



## An Experimental Study of Lexical Encoding and Grouping in L1 and L2 Production of Sentences Describing Motion Events

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### ABSTRACT

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This study investigated the implicit processes that English L1 speakers and Korean learners of L2 English undergo when they produce sentences describing motion events. On the basis of Talmy's (2000a, 2000b) crosslinguistic typology of lexicalization patterns, it was hypothesized that Korean L1 speakers would use the strategy of conflating the path morpheme into a motion verb or having it adjoined to a ground reference rather than encoding it separately. Experimental data were collected from 62 Korean learners of L2 English at different proficiency levels and 11 English L1 speakers. They were presented with motion-related words or word groups in various sequences and asked to assemble them orally into complete sentences. The results indicated that L1 lexicalization patterns did influence L2 sentence production, with L2 proficiency as a moderating variable. Korean learners of L2 English responded more quickly when a motion verb and a path satellite were presented in pairs than when they were presented as discrete units. This tendency, however, was strong only among lower-intermediate learners, while more advanced learners showed a similar pattern to that of English L1 speakers, suggesting that L1 transfer occurs at the level of morphological processing as well as at lexical selection, though its extent is limited.

### KEYWORDS

motion event, lexicalization pattern, semantic components, thinking for speaking, L1 transfer

## 1. Introduction

In view of cognitive linguistics, concepts are formed from our perceptual and cognitive experiences, which in turn constitute linguistic meanings. How far language impacts on the ways of conceptualizing, and hence lexicalizing, our experiences has long been a subject of controversy and intense research. A number of studies have discussed the relationship between language and cognition from various perspectives (e.g., Comrie 1981, Jackenoff 1990, Lucy 1993, Slobin 1996, Talmy 2000a, 2000b). In particular, one of the central tenets in cognitive linguistics is that the specific lexicogrammatical features of a language tailor the speakers' typical conceptualization of experience (Bavin 1990, Choi and Bowerman 1991, Lucy 1993, Slobin 1996). For example, according to Choi and Bowerman (1991), children learning English and Korean show different sensitivity to language-specific patterns when they talk about motion events from as early as 17-20 months.

In his seminal work, Talmy (2000a, 2000b) has proposed that there are two distinct lexicalization patterns across languages with regards to motion events: satellite-framed languages and verb-framed languages. A motion event refers to a situation involving either movement or maintenance of a stationary location. Motion is categorized into two types: intransitive motion and transitive motion. In the former, it contains self-contained motion, and among them, there are motions that include no change of location in space (e.g., rotation, oscillation, dilation), while the latter indicates motion of an object whose location manifests a change.

Talmy (2000a, 2000b) proposed four major semantic components and two supportive semantic components, describing a motion event. Four major semantic components are Figure (a moving or locative figure), Motion (action or state), Path (the trajectory of motion) and Ground (the goal of the path). The last two supportive components are Manner and Cause of motion. Languages differ with respect to how the framing concept, path, is lexically encoded. In satellite-framed languages like English, path elements are separated from motion verbs. Instead, a particular manner/cause of motion is typically incorporated into them, resulting in a rich (and open) set of manner- or cause-conflated verbs. In verb-framed languages like Korean, on the other hand, path concepts are often encoded together with motion verbs.

In the area of second language acquisition, research demonstrates that there are interlingual influences in the process of encoding motion events; that is, L2 learners tend to transfer their L1 lexicalization patterns to the description of motion events in an L2 (Cadierno 2004, Choi and Kim 2015, Park 2000, Park 2008, Rosalie 2016). The previous studies invariably reported that the learners' first language influences their L2 lexical and grammatical encoding to a substantial degree. Nonetheless, there is still a lack of studies on the processual aspects of language transfer, as the research evidence was exclusively from the output that L2 speakers produce on description tasks. Description tasks inevitably involve individual speakers' varying construals and extraneous variables. They just show the outcome of L2 processing rather than L2 processing itself.

The goal of the present study is to investigate the extent to which the lexicalization patterns of a

language influences the language speakers' implicit processes in the course of planning and producing a sentence. If the language that we speak connects our attention to particular ways of filtering our experiences of the world (Cadierno 2004), and speaking involves picking those characteristics of objects and events that fit some conceptualization of the event and are readily encodable in the language (Slobin 1996), it can be hypothesized that speakers of a satellite-framed language and those of a verb-framed language may use distinct lexical encoding and grouping strategies adapted to their language. Specifically, English speakers may produce a sentence faster when path concepts are presented as independent planning units, while Korean speakers may respond faster when it is paired with a motion verb or a ground reference. One way of testing these predictions is to investigate L1 transfer effects — for example, whether or not Korean L1 speakers' production of L2 English is influenced by their L1 lexicalization patterns. Conceptual elements are encoded by morphosyntactic processes eligible for the language in use. It is likely that L2 learners' initial conceptualization and lexicalization processes are affected by their L1.

