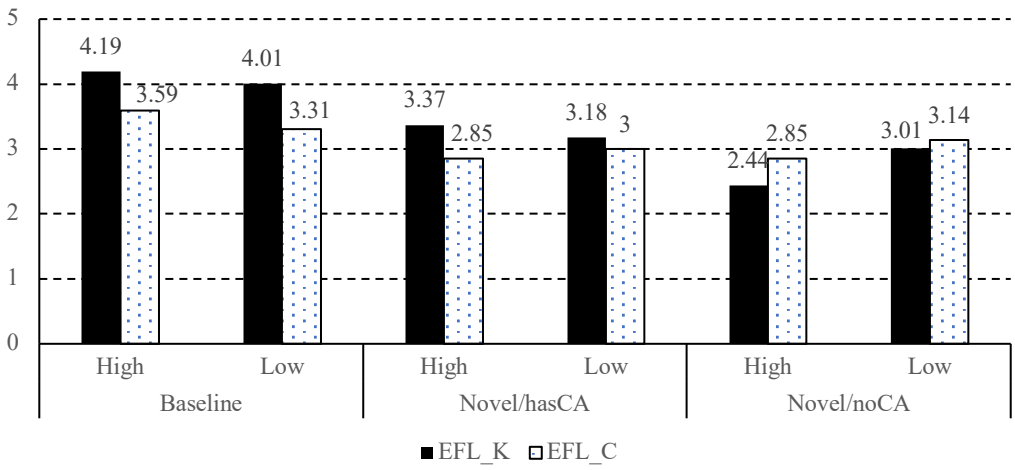

Figure 1. Sentence Acceptability Ratings for EFL_K and EFL_C

For hasCA constructions, ratings for high- and low-frequency verbs showed only small differences within each group. For noCA constructions, both groups exhibited a stronger tendency to rate low-frequency verbs higher than high-frequency verbs, with this pattern being more pronounced for the EFL_K group than for the EFL_C group.

[8] As a reference point for interpreting the L2 results, native speaker ratings reported in Robenalt and Goldberg (2015) exhibit a systematic pattern across sentence types and verb frequency conditions. For baseline sentences, high-frequency verbs (M = 4.87, SD = .44) and low-frequency verbs (M = 4.70, SD = .66) were rated as acceptable. For novel sentences with a competing alternative (hasCA), high-frequency verbs (M = 1.91, SD = 1.07) and low-frequency verbs (M = 2.14, SD = 1.12) received lower acceptability ratings. For novel sentences without a competing alternative (noCA), high-frequency verbs (M = 3.17, SD = 1.34) and low-frequency verbs (M = 2.93, SD = 1.36) were rated more favorably than hasCA sentences. This native speaker pattern provides a benchmark against which the L2 learners' acceptability judgments can be interpreted.

The inferential analyses reported below examine the effects of sentence type, verb frequency, and group on acceptability judgments.

4.1.1 Analytic statistics (1): Initial model with baseline

A linear mixed-effects model was fitted to examine the effects of Group (EFL_K vs. EFL_C), Sentence Condition (baseline, hasCA, noCA), and Verb Frequency (high vs. low), including all interaction terms, on acceptability ratings (See Appendix A for the complete list of interaction terms). This baseline-inclusive model provides a global estimation of the interaction structure across all sentence types and serves as an initial test of whether group differences are modulated by sentence condition and verb frequency. Table 2 presents the three-way interaction terms from the model including baseline sentences.

Table 2. Three-way Interaction Effects (Baseline included)

Interaction	*Estimate*	*SE*	*t*	*p*
Group × hasCA × Low VF	-.43	.15	-2.90	.004**
Group × noCA × Low VF	.14	.14	.96	.34

Note 1. Reference levels: EFL_C, Baseline, High VF
Note 2. *** $p < .001$, ** $p < .01$, * $p < .05$

A significant three-way interaction was observed for Group × hasCA × Verb Frequency (*Estimate* = -.43, *SE* = .15, *t* = -2.90, *p* = .004), whereas the corresponding three-way interaction for the noCA condition was not significant (*Estimate* = .14, *SE* = .14, *t* = .96, *p* = .34). Since the three-way interaction tests whether frequency effects differ across learner groups as a function of construction type, it is interpreted prior to lower-order interactions. The significant Group × hasCA × Verb Frequency interaction indicates that the magnitude of the frequency effect within the hasCA condition differed across learner groups. In contrast, no differential frequency effects across groups were observed in the noCA condition in the baseline-inclusive model. Table 3 presents the two-way interaction terms from the baseline-inclusive model.

