Spontaneous Motion in L1- and L2-English Speech: A Corpus-Based Study

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Spontaneous motion is one of the most basic event types, but different languages use varying patterns to express it. For example, English usually encodes path information in prepositional phrases or adverbial particles, while Korean maps path information onto verbs (Talmy, 1985). This study predicts that this typological difference would affect English spontaneous motion expressions produced by Korean learners and analyzes two English-language speech corpora, one, the data from native speakers (600 recordings), and the other, data from L1-Korean learners of English (400 recordings). It finds that the learners significantly underuse satellite-framed patterns, but not verb-framed patterns, compared with the native speakers, suggesting that the L1 plays a role in their L2 production. The satellite-framed patterns, however, account for the greatest portion of spontaneous motion expressions in the L2 corpus, suggesting the dominant effect of input on L2 production. These findings lead to pedagogical implications concerning preventing L1 interference and fostering input-based L2 acquisition.

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1. INTRODUCTION

Languages can organize our perceptual patterns since expressing events, relations, or states of reality requires us to construe and lexicalize the propositional information in particular ways (Bolinger, 1968; Slobin, 1996). Speakers of a language are guided to focus on a limited set of characteristics of reality that are readily encodable in the language, with other characteristics being often unnoticed or ignored, and those noticed characteristics usually take linguistic forms. A body of research on this relationship between language and cognition has explored how language represents fundamental concepts in human experience (Berman & Slobin, 1994; Brown & Chen, 2013; Cadierno, 2004; Choi & Bowerman, 1991; Goldberg, 1995; Ibarretxe-Antuñano, 2017; Im, 2001).

One such concept is spontaneous motion (e.g., she went into the room). Spontaneous motion is one of the most basic event types in human experience and is closely related to the cognitive development of spatial and motional concepts (Goldberg, 1995, 2006; Talmy, 1985). In every human language (and even in animal languages such as bees' communication), spontaneous motion events are frequently encoded in various registers, but each language has its own ways of doing so. Accordingly, speakers of different languages rely on different cognitive patterns when perceiving and construing spontaneous motion events. For example, it has been noted that English makes use of three linguistic patterns to express spontaneous motion (Talmy, 1985):

(1) The ball got into the room.
(2) The dog ran out.
(3) She entered the room.

Sentences (1) and (2) show why English is typologically a satellite-framed language (Talmy, 1985): The schematic information of Path (or change of location) is usually mapped onto a satellite such as a prepositional phrase (e.g., into the room) or an adverbial particle (e.g., out). On the other hand, sentence (3) shows another paradigm for expressing spontaneous motion in English: The schematic information of Path is mapped onto the verb instead of a satellite. This pattern exhibits a special semantic-discoursal condition in which manner of motion is unknown or unimportant to speakers with an exclusive focus being placed on Goal (Flecken, Carroll, Weimar, & Stutterheim, 2015). This pattern is less coherent with the typological characteristics of English and is less frequently used in English than the other two patterns (Hasko, 2010; Slobin, 1997). In contrast, languages such as Korean and Spanish tend to use the latter pattern, that is, the paradigm in which the schematic information of Path is typically mapped onto a verb; these languages are typologically called verb-framed languages.

The further distinction between (1) and (2) is based on another important characteristic of the satellite-framed pattern. The mapping of Path onto a satellite renders the verb slot available for Manner (e.g., run, fly) as in (2), which is not a preferred lexicalization pattern in verb-framed languages.

A question arises as to which type of sentences second language (L2) learners of English would tend to produce when their first language (L1) is a verb-framed language and thus has a typologically different system for encoding spontaneous motion. Considering that input and L1 transfer are the primary factors responsible for L2 acquisition (Schwartz, 1998) attested with L2 learnes from different L1 backgrounds including Korean learners of English (e.g., Kim, 2015), this study formulates two hypotheses to address this question. First, if input is the most important influence, then L2 learners, even those with verb-framed L1s, would tend to produce satellite-framed expressions of spontaneous motion like (1) and (2) more frequently than verb-framed expressions like (3) because satellite-framed patterns are more frequent in the English input. Second, if L1 transfer is the most important influence, L2 learners with verb-framed L1s would tend to underuse satellite-framed patterns like (1) and (2) and overuse verb-framed patterns like (3) which are more compatible with their L1 typological system.