In order to see if these hypotheses are on the right track, the current study set out to tap into Korean EFL learners' lexical encoding and grouping when producing sentences describing motion events in two experimental conditions. In one condition, path satellites or prepositions were presented as independent units separated from motion verbs and ground objects, which reflect the morphological properties of English. In the other, they were presented in combination with motion verbs or ground objects, reflecting the morphological properties of Korean. If sentence production draws on individual morphemes, not on lexical items (words), L1 effects will not be significant, as path morphemes are planning units in their own right that may be realized freely regardless of crosslinguistic differences in lexicalization patterns. However, if sentence production uses words as minimal units for planning, that is, if L1 lexicalization patterns do affect L2 processing, it is likely that Korean speakers will use their L1 patterns when producing L2 sentences especially at the initial stage of learning, so they will show a tendency to combine path with motion or ground. In contrast, since the prime semantic elements that constitute a motion event are all morphologically independent in English, English speakers are predicted to use path satellites and prepositions as discrete planning units. As a preliminary attempt, the following questions are addressed here.

- (1) In an online sentence construction task, do English L1 speakers and Korean learners of L2 English react similarly when path satellites are presented separately from motion verbs or ground objects and when they are presented as paired units?
- (2) Is there any significant effect of L1 lexicalization patterns on L2 learners' production of sentences describing motion events? If so, does the L1 effect persist across all proficiency levels or does it change as a function of proficiency?

## 2. Literature Review

### 2.1 Theoretical Background

Talmy (2000b) proposes that a motion event can be conceived as a macro-event consisting of a framing event and co-events. A framing event comprises the internal components: *figure*, *motion*, *path*, and *ground*. Co-events serve to support the framing event and are expressed with external components such as manner and cause. The central and external components were accordingly defined as follows.

- (1) The central semantic components of a motion event

Figure (F): an object that is moving or located

Ground (G): the entity that is related with the figure's path

Path (P): the trajectory followed by the figure with respect to the ground

Motion (M): the fact that expresses the figure's change of its location

- (2) The external components of a motion event

Manner: the way that motion is performed

Cause: the cause that makes the motion originate

The components of the framing event and co-events in English are exemplified in (3) below.

- (3) a. The pencil rolled off the table.

[Figure] [Motion+Manner] [Path] [Ground]

- b. The paper blew off the table.

[Figure] [Motion+Cause] [Path] [Ground]

The core schema of a motion event lies in the path information that conveys a change of location, and it can be expressed by path satellites and/or prepositions. Satellites are usually aligned with their associate motion verbs and can form a verb complex. Prepositions in English are syntactically connected with the ground. The role of prepositions, and equivalents in other languages, does not vary markedly across languages. However, a framing satellite affects not only the aspect of the main event but also the upshot of the whole macro-event. The following examples distinguish satellites and prepositions (Talmy 2000b).

- (5) I blew out the flame.

[Figure] [Motion+Cause] [Path-Satellite] [Ground]

- (6) I stay in the house.

[Figure] [Motion+Manner] [Path-Preposition] [Ground]

In these sentences, ‘I’ refers to Figure, while ‘the flame’ and the house refer to the ground. The verb ‘blew’ and ‘stay’ encode the cause and manner of the Figure’s motion; in other words, ‘blew’ specifies the cause of the figure’s motion. On the other hand, ‘stay’ conflates motion and manner. In case of ‘out’, it is path and it has inherent meaning that is ‘extinction’. Path, ‘out’ contains change of state and It affects the whole meaning of a sentence. Therefore, path, ‘out’ is regarded as satellite. However, path ‘in’ contains continuance of state and it doesn’t influence the whole meaning of a sentence.

Languages are broadly divided into two groups with respect to how the core schema (path) is encoded: satellite-framed languages and verb-framed languages. In satellite-framed languages such as Chinese and English the core schema is usually located in lexicalized satellites while motion verbs incorporate a co-event such as manner and cause. In verb-framed languages (e.g., Romance, Semitic, and Polynesian languages), path tends to be encoded in conjunction with motion verbs, and co-events are expressed separately as subordinate adjuncts or paratactic gerunds. English is a typical satellite-framed language, while Spanish is a verb-framed language. The comparison between English and Spanish is shown in (7) (Talmy 2000b).

(7) Supporting relation: Manner

English: The bottle	float	into	the cave.
	[Motion+Manner]	[Path]	
Spanish: La botella	entró	flotando	a la cueva
	[Figure]	[Motion+Path-Sat]	[Manner] [Path-pre] [Ground]
The bottle	entered	floating	to the cave

On the other hand, in this broad typology, Korean falls into verb-framed languages, although it exhibits a mixed picture. In intransitive clauses for spontaneous motion, manner (e.g., *georeoseo* ‘(by) walking’) and path (e.g., *olla* ‘up’) are optionally encoded with a light deictic verb such as *kata* ‘go’ and *ota* ‘come’, resulting in a serial verb (e.g., *ollakata* ‘go up’).