Table 3. Two-way Interaction Effects (Baseline Included)

Interaction	*Estimate*	*SE*	*t*	*p*
Group × noCA	-1.08	.11	-10.18	<.001***
Group × hasCA	-.05	.11	-.44	.66
hasCA × Low VF	.42	.12	3.46	<.001***
noCA × Low VF	.63	.12	5.28	<.001***
Group × Low VF	.07	.08	.82	.41

Note 1. Reference levels: EFL_C, Baseline, High VF
Note 2. *** $p < .001$, ** $p < .01$, * $p < .05$

As shown in Table 3, the interaction between Group and the noCA condition was significant (*Estimate* = -1.08, *SE* = .11, *t* = -10.18, $p < .001$), indicating differential acceptability patterns across learner groups in the noCA condition. In contrast, the Group × hasCA interaction was not significant (*Estimate* = -.05, *SE* = .11, *t* = −.44, *p* = .66), suggesting that the two learner groups did not differ reliably in their evaluation of hasCA constructions relative to the baseline condition. In addition, significant interactions between Sentence Condition and Verb Frequency were observed for both hasCA constructions (*Estimate* = .42, *SE* = .12, *t* = 3.46, $p < .001$) and noCA constructions (*Estimate* = .63, *SE* = .12, *t* = 5.28, $p < .001$), demonstrating that the effect of verb frequency varied

across sentence types. However, the interaction between Group and Verb Frequency was not significant (*Estimate* = .07, *SE* = .08, *t* = .82, *p* = .41), indicating that overall frequency sensitivity did not differ reliably between EFL_K and EFL_C when sentence condition was not taken into account. Importantly, the significant Sentence Condition × Verb Frequency interactions (hasCA × Low VF; noCA × Low VF) show that verb frequency exerts different effects across sentence types relative to baseline, providing the lower-order pattern that the three-way interaction further qualifies by learner group. To identify the source of these interaction effects, follow-up contrasts comparing EFL_K and EFL_C across sentence conditions and verb frequency were conducted. The results are reported in Table 4.

Table 4. Linear Mixed Model for Acceptability Rating between EFL_C and EFL_K (Baseline Included)

Random Effects	Group	*SD*			
Subject (intercept)	EFL_C	.56			
	EFL_K	.4			
Verb pair (intercept)	EFL_C	.11			
	EFL_K	.35			
VF (slope)	EFL_C	.16			
	EFL_K	.27			
Fixed Effects	Group	*Estimate*	*SE*	*t*	EFL_K vs. EFL_C
(Intercept)	EFL_C	3.94	.26	14.87	
	EFL_K	4.19	.27	15.79	
High→Low VF	EFL_C	-.27	.07	-3.69*	*t* = .28, *p* = .77
	EFL_K	-.18	.09	-2.12*	
Baseline→hasCA	EFL_C	-.71	.07	-9.15***	*t* = -.38, *p* = .70
	EFL_K	-.78	.07	-11.19***	
Baseline→noCA	EFL_C	-.78	.1	-7.39***	*t* = -10.28, *p* < .001***
	EFL_K	-1.56	.09	-17.09***	

Note 1. VF refers to verb frequency. Sentences labeled as hasCA contain a competing alternative expression, whereas those labeled as noCA do not contain a competing alternative.
Note 2. *** *p* < .001, ** *p* < .01, * *p* < .05

As shown in Table 4, both learner groups showed a significant preference for high-frequency verbs over low frequency ones in baseline sentences (EFL_C: *Estimate* = -.27, *SE* = .07, *t* = -3.69, *p* < .05; EFL_K: *Estimate* = -.18, *SE* = .09, *t* = -2.12, *p* < .05), consistent with usage-based accounts in which distributional experience strengthens representations of conventional forms (Ellis, 2002, Ellis et al. 2013). The analysis further shows that both group learners exhibited a significant reduction in acceptability ratings when moving from baseline sentences to novel caused-motion constructions that included a competing alternative (Baseline vs. hasCA). For the EFL_K group, baseline sentences were rated significantly higher than hasCA sentences (*Estimate* = -.78, *SE* = .07, *t* = -11.19, *p* < .001). A similar pattern was observed for the EFL_C group (*Estimate* = -.71, *SE* = .07, *t* = -9.15, p < .001). These within-group contrasts indicate a general tendency to favor more familiar and conventional structures when viable competing alternatives are available, consistent with usage-based accounts of entrenchment and preemption (Ambridge et al. 2008, 2014; Ellis, 2002, Ellis et al. 2013). Both learner groups also showed a significant reduction in acceptability ratings for novel caused-motion constructions without a competing alternative (noCA) relative to baseline sentences. For the EFL_K group, baseline sentences were rated significantly higher than noCA sentences (*Estimate* = -1.56, *SE* = .09, *t* = −17.09, *p* < .001). Similarly, the EFL_C group showed a significant difference between baseline and noCA sentences (*Estimate* = -.78, *SE* = .10, *t* = -7.39, *p* < .001). The larger reduction observed for Korean learners indicates stronger structural rejection of noCA constructions.