The present study aims to address this issue by examining utterances encoding spontaneous motion events in L2 production data. To this end, a spoken corpus of L1 English and another of L2 English produced by L1-Korean learners are comparatively examined.

2. SPONTANEOUS MOTION IN FRAMING TYPOLOGY

2.1. Motion in English and Korean

Motion events are broadly classified into two types: spontaneous motion and caused motion. Spontaneous motion is voluntary or natural with no external cause of the motion being specified. For example, both (4a) and (4b) are spontaneous motion events, the former voluntary and the latter natural, but (4c) is a caused motion event, with the cause of the ball's motion specified: *The man* rolled it.

(4)   a. The man ran down the hill.
      b. The ball rolled down the hill.
      c. The man rolled the ball down the hill.

Spontaneous motion events are characterized by four schematic features (Talmy, 1985,

1991, 2000): Figure (a moving entity, e.g., a man, a car), Ground (a reference frame with respect to Figure's moving, e.g., a school, a hill), Manner (a specific way that the movement occurs, e.g., run, drive), and Path (the course followed by Figure, e.g., into, ascend). Each language has specific lexicalization and grammatization patterns for encoding these schematic features of a spontaneous motion event (Slobin, 2017; Talmy, 2017), and these patterns have allowed for systematic classifications of human languages into a small set of groups. One such classification has been made by the framing typology, which focuses on the syntactic constituent by which the core feature of Path is mainly expressed (Slobin, 2004; Talmy, 1985).

According to Talmy (1985), English belongs to the satellite-framed languages, which by definition encode Path in satellites such as prepositional phrases (e.g., down the hill) or adverbial particles (e.g., down). The satellite encoding Path is crucial in characterizing a sentence as expressing a spontaneous motion event, as in (5a-b).

(5)   a. The box slid down the hill.
        b. The puck slides well.

The two sentences in (5) have the same verb, *slide*, but only (5a) marks a spontaneous motion event because it has a satellite encoding Path. In contrast, (5b) delivers a general state of the subject (the puck), which is related to motion, but no real motion occurs in the sentence.

The lexicalization pattern of encoding Path in a satellite is dominant in English, with other patterns being used less frequently. For example, English is able to encode Path in a verb (e.g., he entered the room), but this pattern is much less productive, being restricted to special contexts and intentions (Flecken et al., 2015). Instead, verbs of spontaneous motion events often express Manner, with the core feature Path being encoded by satellites (e.g., he ran/jumped/sneaked into the room). This lexicalization pattern of [Manner verb + Path satellite] is very productive in English, allowing native speakers of English to notice and express subtle differences in Manner of motion with the verb. For example, English has a number of verbs expressing various Manners of *walk* such as *sneak, stomp, stride, tiptoe,* and *toddle*.

In contrast, Korean belongs to the verb-framed languages (Choi & Bowerman, 1991; Oh, 2003; Slobin, 2006; Talmy, 2000), which by definition encode Path in verbs. Korean sentences often have serial verbs, and various semantic components can be mapped onto a serial verb construction. However, main verbs usually encode deictic Paths, such as *ka-* 'go' and *o-* 'come', (Choi & Lantolf, 2008; Im, 2002), with a ground-based Path (e.g., enter) or Manner (e.g., run) expressed by subordinate and thus nonobligatory elements, as in (6).

(6) a. Ku-nun   kongwen-uro   ttwui-e tul-e ka-(a)ss-ta.
         he-NOM   park-LOC   run-CON enter-CON go-PAST-DECL

     b. Ku-nun   kongwen-uro   ttwui-e ka-(a)ss-ta. [run go]

     c. Ku-nun   kongwen-uro   tul-e ka-(a)ss-ta. [enter go]

     d. Ku-nun   kongwen-uro   ka-(a)ss-ta. [go]

     e. *Ku-nun   kongwen-uro   tul-ess-ta. [enter]

     f. ?Ku-nun   kongwen-uro   ttwui-ess-ta. [run]