In (8), *Minsu* denotes the figure of motion, and *gyosil* the ground. *Georeoseo* is a participle indicating the manner of motion, and *tule* is a path satellite. *Gassda* is the verb of motion, and *-ro* is a goal-assigning preposition. The motion verbs, *go* and *come*, contain deictic path information. Manner and other path satellites can be added for more detailed description, but they are adjunctive.

(8) Korean: Minsu-ga gyosil-**ro** georeoseo tule gassda.  
 [Figure] [Ground-Path Prep] [Manner] [Path Sat] [Motion+Deictic Path]

English: Minsu	walked	in(to)	the classroom.
	[figure]	[Manner]	[path-sat] [Ground]

On the other hand, in transitive clauses for caused motion, path is typically conflated into verbs like Spanish. These characteristics of Korean are shown in (9):

- (9) Korean: *Jiwon-i son-eul ollie ssda.*  
 [Agent] [Figure] [Path + Motion]

Here, *Jiwon* is the cause/agent of motion, *son* the figure of motion, and *ollie ssda* the verb incorporating the path of motion. Adjunctive path satellites can be separated from the verb root in spontaneous motion whereas path is compactly conflated with transitive verbs in Korean.

**TABLE 1. Lexicalization of Spontaneous Motion in Intransitive Clauses of Location**

Path	[Path+Motion+Deixis]	[Motion+Deixis]
olla (up)	go up	
naylye (down)	go down	kata (go)
tule (into)	go into	ota (come)
na (out)	go out	
cina (pass)	go pass	
ttala (along)	go along	
tonghay (through)	go through	
kkalocille (across)	go across	
tulle (by)	go by	

**TABLE 2. Lexicalization of Transitive Verbs for Caused Motion in Korean**

	Conflation Pattern: [Path]+[Motion]
ollita (ascend)/ naylita (descend)	Cause something to ascend Cause something to descend
kkita (fit) / ppayta (unfit)	“fit”/“unfit” one three-dimensional object to/from another
Nehta (put) / kkenayta (take)	“put/take multiple objects in/out of a container that one can carry
pwuthita (attach)/ tteyta (remove)	join/ separate a flat surface to/from another flat surface
kkocita (stick in)	put a solid object elongated in one dimension into/onto a base
tamta (include)	put/take multiple objects in/out of a container that one can carry
pwusta (pour)	pour liquid into/ out of a container
kkata (take off)	take off a covering layer or wrapper

Table 3 presents the contrasts between English and Korean in lexicalization patterns for the description of motion events.

**TABLE 3. Comparison of English and Korean Conflation Patterns for Motion Events**

Language	Spontaneous Motion	Caused Motion
English	[Motion+Manner][Path][Ground] [Motion+Cause] [Motion+Deixis]	[Motion+Manner][Path][Ground]
Korean	[Manner][Path][Ground] [Motion+Deixis]	[Manner][Motion+Path+Ground]

Path in English is morphologically separated from the verb root and ground references. This allows motion verbs to incorporate additional semantic elements such as manner and cause. The framing function of path as an independent lexical item is thus central in the domain of syntax, as opposed to morphology. In syntax, path elements are encoded as satellites or prepositions, depending on their phrasal (again, as opposed to lexical) connection with the motion verb or the ground nominal. In (10) below, *Jane* is the figure of spontaneous motion, and *the room* the ground. *Run* conflates motion with its specific manner, *out* a path satellite, which is analyzed as a verb particle, and *of* is the prepositional head that assigns the role of source to the ground.

(10) Jane ran out of the room.

[Figure] [Motion-manner] [Path-satellite] [Path-preposition] [Ground]

On the contrary, the framing function of path in Korean seems to be weaker than in English, at least in the domain of syntax, if not at the level of conceptualization, as path satellites can be omitted optionally in the description of spontaneous motion events and they are lexically incorporated into verbs of caused motion.

Alongside these contrasts between English and Korean, they are also different in the usage of path satellites and prepositions. In English, path satellites are closely connected with motion verbs, and thus they often convey dynamic aspects of motion that are lexicalized into *from*, *to(ward)*, *over*, *across*, *through*, *into*, etc. On the other hand, path prepositions are directly associated with ground references, hence conveying locative/resultative aspects of motion with such items as *at*, *on*, and *in*. This sort of division of labor allows English to have a coordinate system for path descriptions that are applied equally to spontaneous and caused motion events. In Korean, however, path satellites do not constitute a syntactic category. They are morphologically incorporated into deictic verbs in the case of spontaneous motion or verbs of caused motion. Path adpositions, which are also morphological affixes attached to the ground nominal, typically convey the stationary source and goal of motion, *-ey* (at, on, in, to), *-lo* (toward), *-eyse* (from) like *a* (to) and *de* (from) in Spanish. Thus, it can be said that path morphemes in Korean are either encoded in the domain of morphology or encoded syntactically only in the manner of affixation.