Taken together, the three-way interaction (Table 2) and the follow-up contrasts (Table 4) indicate that group differences in frequency sensitivity emerge primarily within non-baseline constructions, motivating a more focused examination of the novel formulations in a baseline-excluded model. Accordingly, the next section re-estimates the model after excluding baseline items to isolate the interaction structure within hasCA and noCA constructions.

4.1.2 Analytic statistics (2): Revised model without baseline

A linear mixed-effects model was fitted to examine the effects of Group (EFL_K vs. EFL_C), Sentence Condition (hasCA vs. noCA), and Verb Frequency (high vs. low), including all interaction terms, on acceptability ratings after excluding baseline sentences. The full fixed-effects output (including all interaction terms) is reported in Appendix B to ensure transparency and reproducibility. This model isolates the interaction structure within the novel formulations (hasCA vs. noCA). Table 5 presents the three-way interaction term from the baseline-excluded model.

Table 5. Three-way Interaction Effects (Baseline Excluded)

Interaction	*Estimate*	*SE*	*t*	*p*
Group × noCA × Low VF	.58	.16	3.58	< .001***

Note 1. Reference levels: EFL_C, hasCA, High VF
Note 2. *** $p < .001$, ** $p < .01$, * $p < .05$

A significant three-way interaction was observed for Group × noCA × Verb Frequency (*Estimate* = .58, *SE* = .16, $t = 3.58$, $p < .001$). This interaction indicates that the frequency effect within the noCA condition differed across learner groups, relative to the hasCA reference condition. Table 6 presents the two-way interaction terms from the baseline-excluded model.

Table 6. Two-way Interaction Effects (Baseline Excluded)

Interaction	*Estimate*	*SE*	*t*	*p*
Group × noCA	-1.10	.12	-9.35	<.001***
Group × Low VF	-.34	.12	-2.80	.005**
noCA × LowVF	.17	.14	1.23	.22

Note 1. Reference levels: EFL_C, hasCA, High VF
Note 2. *** $p < .001$, ** $p < .01$, * $p < .05$

As shown in Table 6, the interaction between Group and Sentence Condition was highly significant (*Estimate* = -1.10, *SE* = .12, $t = -9.35$, $p < .001$), indicating that the difference between hasCA and noCA sentences varied across learner groups. The interaction between Group and Verb Frequency was also significant (*Estimate* = -.34, *SE* = .12, $t = -2.80$, $p = .005$), suggesting group differences in frequency sensitivity. In contrast, the interaction between Sentence Condition and Verb Frequency was not significant (*Estimate* = .17, *SE* = .14, $t = 1.23$, $p = .22$), indicating that the frequency effect did not reliably differ between hasCA and noCA when group was not taken into account.

Together with the significant three-way interaction (Table 5), this pattern indicates that any frequency-by-construction contrast becomes visible only when learner group is taken into account, motivating the follow-up contrasts reported in Table 7.

Table 7. Linear Mixed Model for Acceptability Rating between EFL_C and EFL_K (Baseline Excluded)

Random Effects	Group	*SD*			
Subject	EFL_C	.51			
(intercept)	EFL_K	.37			
Verb pair	EFL_C	.30			
(intercept)	EFL_K	.37			
VF	EFL_C	.20			
(slope)	EFL_K	.38			
Fixed Effects	Group	*Estimate*	*SE*	*T*	EFL_K vs. EFL_C
(Intercept)	EFL_C	2.84	.53	5.35	
	EFL_K	3.03	.75	4.4	
hasCA → noCA	EFL_C	-.02	.19	-.08	t = -8.63, p < .001***
	EFL_K	-.95	.25	-3.79 **	
Low VF * hasCA	EFL_C	.17	.12	1.39	t = -3.09, p = .002**
	EFL_K	-.19	.15	-1.25	
Low VF * noCA	EFL_C	.34	.18	1.89	t = 3.51, p < .001***
	EFL_K	.76	.22	3.45 **	