In (6a), the serial verb construction *ttwui-e tul-e ka* is headed by the main verb *ka*, which expresses the deictic Path corresponding to the English verb *go* and combines with the past tense marker *-(a)ss* and the declarative marker *-ta*, while the Manner and Ground-based Paths of motion are expressed by the subordinate verbs *ttwui* and *tul*, respectively. These subordinate verbs are not obligatory for expressing spontaneous motion events, as shown in (6b-d); however, without the deictic Path verb *ka-*, the sentence becomes ungrammatical as in (6e) or loses its meaning of motion (i.e., change of location) as in (6f), which rather depicts the onset of running. Therefore, it has been argued that Korean sentences describing spontaneous motion events tend to encode Path in verbs, with deictic Path mapped onto the obligatory main verb.

2.2. Spontaneous Motion in L2 English by L1-Korean Learners

It has been reported that the differences in lexicalization of spontaneous motion events between L1 and L2 are a major source of difficulties for learners processing an L2. For example, Cadierno (2010) reported that L2 learners of English with verb-framed L1s experience greater cognitive burden in processing satellite-framed constructions of spontaneous motion events (Manner Verb – Prepositional Locative: e.g., the man sneaked into the room) than L2 learners whose L1 is in the same typological group with English. In a similar vein, it has been reported that L2 learners of English whose L1 is verb-framed underuse path satellites and overuse path verbs in their L2 production (Yu, 1996), even at a high level of L2-English proficiency (Stam, 2006).

To explore how L1-Korean learners of English express spontaneous motion events in their L2 English, previous studies have relied on description tasks. The results, however, are not consistent. One group of studies has reported that L1-Korean learners overuse a limited set of English patterns that have corresponding ones in Korean, rendering their utterances repetitive and unnatural (Choi & Lantolf, 2008; Kim, 2009; Kweon, 2016; Park, 2008). For example, the results of Kim's (2009) cartoon-retelling tasks indicate that the L1-Korean participants frequently mapped Path of spontaneous motion events onto the main

verb (e.g., enter, approach), leaving Manner information obscure. Note that this pattern corresponds to how verb-framed languages map path information onto the spontaneous motion construction. A similar finding was made by Choi and Lantolf (2008), who also conducted a cartoon-based task, and they also observed that the participants used hand gestures to show the path of spontaneous motion. Opposing findings, however, have also been reported by studies using picture-description tasks. For example, Kweon (2016) found that L1-Korean participants with high proficiency of L2 English produced native-like expressions of spontaneous motion events, suggesting that L1-Korean learners of L2 English can overcome the typological differences and achieve target-like production.

The inconsistent findings may be due to differences in methodology. While the previous studies all used picture-description tasks, they used different types of pictures in them. It is possible that salient features in each set of pictures affected the perception and conceptualization of spontaneous motion events in the pictures, which in turn would have affected the participants' production.

Studies in this area of research have thus far overlooked the importance of naturally produced data, as opposed to elicited data. Using naturally produced data has been considered very useful for exploring learners' linguistic knowledge in that it usually demands less cognitive burden than other experimental tasks and has no experimental artifacts revealing the researcher's intention; thus it has been popularly used in language acquisition studies (McDaniel, McKee, & Cairns, 1996). Would L1-Korean speakers of L2 English express spontaneous motion events as frequently as native speakers in their natural production? And if they did so, would they tend to map Path onto satellites like native English speakers do, or onto the main verb as in their L1 system? No studies, to date, have addressed this issue with natural production data.

The current study fills this research gap by exploring natural production data in native speaker and learner corpora. The L1 and L2 data were collected during an argumentative speech task that did not highlight spontaneous motion events (cf. Kim & Sung, 2019), which enables us to examine how voluntarily L1 and L2 learners produced what type of spontaneous motion expression. In addition, the corpus data allows us to investigate usage patterns of motion-related verbs in a wider scope encompassing every event type such as spontaneous motion and caused motion and to figure out distributional differences between L1 and L2 production. Therefore, the study addresses the following three questions:

1. How frequently do native speakers and Korean learners of English produce spontaneous motion expressions in their speech?
2. Among the following three patterns, which pattern of spontaneous motion expression is most frequently used by the native speakers and the L2 learners?
   a. Motion$^{\text{V}}$ – Path$^{\text{S}}$ (e.g., The ball got into the room.)

   b. Manner^V – Path^S (e.g., The dog ran out.)
   c. Path^V – Ground^N (e.g., She entered the room.)[1]
3. Are the native speakers and the L2 learners different in the use of motion-related verbs?