As seen above, Korean and English have different lexicalization patterns and morphological dependency. This gives rise to the question of whether their conceptualization and encoding processes are identical or adaptive to such linguistic patterns. In point of fact, research shows that the meanings

of children's early words exhibit language specific patterns (Choi and Bowerman 1991, Choi and Gopnik 1995, Gopnik 1980, Schlesinger 1997). Choi and Bowerman (1991) found that children learning English and Korean showed similar patterns of lexicalization about motion events in the second year of life, but English-speaking children relied heavily on path particles after the second year. Likewise, after the second year, Korean-speaking children were predisposed to concentrate on caused motion. Later they learned a variety of transitive verbs that incorporate path elements and extended them to other classes of motion. These led them to claim that in the course of constructing spatial semantic categories, English and Korean children are guided by the language they are exposed to.

In earlier studies, Bowerman (1978) and Gopnik (1980) focused on single-word utterances that children generate to indicate novel referents, drawing on their nonlinguistic concepts as well as language input. They argue that children's recognition and production of lexical items are an essential stage of language development, reflecting their emerging ability to encode concepts into lexical units. This idea is consistent with Anat's (1985) finding that word production reflects the learner's mental processing by which meanings are formed and itemized by lexicalization. Children's early words are therefore best understood as lexical realizations of complex cognitive (and communicative) acts.

In an effort to identify the relationship between conceptualization and lexicalization patterns, Talmy (2000b) focused on motion events and formulated a typology based on the distinction between the core and peripheral semantic elements that comprise a motion event. By way of showing how these semantic elements are realized differently across languages, he tries to account for the systematic connection that word forms have with cognitive mechanisms for concept formation and integration.

## 2.2 Experimental Research

Although there have been a number of studies inspired by Talmy's analysis of lexicalization patterns for motion events, few were conducted from the perspective of second language acquisition. One relevant study is Cadierno (2004), who investigated how Danish speakers (S-language) express motion events in their L2 Spanish (V-language) as compared to Spanish L1 speakers. In this study, 16 Danish learners of L2 Spanish and 16 Spanish L1 speakers were asked to reconstruct motion events that they saw in a picture book. The Danish speakers were first-year university students, and the Spanish speakers were university students from Spain who visited Denmark for an international exchange program. Cadierno's focus was on the frequency and realization of path and ground components. Narrative data were collected through the medium of *Frog Story*, which contains numerous spatial trajectories. Participants were asked to look at the wordless book in which three main characters, a boy, a dog, and a frog, carry out various movements. The study found that Danish learners of L2 Spanish used significantly more path satellites than Spanish L1 speakers, indicating that L1 transfer occurred at the level of lexical encoding process.

In a similar vein, Park (2008) examined the patterns of morphosyntactic grouping of path and manner components among English and Korean speakers. She observed the performance of Korean L1



speakers in comparison with that of English L1 speakers. Participants were instructed to watch 35 video clips involving motion scenes and describe what they saw in written language. There was a significant difference in the encoding of path and manner information by English and Korean speakers. Korean speakers tended to leave manner information optional while giving attentional focus on path elements. Park's (2008) study does not entirely concur with the predictions drawn from Talmy's original version of linguistic typology. A closer look at Park's data revealed that Korean speakers used *by*-prepositional phrases predominantly. This appears to be related to their preference for encoding causation and agency using *by* + VP. Furthermore, Korean speakers' production of path satellites/prepositions was limited within more or less formulaic language. For instance, Korean learners of English often produced "go in by running" instead of *run in*. The researcher concluded that Korean learners of L2 English did not fully internalize the English verbalization patterns of motion events.

Rosalie (2016) also sought to verify L1 conceptual-morphological transfer into L2 in the expression of motion events. He adopted Slobin's thinking-for-speaking hypothesis to examine the effect of L1 at the levels of conceptualization and lexical encoding in L2. The participants, 27 English learners of L2 Spanish and 32 Spanish learners of L2 English, were asked to perform inverse translation tasks from L1 to L2. The results indicated that English L1 speakers employed the satellite-framed patterns in the production of L2 Spanish 70.4% of the time, while Spanish learners of L2 English exhibited an even higher level of L1 transfer, constructing 75% of their sentences in accord with the verb-framed features of Spanish. Similarly, Choi and Kim (2015) examined how Korean speakers express the manner and path of motion in L2 English. Drawing on the data from an L1-L2 translation task and a preference judgment task, they reported that Korean students tended to use their L1 lexicalization patterns when describing motion events in L2 English. In particular, lower level learners (middle school students) preferred to use path-incorporated verbs (e.g., *enter*) over manner-of-motion verbs (e.g., *float*), while more advanced learners showed a stronger tendency of using the latter. They also found that Korean students frequently used the periphrastic form, *by* V-*ing* (e.g., *by pushing it*), to express a manner of motion, which is marginally acceptable to English L1 speakers. When expressing a change of location, Korean students were predisposed to add extra verbs of motion instead of using prepositional phrases. These findings indicate that L1 lexicalization patterns do influence L2 learners' lexical and structural choice for the description of motion events and that Korean students have considerable difficulty in acquiring the satellite-framed encoding of path concepts. Chung (2019) also investigated Korean students' descriptions of motion events in L2 English. He found that they tended to use manner-of-motion verbs when the given event was expressed in Korean with manner and path elements accompanied by a deictic verb. However, when it was expressed without explicit path elements, they were likely to use a complex verb that conflates path elements, and manner was often expressed in the form of *by* V-*ing*. He concluded that Korean students prefer to adjoin path to deictic verbs where English speakers normally use manner-of-motion verbs.