Note 1. VF refers to verb frequency. Sentences labeled as hasCA contain a competing alternative expression, whereas those labeled as noCA do not contain a competing alternative.
Note 2. *** p < .001, ** p < .01, * p < .05

Table 7 demonstrates that Chinese non-native speakers (EFL_C) did not display a significant difference in acceptability between hasCA and noCA sentences (hasCA → noCA), suggesting they do not distinguish between these two constructions based on the expectation of competing alternative expressions. While EFL_C participants did not significantly prefer low-frequency verbs within the hasCA context, they rated low-frequency verbs higher than high-frequency verbs in the noCA context, with an estimated increase of .34 (t = 1.89, p = .06) which did not reach statistical significance.

In contrast, Korean non-native speakers (EFL_K) showed a clear distinction between hasCA and noCA constructions (hasCA → noCA). They rated hasCA sentences significantly higher than noCA sentences, with an estimated change of -.95 (t = -3.79, p < .001), reflecting a strong rejection that contrasts with their L1 typology. Additionally, EFL_K participants demonstrated a strong preference for low-frequency verbs in the noCA context (Low VF × noCA), with an estimated increase of +.76 (t = 3.45, p < .001). These findings indicate that EFL_K learners depend on both L1-induced typological constraints and L2 frequency cues, particularly when judging unconventional noCA constructions that are incongruent with the verb-framed typological structure of their native language. However, in the hasCA context, the preference for low-frequency verbs (Low VF × hasCA) was not statistically significant (estimated change = -.19, t = -1.25, p = .23).

Taken together, the significant three-way interaction (Table 5) is driven by the fact that frequency effects within noCA diverge across learner groups, a pattern clarified by the follow-up contrasts (Table 7). These results indicate that sensitivity to construction type (hasCA vs. noCA) and verb frequency is not uniform across groups within the novel formulations, motivating further examination of learners' paraphrase strategies in the next section. In particular, follow-up contrasts (Table 7) show that the between-group divergence is most pronounced in the noCA condition, where EFL_K learners rate noCA items substantially lower than EFL_C learners. This asymmetry is consistent with previous accounts of L1–L2 typological variation in caused-motion constructions (cf. Cabrera and Zubizarreta 2003, Choi 2018, 2020, Folli and Harley 2006, 2020, Kageyama 2003, Kang 2017, Kim 1995, Ko and Sohn 2015, Montrul 2001, Rappaport Hovav and Levin 1998, 2010, Shibatani and Pardeshi 2002, Son 2007, 2008, Tomasello 1992, Zubizarreta and Oh 2007). Accordingly, the next section examines paraphrase data to evaluate whether group differences in acceptability align with systematic differences in structural choices.

4.2 Paraphrase Test

This section accounts for the third research question by focusing on the results of the learners' responses, namely, whether learners accepted the novel formulation by producing paraphrases. This approach examines the effect of L1 typology on the generation of competing alternative (CA) expressions by EFL_K and EFL_C.

Figure 2 displays the proportion of paraphrases generated by Korean EFL learners (EFL_K) and Chinese EFL learners (EFL_C), illustrating their consistency in producing the most frequent paraphrase for each verb. It demonstrates the proportion of paraphrase responses across construction types: The X-axis represents verb types, and the Y-axis indicates the proportion (%) of participant responses of paraphrase.

Based upon Robenalt and Goldberg (2015), a novel formulation is judged to have a competing alternative (hasCA), if at least half of the participants consistently provide paraphrase expressions. Otherwise, the novel formulation is judged to have no competing alternative (noCA). The solid bar in black in Figure 2 represents the consistency of paraphrase generation for EFL_K participants, while the dotted bar shows that of EFL_C participants. Numerical values on the graph indicate the rate of paraphrase responses for each testing stimulus. The verbs [1] to [7] were judged to be hasCA, and [8] to [14] noCA by native speakers (Robenalt and Goldberg 2015).