For these three research questions, two hypotheses can be considered. If the L1 transfer plays a dominant role in the production of L2 English, the L2 learners would tend to overuse (c), which is consistent with their L1 typological system (i.e., verb-framed languages), while underusing the most productive patterns of spontaneous motion in English, (a) and (b). If L2 learners follow the most frequent pattern in the target language, they would tend to produce sentences like (a) and (b) because they are the dominant patterns in English.

3. METHOD

3.1. Corpora

The study used the International Corpus Network of Asian Learners of English (ICNALE: Ishikawa, 2019). This is a large-scale database containing both written and spoken production of L2 learners from various Asian L1 backgrounds. For each type of production (e.g., monologues, argumentative essays), the ICNALE includes a native reference corpus, which allows researchers to identify specific problems or usage patterns of L2 English in comparison with L1 English.

The two subcorpora of ICNALE analyzed in this study were a native speaker corpus and an L1-Korean learner corpus, both of argumentative speech in English, with recordings of 150 native speakers and 100 learners, respectively. The L1-Korean learners were college students who had studied English for more than 10 years. There were two argumentative topics (i.e., smoking in restaurants and part-time jobs for university students), and every participant was recorded speaking on each topic twice. Therefore, the native speaker corpus comprises 600 recordings, while the learner corpus comprises 400 recordings (see Table 1).

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[1] The superscripts V, S, and N refer to verb, satellite, and noun, respectively.

TABLE 1
Two Corpora of English Argumentative Speech from ICNALE: Native and Learner

	Native Corpus	Learner Corpus
Participants	150 adult native speakers of English	100 adult L1-Korean learners of L2 English
Number of recordings	600	400
Number of words	91,967 (Mean: 153.3)	19,591 (Mean: 49.0)
Token frequency: Clauses	10,750 (Mean: 17.9)	3,114 (Mean: 7.8)
Type frequency: Verbs	595	261
Genre (Topic)	Argumentative speech (smoking in restaurants; part-time jobs of university students)	

The preliminary analysis of the corpora found that the mean number of words per recording in the native corpus (153.3) was three times greater than that in the learner corpus (49.0). Moreover, the native corpus has 10,750 clauses with 595 types of verb, while the learner corpus has 3,114 clauses with 261 types of verbs, which is not unexpected given the English proficiency difference between the two groups.

3.2. Analysis

This study aims at determining the degree to which L1-Korean learners of English underuse or overuse spontaneous motion expressions. The unit of analysis is clauses rather than words because L2 learners tend to produce shorter clauses than L1 speakers, thus producing a greater number of clauses with the same number of words; a word-level analysis could lead to overestimation of the learners' production of the target forms. Therefore, to determine degree of underuse or overuse, the number of clauses in each subcorpus was counted in order to calculate the relative frequency of clause-level spontaneous motion expressions.

Accordingly, every word was POS tagged by the 61-feature CLAWS5 tagset (Garside, Leech, & McEnery, 1997), and every lexical verb was extracted with a concordance line using the POS-based search function of Wordsmith version 5.0. All of the extracted verb phrases were then manually examined because L2 production data usually have many grammatical errors, which may often render POS tagging inaccurate. For example, the word *help* is used as both verb and noun, but L2 errors around the noun *help* might lead the POS tagger to incorrectly label the nominal *help* as a verb. After making sure that no nonverb phrase was counted as a clause, every clause expressing spontaneous motion was coded using the semantic criteria of Figure, Path, and Motion. In addition, every spontaneous motion expression was coded as one of three patterns: [Motion^V – Path^S], [Manner^V – Path^S], and [Path^V – Ground^N]. The results of the coding were then employed

in statistical analyses including chi-squared tests based on absolute token frequencies and odds ratio analysis to find different patterns between the native speaker corpus and the learner corpus in terms of relative type and token frequencies of spontaneous motion events. When significant differences were identified, qualitative investigation followed to reveal the specific difficulties that L2 learners have.