From a somewhat different perspective, Park (2020) investigated cross-linguistic differences in the description of complex motion events with 15 Korean monolinguals, 80 Korean EFL learners, and 15

English L1 speakers. The participants were presented with short video clips in which a woman, while moving along an explicit path in a certain manner, caused an inanimate entity's change of location. This scene thus contained the path and manner of spontaneous motion and also a caused motion event simultaneously. The study found that English speakers produced manner information more frequently than Korean monolinguals. Korean monolinguals predominantly used path information while leaving manner information unexpressed. These results imply that L1 transfer extends to the description of complex motion events. Another noteworthy finding was that English L1 speakers preferred to encode manner information over the cause of motion. All in all, previous studies have attested that Korean EFL learners are predisposed to use the combination of deictic verbs and path satellites (e.g., *go up*, *come down*) or path-incorporated verbs. Manner information is usually expressed by a participial clause in the form of *by V-ing*.

The present study focuses on how path concepts are encoded and paired with motion verbs or ground references. In English, path morphemes are realized as satellites or prepositions depending on their syntactic nexus with the preceding verb or the following NP, whereas Korean speakers usually express path concepts in conjunction with verbs. If the morphological dependency of path morphemes in Korean plays a role in the speakers' encoding process, they will show a tendency to process them as subordinate elements that are parasitic upon the verb or the ground NP. Instead of analyzing the outcome of lexicalization, this study addresses in what sequences and groups English L1 speakers and Korean EFL learners lexicalize the conceptual elements of a motion event. Previous studies have focused only on the products of lexical and grammatical encoding while disregarding the processes leading to the products. They used image and video stimuli, which often invoked a range of subjective construals that are hard to control. In the experimental task adopted here, the words that refer to conceptual elements comprising a motion event are presented in different orders and groupings, through which the effects of lexicalization patterns and morphological (in-)dependency on the speakers' manner of encoding can be measured and thereby compared.

### 3. Method

#### 3.1 Participants

A total of 73 adult speakers participated in this study: 62 Korean L1 learners of L2 English (34 females, 27 males, ages 20-42) and 11 English L1 speakers (6 females, 5 males, ages 30-45). The Korean participants were college students, and the English participants were English language teachers from the UK, USA, and Canada, who were teaching at a Korean university. Their proficiency in L2 Korean was low. The Korean participants were divided into three L2 proficiency groups: lower-intermediate ( $n = 20$ ), upper-intermediate ( $n = 23$ ), and advanced group ( $n = 17$ ) according to their scores on TOEIC: 500-700, 700-900, and over 900, respectively.

### 3.2 Instrument and Procedure

The primary goal of this study was to identify the existence (or absence) of crosslinguistic differences in the sequence and manner of lexical encoding for a simple motion event. Participants were directed to look at word arrays presented on the screen in various orders and groupings and then produce a complete sentence orally by arranging them in a well-formed way. As seen in Table 4, there were six critical sentences. For example, the sentence, *a boy is going down the hill*, contains four conceptual-syntactic constituents, ‘a boy’ (F), ‘is going’ (V), ‘down’ (P), and ‘the hill’ (G). These were presented in four different ways: [V+P]-F-G, V-F-[P+G], V-P-F-G, V-F-P-G. The presentation sequence of these four conditions was counterbalanced with fillers being inserted between critical items. Eventually, there were 24 critical stimuli. They were composed of six motion verbs (*go, come, move, run, slide, walk*), four path satellites (*up, down, to, on*), five grounds (*hill, stairs, house, school, street*), and three figures (*a boy, a girl, a man*). Five practice items were provided before the initiation of the main experiment. Critical items were presented seemingly irregularly with 26 fillers and nine comprehension questions being distributed randomly. Each word or word group appeared for 0.5 second in sequence.

After the presentation of words, participants had to retain them in their working memory and arrange them into a well-formed sentence. Their oral responses were video-recorded and the time spent completing a sentence was measured. Their response times were compared in each of the four experimental conditions, as seen in Table 4 below. Data were analyzed with the participants’ L2 proficiency level as a moderating variable, in comparison with the performance of English L1 speakers. For statistical analyses, SPSS-22 was used.

**TABLE 4. Analysis Scheme for Critical Items in Four Different Conditions**

	[V+P], F, G	V, F, [P+G]	V, P, F, G	V, F, P, G
A boy is going down the hill.				
A man is coming up the stairs.				
A man is moving to the house.				
A girl is running to the school.				
A boy is sliding on the hill.				
A girl is walking on the street.				