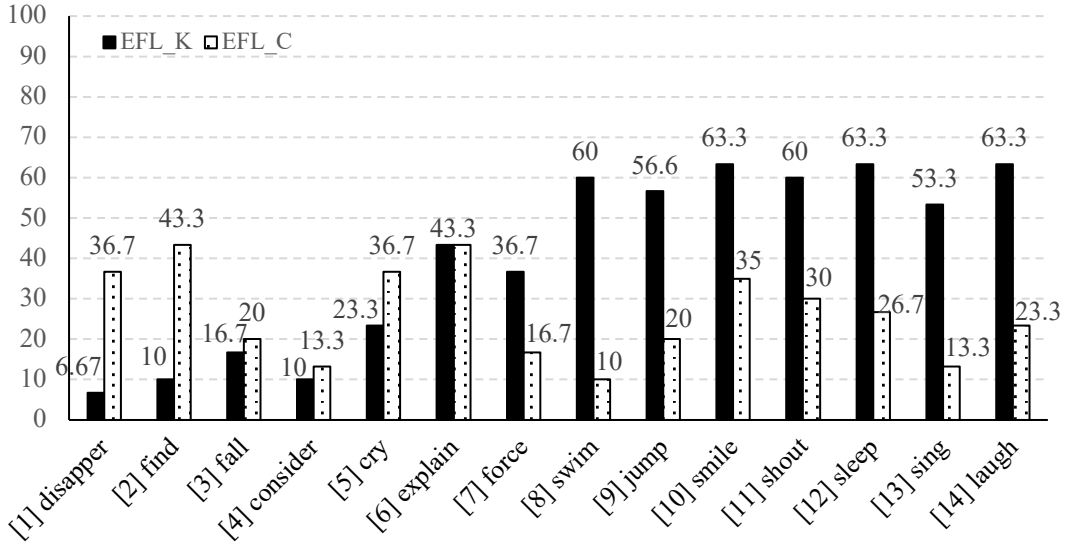

Figure 2. Overall Results of Paraphrase Test by EFL_K and EFL_C

For hasCA constructions involving verbs [1] to [7], as shown in Figure 2, fewer than half of the participants produced conventional paraphrases. Instead, the majority of responses consisted of direct copies of the original novel sentences, suggesting that learners often did not actively reconstruct the sentences using alternative constructions. This pattern contrasts with native speakers, who reliably produced conventional paraphrases for the same items (Robenalt and Goldberg 2015). The hasCA constructions included target stimuli with constructional mismatches (e.g., misuse of transitive constructions for peripheral causatives, ditransitive for prepositional datives, and infinitive complementation for gerundive contexts), which exhibited subtler semantic and syntactic distinctions than those presented by L1 typological variations (Goldberg 2019, Kim 2024, Montrul 2001, Sung 2019).

For verbs such as "disappear" (EFL_K: 33.3%, EFL_C: 6.6%), "find" (EFL_K: 23.3%, EFL_C: 16.7%), "fall" (EFL_K: 36.7%, EFL_C: 16.7%), "consider" (EFL_K: 10%, EFL_C: 10.3%), "cry" (EFL_K: 23.3%, EFL_C: 36.7%), "explain" (EFL_K: 43.3%, EFL_C: 43.3%), and "force" (EFL_K: 36.7%, EFL_C: 16.7%), both groups demonstrated relatively low rates of paraphrase generation, indicating a general lack of producing competing alternative expressions. This pattern supports the hypothesis that L2 learners, especially those with limited proficiency, often struggle to form native-like expectations and constraints in processing L2 constructions (Robenalt and Goldberg 2015).

For noCA constructions involving verbs [8] to [14] in Figure 2, the findings highlight clear L1-induced typological transfer for English caused-motion constructions that are embedded with manner-denoting intransitive verbs. Chinese EFL learners (EFL_C) were predicted to accept these novel formulations, since these expressions align with the typological patterns in their L1. This expectation was confirmed: 80% of EFL_C participants generally copied the stimuli verbatim, while 20% provided paraphrases that primarily employed peripheral causative constructions, as illustrated in (7).

(7) The horse of Terry made her out of the saddle because of its jump. [Participant C_7]
(Target stimulus: *Terry's horse jumped her straight out of the saddle*.)

Korean EFL learners (EFL_K), in contrast, were expected to generate competing alternative expressions using bi-clausal formulations, influenced by their L1 verb-framed typology. This expectation was confirmed, as shown in Figure 2, which reveals high paraphrase rates for verbs, such as "swim" (60%), "jump" (56.6%), "smile" (63.3%), "shout" (60%), "sleep" (53.3%), "sing" (63.3%), and "laugh" (63.3%). Instead of accepting the mono-clausal caused-motion constructions embedded with manner-denoting intransitive verbs, EFL_K participants frequently rejected these verb-construction pairings and resorted to bi-clausal paraphrased expressions. Examples of these paraphrases, which illustrates how EFL_K participants modified the constructions to reflect their L1 typology, are presented in (8) to (11) below.