4. RESULTS

4.1. Frequency of All Spontaneous Motion Constructions

The meaning-based coding procedure found 417 tokens of spontaneous motion expressions in the native corpus and only 42 tokens in the learner corpus (see Table 2). These absolute token frequencies of spontaneous motion were then relativized to the condition of one thousand clauses, but the relative frequency was still higher in the native corpus (38.8) than in the learner corpus (13.5). The frequency gap between the two corpora was found to be statistically significant, $\chi^2(1) = 49.31$, $p < .001$, odds ratios = 2.98.

TABLE 2
Frequency of Spontaneous Motion Constructions in the Two Corpora

	Size (clauses)	Absolute Tokens	Relative Tokens	Verb Type	TTR
ICNALE_Native	10,750	417	38.8	20	4.8
ICNALE_Learner	3,114	42	13.5	7	16.7

Note. Relative token frequency is based on one thousand clauses and rounded to one tenth.
TTR = Type-token ratio

The native speakers used 20 different types of verbs for spontaneous motion expressions, while the L1-Korean learners used 7 different types of verbs. While this initially seems to indicate that the native speakers used more various verbs, the type-token ratio (TTR), which measures lexical variations of a linguistic pattern, shows that the learner corpus has greater lexical variation (TTR = 16.7) than the native corpus (TTR = 4.8).

4.2. Frequency of Each Spontaneous Motion Construction

This section examines the use of the three spontaneous motion construction patterns, as characterized by the semantic roles of the verb and the postverbal argument, as in (7a-c):

(7) a. Motion^V – Path^S (e.g., the ball got into the room)
      b. Manner^V – Path^S (e.g., the dog ran out)
      c. Path^V – Ground^N (e.g., she entered the room)

Recall that [Motion^V – Path^S] and [Manner^V – Path^S], as in (7a) and (7b), represent the typological features of the satellite-framed languages (e.g., English), while [Path^V – Ground^N], as in (7c), represents those of the verb-framed languages (e.g., Korean). See Table 3 for the results.

TABLE 3
Frequency of the Three Spontaneous Motion Patterns

Semantic Pattern	Motion^V – Path^S		Manner^V – Path^S		Path^V – Ground^N	
Frequency	Token	Type	Token	Type	Token	Type
ICNALE_Native	365	10	33	7	22	2
ICNALE_Learner	35	4	2	1	5	2

In both corpora, the [Motion^V – Path^S] combination was the most frequent: The native corpus has 365 cases and the learner corpus has 35 cases. However, there was a significant difference between native speakers and L2 learners. Despite the learners' heavy reliance on this pattern (83.3%; 35 out of 42 cases), they were found to have used the pattern significantly less frequently than the native speakers, $\chi^2(1) = 44.46$, $p < .001$, odds ratios = 3.09. The pattern of [Motion^V – Path^S] was also found to have the highest type frequencies of verbs: 10 verb types in the native corpus and 4 verb types in the learner corpus. For the second pattern of spontaneous motion, [Manner^V – Path^S], a significant frequency difference appeared between the two groups. The native corpus has 33 cases of [Manner^V – Path^S] produced with seven verbs, while the learner corpus has only two cases produced with one verb, *walk*; the frequency difference was found to be statistically significant, $\chi^2(1) = 5.65$, $p < .05$, odds ratios = 4.79.

Finally, the third pattern, [Path^V – Ground^N], was examined. This pattern, which characterizes verb-framed languages such as Korean and French, is known to be used by native speakers of English in restrictive ways. It also has been reported that L2 learners of English whose L1 is verb-framed tend to overuse this pattern (Choi & Lantolf, 2008; Kim, 2009). The present study did find that this pattern was the least favored by native speakers of English, accounting for only 5.3% of the cases (22 cases produced with two verbs, *enter* and *leave*). However, this pattern was not found to be overused by the L1-Korean learners of L2 English. Although the ratio of this pattern in spontaneous motion expressions was higher in the learner corpus (11.9%) than in the native corpus (5.3%), the difference was not statistically significant, $\chi^2(1) = 0.2414$, $p = .62$, odds ratios = 1.28.