### 3.3 Task Design

The foundational assumption of this study is that linguistic encoding of motion events is based on four conceptual elements: figure, ground, motion, and path. As a matter of fact, there exist several types of motion that can be conceptualized and hence linguistically expressed, and they are intricately connected with one another. In this preliminary attempt, we focused on spontaneous motions (e.g., *I go to school*), using words and word groups instead of images or video clips, because the latter led the participants to produce so wide a range of construals and expressions that could not in effect be

analyzed objectively. Since one goal of this research was to see potential L1 effects on L2 production, the stimuli were constructed out of the most basic words that Korean participants learned at the earliest period of L2 learning, which were extracted from the General Service List. They explicitly and unambiguously corresponded to each motion-related conceptual category. In the end, 13 words were selected for each category (e.g., *boy, man, girl, move, run, slide, up, down, to*), and it was ascertained that both L1 and L2 speakers had no difficulty making a sentence with them.

As for motion verbs, 6 intransitive verbs (*go, come, move, run, slide, walk*) were used for critical stimuli. The words that represented a figure of motion were 3 animate agents: *boy, girl, and man*. This was to take into consideration the fact that Korean speakers are less familiar with inanimate agents. Among path satellites and prepositions, 4 most frequent ones (i.e., *up, down, to, and on*) were used. These words were all compatible with the selected motion verbs. Similarly, for the words denoting a ground, 5 most frequently occurring words were selected: *hill, stairs, house, school, and street*. The size of each word occupied approximately one third of the whole image presented against a green background, using computer screen.

As mentioned above, verb-framed languages conflate path elements into a motion verb, whereas path and motion are encoded separately in satellite-framed languages. At least two hypotheses can be drawn out of these facts. One is that Korean speakers will produce a sentence more quickly when the words are presented in the same order and manner as their mental process of lexical encoding; that is, when path elements are presented together with motion verbs as one paired unit. English speakers, on the other hand, will produce a sentence more quickly when motion and path information are presented apart. In other words, they would prefer to encode a sentence on a word-by-word basis if their 'thinking-for-speaking' is shaped by the lexicalization patterns of English.

Another concomitant prediction is that Korean speakers will produce a sentence more quickly when path morphemes are combined with verbs and ground objects (more precisely, referring expressions for the ground), which reflect the morphological dependency of Korean. On the other hand, path prepositions are encoded separately from the ground like satellite.

In order to test these predictions, an experiment was designed in which participants were presented with a series of words or word groups in various sequences and asked to produce a complete sentence using them. Four critical conditions were constructed by way of alternating two variables, presentation sequence and lexical grouping: V-P-F-G, V-F-P-G, [V+P]-F-G, and V-F-[P+G]. In critical items, motion verbs (V) were presented first and ground references (G) were presented last, preceded either by figure (F) or path (P) references. These sequences were assumed to neutralize the effect of surface word order of English and Korean, allowing for a controlled comparison focusing on where (either with V or with G) and how (either in isolation or in pairs) path is situated.

Consequently, each item contained a set of words (and word groups) constituting a sentence, and they appeared on the screen for 0.5 second one after another in different sequences and groupings. There were 50 items in total: 24 were critical items and 26 were fillers to keep participants from making a prediction about critical items. In addition, to prevent their inattentive, careless performance,

simple comprehension questions were sporadically included, asking about the meaning of the immediately preceding stimulus. Since these questions just purported to maintain participants' attention to the experiment, they were not scored for analysis.

#### **4. Results and Discussion**

Focusing on the realizations of path concepts in the description of motion events, this study addresses whether, and to what extent, the differences in lexicalization patterns and morphological dependency between English and Korean affect the speakers' implicit processes involved in sentence production. Path concepts are usually incorporated into motion verbs in verb-famed languages, while they are encoded separately into satellites or prepositions in satellite-famed languages. The division between satellites and prepositions is made in the domain of syntax. In the tradition of descriptive and pedagogic grammar, path satellites are often treated as adverbial particles modifying the verb head while prepositions project their own phrases. Importantly, though, they are both morphologically independent rather than affixal, regardless of their syntactic status. If a sentence is planned on the basis of phrasal units, not of lexical items, it can be predicted that speakers will produce sentences with facility when path satellites are presented in conjunction with a verb while prepositions are presented with a ground. However, if a sentence is built up on the basis of lexical items, both satellites and prepositions are conceptualized individually and lexicalized as such, so that there will not be any significant difference caused by their conjunction (or disjunction) with other constituents.