(8) The lifeguard swam, and saved the children to the shore. [Participant K_13]
(Target stimulus: *The lifeguard swam the children to the shore*.)

(9) Megan smiled, and that made her boyfriend go out of the front door. [Participant K_47]
(Target stimulus: *Megan smiled her boyfriend out of the front door*.)

(10) The shopkeeper got the teenagers out of the building by shouting. [Participant K-93]
(Target stimulus: *The shopkeeper shouted the teenagers out of the building*.)

(11) The chief will laugh at you, and he will make you go back to your desk job. [Participant K_107]
(Target stimulus: *The chief will laugh you back to your desk job*.)

These findings paralleled those of previous research, supporting the claim that the constructional repertoire of learners' first language system strongly distorts the processing of L2 constructions (Sung 2019). Specifically, according to a number of studies on linguistic typology (Croft et al. 2010, Talmy 1985), EFL_K's overuse of the by-phrase is a tendency that Korean, or any Verb-framed language, has—that is, it typologically relies upon an individual verb to denote the semantics of a manner and a result. Conversely, English, or any Satellite-framed languages, allows one thematic verb to simultaneously denote the semantics of both manner and result in a mono-clausal formulation (Goldberg 1995). Additionally, EFL_K's overreliance on the use of coordination conjunction

stems from the Korean connective marker, *-seo* ("and"), which denotes temporal relationship between V1 and V2 in Korean Serial Verb Construction (Ko and Sohn 2015) and allows EFL_K to connect two events as a causal-relationship.

5. Discussion

The findings of this study provide evidence consistent with usage-based accounts, highlighting the role of frequency-driven input in shaping L2 learners' constructional representations. At the same time, the results suggest that limited and uneven exposure may give rise to what has been described as noisy L2 representations, in which constructional knowledge remains partially specified or unstable (Grüter et al. 2014, Tachihara and Goldberg 2025). Importantly, the present findings further indicate that such representational variability may arise not only from reduced exposure but also from the systematic influence of L1 typological structure, which can shape learners' acceptability judgments and structural preferences in English caused-motion constructions.

Firstly, the results addressing the first research question indicate that both Korean (EFL_K) and Chinese (EFL_C) learners with moderate English proficiency show a clear preference for high-frequency verbs and conventional constructional forms in English. This pattern is consistent with the conservatism via entrenchment hypothesis (Ambridge et al. 2008, Robenalt and Goldberg 2015) and usage-based accounts, which emphasize the role of repeated exposure in consolidating familiar verb-construction pairings (Ellis 2003, Goldberg 2019). These findings suggest that L2 learners rely on frequency-based information when making acceptability judgments, even under conditions of limited input. At the same time, the variability observed across construction types may reflect partially specified or unstable constructional knowledge, consistent with accounts of noisy L2 representations.

Secondly, the results addressing the second research question reveal contrasting patterns across the two learner groups. Chinese learners (EFL_C) demonstrated reduced sensitivity to the distinction between hasCA and noCA formulations (Robenalt and Goldberg 2015, 2016, Tachihara and Goldberg 2020, 2025). They generally accepted novel verb–construction pairings that native speakers would typically preempt (Robenalt and Goldberg 2015, 2016). These findings are consistent with accounts of noisy L2 representations, in which constructional knowledge remains partially specified under conditions of limited exposure (Tachihara and Goldberg 2020, 2025). In contrast, Korean learners (EFL_K) exhibited a clear differentiation between hasCA and noCA constructions, although this pattern did not align with native-like statistical preemption (Robenalt and Goldberg 2015). Like Chinese English learners, they tended to accept hasCA formulations, but they strongly rejected noCA constructions in which intransitive verbs were embedded in a caused-motion configuration. This asymmetric pattern suggests that their judgments were shaped not only by L2 frequency information but also by L1-based typological constraints.