In sum, the satellite-framed patterns in English that are incompatible with the L1-Korean grammar were significantly underused by the L2 learners, while neither underuse nor overuse was observed for the congruent pattern between L1 and L2, that is, the [Path^V – Ground^N] pattern.

4.3. Analysis of Verb Usage

The corpus analysis revealed that the learners significantly underused the two satellite-framed patterns of spontaneous motion expressions, [Motion^V – Path^S] and [Manner^V – Path^S], compared to the native English speakers. Only in the other pattern, [Path^V – Ground^N], the L2 production was not significantly different from the L1 production. This section examines the usage patterns of spontaneous motion expressions in the two corpora to identify specific areas of difficulty in the L2 production of such expressions. More specifically, it investigates whether the underuse co-occurred with the overall underuse of relevant verbs, or with the use of the relevant verbs for non-motion events.

The native speaker corpus has 596 types of verb in a total of 10,750 clauses, while the learner corpus has 261 types of verb in a total of 3,114 clauses. Among the verb types, small sets were identified as possible components of each of the three spontaneous motion constructions: 13 types for [Motion^V – Path^S], 16 types for [Manner^V – Path^S], and 3 types for [Path^V – Ground^N], as shown in Table 4.

TABLE 4
Verb Types Relevant to Each Spontaneous Motion Pattern[2]

Pattern	Verb Types
Motion^V – Path^S (e.g., go to the park)	come, drop, escape, fall, get, go, head, move, pass, return, sit, take, turn (13 verbs)
Manner^V – Path^S (e.g., fly to the moon)	blow, bump, collapse, doze, drift, drive, fly, juggle, linger, roll, sink, skip, step, swing, travel, walk (16 verbs)
Path^V – Ground^N (e.g., enter the room)	approach, enter, leave (3 verbs)

The 13 types of verbs for [Motion^V – Path^S] appeared significantly more frequently in the native speaker corpus (1,052 times) than in the learner corpus (209 times), $\chi^2(1) =$

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[2] Any meaning-based classification of motion verbs needs to address the complex nature of verb semantics. As noted in Talmy (2000), many verbs conflate multiple meanings (e.g., roll: Move+ Manner) and focus on different semantic aspects such as deixis (e.g., go away) or activity (e.g., go to school). The classification in Table 4, therefore, relies on two testable standards: a) whether the verb is formally and functionally comparable to verbs of Manner (e.g., I am running down), and b) whether the verb is used with a path satellite (e.g., pass by the smoking section) or a ground noun (e.g., leave the restaurant).

27.60, $p < .001$, odds ratios = 1.51. In addition, the proportion of the total tokens of these verbs used to refer to spontaneous motion events was significantly higher in the native speaker corpus (34.7%) than in the learner corpus (16.7%), $\chi^2(1) = 25.94$, $p < .001$, odds ratios = 2.64. In short, the native speakers used motion-related verbs more frequently than the L1-Korean L2 learners, and these verbs were more likely to express spontaneous motion events in the native speech than in the learner speech.

For example, the verb *get*, which can encode spontaneous motion in the pattern of [Motion^V – Path^S] (e.g., get in the car), appears 348 times in the native corpus, and 32 of these cases actually express spontaneous motion. A qualitative analysis found that the spontaneous motion cases of *get* in the native corpus involve both animate (e.g., he) and inanimate subjects (e.g., smoke), with inanimate subjects (18 tokens) being slightly more frequent than animate ones (14 tokens). The verb *get* is also frequent in the learner corpus, though not as frequent as in the native speaker corpus, appearing 125 times, but none of the tokens expresses spontaneous motion. Most tokens of *get* in the learner corpus express resultative (e.g., get tired) or transitive events (e.g., get a job), and both types of events are usually experienced by animate subjects.