To put it in another way, insofar as morphological features are concerned, prepositions in English are independent from the ground, whereas postpositions in Korean are attached to the ground as dependent morphemes. These contrasts in morphological dependency may have something to do with the speakers' psychological processing for sentence production. Path satellites in English are morphologically independent from the verb, although they are syntactically, and thus compositionally, connected with the verb. This morphological independence is also found in path prepositions as they are encoded independently from the ground. In Korean, path satellites are morphologically incorporated into a motion verb and path postpositions are affixed to the ground as dependent morphemes. If these morphological characteristics play a role in the process of lexical encoding and syntactic phrasing, it can be hypothesized that English speakers tend to construct sentences on a word-by-word basis, while Korean speakers prefer to use multi-morphemic units that group path and motion or path and ground.

As discussed earlier in detail, participants were presented with word sequences that reflect these lexicalization patterns: V-P-S-G, [V+P]-S-G, V-S-P-G and V-S-[P+G]. First, [V+P]-S-G and V-P-S-G sequences were compared to observe the planning and encoding of path satellites, specifically, the effect of the interlingual morphological differences in question on the production of path satellites between English and Korean. The comparison was an attempt to determine whether Korean learners of L2 English respond to the stimuli based on individual words (i.e., independent morphemes) or on

motion-path conflated word groups (i.e., [V+P] pairs). Similarly, the comparison between V-S-P-G and V-S-[P+G] arrays was made for the purpose of assessing the effect of the interlingual differences on path encoding in association with ground references.

A one-way ANOVA was conducted to see if L2 proficiency level brought about any significant difference, and then post-hoc tests followed to compare the five speaker groups in each experimental condition.

#### 4.1 V and P as Paired or Discrete Units

Table 5 shows the participants' mean response times in two experimental conditions: V-then-P in isolation versus [V+P] in pairs.

**TABLE 5. Descriptive Statistics of Participants' Response Time**

	Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>
[V+P], S, G	Advanced	17	1.791	.281	10.137	0.02
	Upper-intermediate	23	2.014	.501		
	Lower-intermediate	20	1.952	.483		
	English L1 speakers	11	1.698	.213		
	Total	71	1.894	.425		
V, P, S, G	Advanced	17	1.625	.219		
	Upper-intermediate	23	1.789	.324		
	Lower-intermediate	20	2.015	.509		
	English L1 speakers	11	1.537	.156		
	Total	71	1.775	.386		

The output of descriptive statistics for spent time is shown with respect to each proficiency group. There was a significant difference between Korean EFL learners and English L1 speakers ( $p = .02$ ).

Clearly, English speakers responded faster when words were presented individually than when V and P were presented as a paired unit. This tendency was also observed among advanced and upper-intermediate learners; they were more likely to complete sentences faster in the V-P-S-G condition than in the [V+P]-S-G condition. However, the lower-intermediate group spent more time when V and P were presented separately.

These results suggest that English speakers' lexical encoding for motion verbs and path satellites are based on individual words rather than phrasal units. With the increase of proficiency, L2 learners seemed to have acquired the discrete word-based encoding. L1 transfer effects were only observed in the lower intermediate group who responded considerably faster in the [V+P]-S-G condition, maintaining L1 lexicalization and morphological operations in L2 production. Table 6 shows the paired comparisons between groups.

**TABLE 6. Paired Comparisons**

Group	Mean Difference	Std. Error	<i>p</i>	95% LSD	
				Lower	Upper
KA — KL	-.276	.116	.021	-.508	-.043
KU — ES	.284	.129	.031	.026	.542
KL — ES	.367	.132	.007	.103	.631
ES — KU	-.284	.129	.031	-.542	-.026

KA: Korean advanced learners of English, KU: Korean upper-intermediate learners of English

KL: Korean lower-intermediate learners of English, ES: English native speakers

These pairwise comparisons verified that there was a significant difference between English L1 speakers and Korean lower-intermediate learners. It can thus be said that L2 learners are influenced by their L1 lexicalization and morphology patterns at early stages of development, while they are capable of switching to L2 patterns as a function of proficiency. It is also worth noting that the separation of motion and path concepts into two independent lexical items causes L2 learners to experience difficulty in learning. This finding is consistent with Cadierno’s (2004) in that L2 learners whose L1 is a satellite-framed language show a strong tendency to use path-encoding morphemes more frequently than path-motion conflated verbs.

**4.2 P and G as Paired or Discrete Units**

Table 7 shows the participants’ mean response times in the [P+G] and P-G conditions by proficiency group. As mentioned before, the comparison of [P+G] and P-G was made to investigate the effect of morphological dependency of path morphemes on the process of encoding and producing a sentence in Korean and English.

**TABLE 7. Response Times in the [P+G] and P-G Conditions**

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>P</i>
V, S, [P+G]	Advanced	17	1.677	.180	
	Upper-intermediate	23	1.819	.351	
	Lower-intermediate	20	1.890	.381	
	English L1 speakers	11	1.587	.195	
	Total	71	1.769	.321	3.941
V, S, P, G	Advanced	17	1.651	.202	
	Upper-intermediate	23	1.722	.322	
	Lower-intermediate	20	1.932	.400	
	English L1 speakers	11	1.460	.238	
	Total	71	1.723	.344	

English speakers responded more quickly when P and G were presented as discrete units than when they were combined into one phrasal unit, [P+G]. This tendency suggests that as path satellites and prepositions are morphological independent in English, they are conceptualized and encoded as discrete

units at the initial stage of sentence production. L1 transfer was only observed among lower-intermediate learners. The advanced and upper-intermediate groups showed a response pattern similar to that of English L1 speakers; they were faster when P and G were presented individually than when they were paired. It seems that the lexicalization patterns and morphological properties of English induce its speakers to plan and produce a sentence on a word-by-word basis, which applies not only to path satellites (syntactic particles) but to prepositions (syntactic heads).