Importantly, these findings suggest that noisy representations are not reducible to input limitations alone. While reduced exposure and learning context effects account for general instability in L2 constructional learning (Kim and Hwang 2025, Grüter et al. 2014, Tachihara and Goldberg 2025), they do not fully capture the systematic divergence observed across learner groups. The present results instead indicate that noisy representations, that is, variability in L2 representations, may arise from the interaction between restricted L2 exposure and entrenched L1 typological structure (Slobin 1996a, 1996b, Talmy 1985). When L1 typological restrictions conflict with English mono-clausal integration of manner and path, learners' judgments may reflect structural distance rather than a generalized insensitivity to distributional evidence. In this respect, the findings highlight noisy L2 representations

as a key explanatory construct linking usage-based accounts of probabilistic learning (Goldberg 2019, Robenalt and Goldberg 2015) with typological perspectives on event representation.

Furthermore, the results from the third research question demonstrate that Korean EFL learners consistently rejected English caused-motion constructions embedding manner-denoting intransitive verbs. This pattern is consistent with L1 typological interference, as Korean, a verb-framed language, does not license mono-clausal caused-motion constructions of this type. This typological discrepancy leads Korean learners to avoid English mono-clausal integration of manner and path, instead favoring translation-equivalent bi-clausal structures that align with their L1 typology (Cabrera and Zubizarreta 2003, Kang 2017, Montrul 2001). This parallels with Slobin's (1996a, 1996b) thinking-for-speaking hypothesis, which posits that typological structures persistently shape the organization of conceptual space and influence L2 comprehension and judgment.

Crucially, this pattern reveals a distinct typology-induced source of noisy representation that extends beyond the general instability caused by limited input. Unlike Chinese learners—whose patterns may be more consistent with input-driven variability—Korean learners exhibited a consistent, directional bias rooted in L1 typology. This bias led to systematic undergeneralization, specifically the persistent rejection of L2 structures that conflict with their L1's event-framing typology. This indicates that typology-driven noise may differ qualitatively from input-driven noise: whereas limited exposure produces uncertainty or overgeneralization, L1-based structural misalignment yields stable avoidance even in the presence of frequency evidence. While both groups demonstrated noisy representations associated with limited input, only Korean learners displayed typology-induced noise manifested as structured rejection rather than representational indeterminacy. These findings suggest that noisy representations are not uniform but vary depending on whether instability arises from insufficient exposure or from L1–L2 structural mismatch.

The present findings refine the concept of noisy representations by distinguishing between (a) input-based instability shared across learner groups and (b) typology-driven distortion selectively affecting learners whose L1 diverges structurally from English. By empirically separating these sources, the study advances a more differentiated account of noisy representations, demonstrating that L1–L2 typological mismatch creates a systematic pattern of representational distortion not reducible to input limitations alone. These findings underscore the importance of targeted instructional interventions that explicitly address typological differences, helping EFL learners overcome entrenched L1-based constructional constraints rather than relying solely on increased exposure (Kim and Rah 2021).

The findings of this study offer several pedagogical implications for English language teaching in EFL contexts where learners' L1 typology diverges substantially from English. The persistent rejection of English caused-motion constructions with manner-denoting intransitive verbs among Korean EFL learners illustrates that typology-induced noise is not simply a secondary effect of limited input but a systematic obstacle arising from deeply entrenched L1 constructional schemas. Because the English caused-motion construction is conceptually and structurally connected to the broader English argument-structure construction network—including phrasal-verb constructions—continued reliance on verb-framed L1 patterns may limit learners' ability to acquire not only caused-motion constructions but also productive phrasal-verb constructions that depend on the mono-clausal integration of manner and path (Goldberg 1995, Talmy 1985). This suggests that instructional intervention must explicitly facilitate the unlearning of L1-based representational biases rather than simply increasing exposure to additional L2 input or explicit instruction (Kim and Rah 2021).

6. Conclusion

This study underscores the substantial influence of L1 typological constraints on Korean EFL learners' comprehension and acceptability judgments of English caused-motion constructions. The findings indicate that L1-based representational schemas associated with a verb-framed typology systematically shape Korean learners' evaluation of English mono-clausal caused-motion sentences. Specifically, Korean learners displayed a preference for bi-clausal formulations over English mono-clausal structures, resisting constructions that integrate manner and path within a single clause—a core property of English's satellite-framed system.