Another interesting difference was observed for the verbs for [Manner^V – Path^S]. When the 16 types of verb relevant to the pattern were counted, the native speaker corpus again showed a significantly greater token frequency than the learner corpus: 75 tokens versus 5 tokens, $\chi^2(1) = 12.14$, $p < .001$, odds ratios = 4.37. The proportion that referred to spontaneous motion was, however, similar between the native speaker corpus (44%) and the learner corpus (40%), $\chi^2(1) = 0.03$, $p = .86$, odds ratios = 1.18. That is, the native speakers used manner verbs much more frequently than the learners, but the likelihood of these verbs being employed to express spontaneous motion events in L2 speech was as high as it was in native speech.

The low frequency of manner verbs in the learner corpus may be attributed to a lack of lexical knowledge among the L2 learners. For example, the verb *travel* has multiple meanings in English, including one denoting physical movement of an inanimate object, as in the following definition, from the Collins Cobuild Advanced Learner's English Dictionary (Sinclair, 2009).

Travel [V.]: When light or sound from one place reaches another, you say that it travels to the other place.

The native speakers appeared to have this lexical knowledge. They used the verb *travel* 14 times, and half of these cases expressed spontaneous motion (e.g., the smoke travels through the air). Such usage pattern for the movement of inanimate objects was not observed in the learner corpus. Instead, the verb *travel* was exclusively used for its

prototypical meaning of journey.

Finally, three types of verb that can be used for the [Path^V– Ground^N] pattern were found in the corpus data: *approach, leave*, and *enter*. These verbs were used 46 times in the native speaker corpus and 9 times in the learner corpus, with no significant between-corpus difference: $\chi^2(1) = 1.18$, $p = .28$, odds ratios = 1.48. In addition, the proportion of these verbs used for spontaneous motion was not significantly different between native speakers (47.8%) and L2 learners (55.6%), $\chi^2(1) = 0.18$, $p = .67$, odds ratios = 0.73. Yet while the two corpora apparently show similar production patterns for the [Path^V – Ground^N] expression, the semantic nature of Ground appeared to differ between the native speaker and the L2 learner production. For example, the native speakers used the verb *leave* with inanimate, locative Ground terms (e.g., university, restaurant), but the learners used the verb *leave* with human Ground terms (e.g., parents) indicating relationship. This may show that the concept of spontaneous motion is less concrete in L2 English.

5. DISCUSSION AND CONCLUSION

The present study has comparatively examined the usage of spontaneous motion expressions in native speaker and learner corpora of English speech, focusing on three mapping patterns: [Motion^V – Path^S], [Manner^V – Path^S], and [Path^V – Ground^N]. It found, first, that L1-Korean learners of L2 English produce spontaneous motion expressions significantly less frequently than native speakers of English do. This result is striking given that spontaneous motion is a fundamental concept in human experience (Goldberg, 1995; Talmy, 1985). Why then do these learners not conceptualize and express spontaneous motion events as frequently as native speakers do?

A plausible account is that the difference is due to an L1 effect. That is, the typological difference in the two languages' ways of expressing spontaneous motion might hinder L1-Korean speakers of L2 English from producing spontaneous motion expressions in English (Choi & Lantolf, 2008; Park, 2008). L2 learners differ from native speakers in terms of preference for certain lexicalization patterns (Cadierno & Ruiz, 2006; Hasko, 2010), which suggests that in L2 production less preferred patterns may be underused or avoided. The L1-Korean speakers might underuse the prototypical spontaneous motion patterns in English (i.e., [Motion^V – Path^S], [Manner^V – Path^S]) because they do not correspond to their preferred L1 pattern (i.e., [Path^V – Ground^N]). This account is supported by the results of this study's second inquiry. The second research question concerned the specific locus of the learners' comparative underuse, and the study found that the underused patterns were [Motion^V – Path^S] and [Manner^V – Path^S], but not [Path^V – Ground^N]. That is, the results support the suggestion of an L1 effect, as the learners' usage could emerge from a tendency

to avoid patterns that do not correspond to their L1's typological features.