The lower-intermediate group manifested a substantial degree of L1 transfer; Their response time was shorter in the [V+G] condition in which path and ground information were conflated into one encoding unit. Again, as L2 learners' proficiency improves, their manner of lexical encoding is likely to approach that of English L1 speakers. Table 8 presents the results of the post-hoc tests.

**TABLE 8. Paired Comparisons**

Group	Mean difference	Std. Error	Sig.	95% LSD	
				Lower	Upper
KA — KL	-.247	.096	.013	-.439	-.055
KU — ES	.247	.107	.024	.034	.461
KU — KA	.247	.096	.013	.055	.439
KL — ES	-.387	.110	.001	-.169	.606
ES — KU	-.247	.107	.024	-.461	-.033
ES — KL	-.387	.110	.001	-.606	-.169
KU — ES	.247	.107	.144	-.044	.581

There was a significant difference between English L1 speakers and Korean lower-intermediate learners. The lower-intermediate group apparently had greater difficulty when path and ground were presented individually than when they were combined into one planning unit, suggesting that their processing is based on L1 patterns, unlike more advanced learners. Thus, it can be said that L1 lexicalization patterns and morphological properties do influence L2 processing at early stages of L2 development and that such L1 influence diminishes as learner proficiency advances.

Another noteworthy finding is that English L1 speakers' response time was faster when path information was presented together with or near ground references than when it was presented with/near motion verbs. The same tendency was observed with L2 learners at upper- and lower-intermediate levels. In the case of advanced learners, however, there was no considerable difference between [V+P]/V-P and [P+G]/P-G. This inconsistency calls for further research concerning the delicate sequential aspects of conceptualization and subsequent lexical encoding and grouping.

A tentative conclusion drawn from the findings above is that path concepts — and hence the morphemes encoding them — are primarily associated with the ground, and motion verbs are encoded independently of path in English. The direct relationship between path and ground, and the secondary relationship between motion and the pairing of path and ground seem to be acquired earlier than their morphological realizations.



## 5. Conclusion

This study attempted to link a particular aspect of L1-L2 linguistic difference with L2 speakers' implicit processing for sentence production. The fragment of concern was spontaneous motion events; in particular, in what sequences or groupings their conceptual components are encoded. According to Talmy's (2000b) typology, Korean is a verb-framed language where path morphemes are typically realized as dependent morphemes conflated into motion verbs or affixed to ground references. In contrast, English is a satellite-framed language in which path concepts are realized as independent morphemes and function independently of verbs or grounds.

When describing a motion through language, path is the framing information that configures the whole meaning and structure of the clause. Verb-framed languages use the strategy of incorporating path into motion verbs, influencing the entire procedure of lexical and grammatical encoding of motion events. Whether these typological differences in lexicalization patterns and morphological properties have something to do with the language speakers' encoding processes has not been empirically attested in previous studies.

The findings of this study indicate that English speakers' production of a sentence describing a motion event is based on independent morphemes rather than on their combinations. Their responses were faster when relevant morphemes were given as discrete planning units than when they were presented in groups. For Korean learners of L2 English, however, encoding path information separately from motion or ground caused increased difficulty, if their proficiency has not sufficiently developed. As evidenced by the performance of upper-intermediate and advanced learners, this tendency is likely to disappear in the course of L2 development. It can therefore be said that L1 transfer does occur in L2 lexical encoding but its effect diminishes as a function of L2 proficiency. For English L1 speakers and advanced L2 learners, there was only a marginal difference in response time, whether path is aligned with motion verbs or with ground references. However, L2 learners at lower proficiency levels manifested a larger difference between the two conditions; they tended to respond more quickly when path was aligned with a ground reference than with a motion verb. This implies that path satellites as independent morphemes are the most problematic area of learning that requires a switch at processing level. Path prepositions are relatively less problematic to Korean learners of English.

To conclude, this study investigated the sequence and manner of lexical encoding for sentences describing motion events with speakers of two typologically different languages, English and Korean. The findings support that English speakers tend to base their lexical encoding on independent morphemes, with path satellites and prepositions as discrete planning units. L2 learners whose L1 is morphologically agglutinative are able to acquire the analytic lexicalization patterns as their proficiency increases. L1 transfer effects are observed only before their proficiency develops enough to adjust their selection and arrangement of lexis to L2 patterns.

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Examples in: English

Applicable Languages: English

Applicable Level: All