This finding aligns with Slobin's (1996a, 1996b) thinking-for-speaking hypothesis, which proposes that typological distinctions in event encoding persist beyond L1 acquisition and continue to influence how speakers conceptualize and evaluate events in an additional language. At the same time, the findings remain compatible with usage-based accounts, particularly entrenchment-based explanations (Ambridge et al. 2008, Robenalt and Goldberg 2015), insofar as learners' judgments reflect sensitivity to previously established representational patterns. However, the present results suggest that frequency-driven experience alone does not fully account for Korean learners' rejection patterns; rather, L1-structured representational biases contribute to a systematic, directionally constrained interpretation of English caused-motion constructions.

Nevertheless, several limitations should be acknowledged. First, although the study employed both high- and low-frequency verbs to examine learners' sensitivity to statistical preemption, the assessment of L2 proficiency relied solely on a C-test measure. While the C-test is efficient and widely validated for capturing general language competence, it does not fully index productive skills such as speaking and writing. Incorporating measures of productive proficiency in future work would offer a more comprehensive understanding of how different dimensions of proficiency interact with learners' constructional representations.

Second, in examining learners' sensitivity to novel caused-motion constructions with and without competing alternatives (hasCA/noCA), the present study was limited to participants with mid-range proficiency. Future research should include learners across a broader proficiency spectrum—including higher-proficiency EFL learners—to determine whether typologically induced constraints diminish with increased exposure or whether they remain stable even at advanced levels. Longitudinal designs would also help clarify how constructional knowledge develops as learners accumulate more robust, less noisy input over time.

Third, although the two learner groups were broadly comparable in general English proficiency, other dimensions of language experience—such as length and type of exposure, private education, overseas residence, and additional language proficiency—were not systematically measured. In particular, the potential influence of L3 Korean on the English performance of the Chinese participants could not be examined. Future research should incorporate more fine-grained proficiency measures and multilingual background profiles to disentangle the effects of typology from those of broader language experience.

One important limitation concerns the provision of brief definitions for unfamiliar words and optional links to translations of the target stimuli. This support was necessary to ensure basic sentence comprehension, given that several low-frequency verbs were unlikely to be known by all participants. However, this design choice may have unintentionally reduced the strength of the frequency manipulation, as participants could rely on paraphrased meanings rather than on their existing lexical representations. Moreover, providing access to translations may have amplified L1-mediated processing, thereby increasing the influence of learners' first language during judgment and paraphrasing. Because the extent to which individual participants relied on these supports was not tracked, it is not possible to determine how much they may have contributed to variability in the results. Future studies should

more carefully control lexical familiarity and independently assess participants' knowledge of target items to avoid such confounds.

Taken together, the findings underscore the need for instructional practices that explicitly address L1-L2 typological contrasts and provide targeted exposure to constructions that diverge from learners' L1-based event-encoding argument structure construction patterns. Such interventions may help learners overcome typology-driven biases while fostering more stable and native-like constructional expectations in English.

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Examples in: English
Applicable Languages: English
Applicable Level: Tertiary

Appendix A. Fixed Effects of the Linear Mixed-Effects Model (With Baseline)

Term	*Estimate*	*SE*	*df*	*t*	*p*
(Intercept)	3.58	.21	921.70	17.00	< .001***
Group (EFL_K)	.66	.09	575.97	7.51	< .001***
hasCA	-.71	.09	7576.46	-7.93	< .001***
noCA	-.53	.11	6242.54	-5.00	< .001***
Low VF	-.25	.07	7581.65	-3.62	< .001***
Group × hasCA	-.04	.11	7582.55	-.44	.659
Group × noCA	-1.07	.11	7587.13	-10.18	< .001***
Group × Low VF	.07	.08	7576.14	.82	.413
hasCA × Low VF	.42	.12	7577.11	3.46	< .001***
noCA × Low VF	.63	.12	7575.43	5.28	< .001***
Group × hasCA × Low VF	-.43	.15	7571.70	-2.90	.004**
Group × noCA × Low VF	.14	.14	7569.81	.96	.338

Appendix B. Fixed Effects of the Linear Mixed-Effects Model (Without Baseline)

Term	*Estimate*	*SE*	*df*	*t*	*p*
(Intercept)	3.02	.49	32.23	6.08	< .001 ***
Group (EFL_K)	.65	.11	923.9	5.83	< .001 ***
noCA	.12	.24	17.73	.52	.611
Low VF	.13	.10	4999	1.30	.194
Group × noCA	-1.10	.12	4994	-9.35	< .001 ***
Group × Low VF	-.34	.12	5016	-2.80	.005 **
noCA × Low VF	.17	.14	4981	1.23	.221
Group × noCA × Low VF	.58	.16	4981	3.58	< .001 ***