However, it is also important to note that the pattern that does correspond to the L1 typological system, [Path^V – Ground^N], was not overused by the L2 learners. The previous studies, which used picture-description tasks, claimed that the underuse (or avoidance) of satellite-framed patterns among L2 learners with verb-framed L1s is due to (a) their preference for the verb-framed mapping pattern (i.e., [Path^V – Ground^N]) and (b) their replacement of the less preferred patterns with the more preferred one (Kweon, 2016; Park, 2008). This account, however, does not hold for the current study. Recall that the verb-framed mapping pattern of [Path^V – Ground^N] constituted the smallest proportion of spontaneous motion expressions not only in the native speaker corpus but also in the learner corpus. This suggests that the satellite-framed patterns were simply underused in L2 speech, perhaps due to the differences in lexicalization patterns between the learners' L1 and L2, but not that the satellite-framed patterns were replaced by the verb-framed pattern. A question arises: Why did these L2 learners not overuse the [Path^V – Ground^N] pattern?

A possible answer is that the learners' usage results from an input frequency effect. Although the [Path^V – Ground^N] pattern corresponds to the learners' L1 typological system, the pattern would be the least frequent in the English input. It seems plausible that the L2 learners did not overuse the [Path^V – Ground^N] pattern because it does not abound in the input. On the other hand, the satellite-framed patterns (i.e., [Motion^V – Path^S], [Manner^V – Path^S]) are prototypical for English, which in turn suggests that they are the most frequent L2 input to describe spontaneous motion events. Indeed, the [Motion^V – Path^S] pattern was the most frequent type of motion expressions in the native speaker corpus, which implies the same pattern may have been the most frequent in L2 input, and the same pattern accounted for the greatest portion of spontaneous motion expressions in the learner corpus (35 out of 42 cases, 83.3%).

These results thus show an interplay of an L1 effect and L2 input. The verb-framed lexicalization patterns of the learners' L1-Korean grammar may have inhibited the learners from using the satellite-framed patterns as productively as native speakers do. At the same time, more frequent exposure to the satellite-framed patterns guided the L2 learners to use them more frequently than the verb-framed pattern. This interplay has not been given due attention, as previous studies have focused on preferences between two typologically distinct patterns in experimental settings.

We also identified a specific area of difficulty in the L2 underuse of the satellite-framed patterns. The L2 learners produced the verbs relevant for the satellite-framed patterns significantly less frequently than the native speakers, regardless of whether the verbs were used to express spontaneous motion or not. This lack of motion-related verbs in L2 production may be analyzed as another aspect of the L1 effect. Speakers of verb-framed

languages have been known to rely on nondynamic expressions of events that take place in geographical contexts such that listeners or readers must guess the unsaid dynamic events (Ohara, 2002; Slobin, 1997). If this discourse pattern is characteristic of Korean, the L2 learners might have followed the discourse pattern of their L1 and used fewer dynamic verbs with many dynamic events including spontaneous motion construed implicitly. Concluding that this is actually the case would require an in-depth investigation of the Korean language, but the general tendency observed in verb-framed languages suggests the plausibility of this assumption.

Overall, the current study has shown that the differences in lexicalization patterns between L1 and L2 can leave space for L1 interference in L2 production, even for those who are assumed to have received a considerable amount of L2 input for more than 10 years of foreign language learning. At the same time, target language input plays an important role in L2 production, as shown by the finding that the satellite-framed pattern of $[\text{Motion}^V - \text{Path}^S]$ was the most frequent in both the native speaker corpus and the learner corpus. Future research is required to identify whether similar analyses can be applied to other types of naturally produced L2 data such as narratives and how L1 and L2 knowledge of spontaneous motion is linguistically extended to the neighboring domains such as fictive motion (e.g., the bridge runs over the river). These efforts are expected to inform us how we can make use of L2 input to overcome L1 effects in the acquisition and use of target-like typological features.

The finding that both typological characteristics of L1 grammar and usage patterns in L2 input affect Korean learners' expressions of spontaneous motion leads to a couple of pedagogical implications. First, in order to reduce the negative L1 influences that may result in underuse of particular patterns or paucity of dynamics, L2 English input should be more carefully provided to Korean learners. Second, when input-based L2 learning alone turns out insufficient to help learners overcome the typological differences between L1 and L2, other instructional treatments (e.g., explicit teaching, production practices) can be usefully considered.

Applicable levels: Tertiary

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