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How do speakers of different languages differ in the encoding of complex motion events?*

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Park, Hae In. 2020. How do speakers of different languages differ in the encoding of complex motion events? *Linguistic Research* 37(1), 95-120. Languages vary considerably in how they encode motion. Research (Slobin 2004; Talmy 1985, 2000) has shown that inter-typological differences are found in the frequency of encoding (high vs. low) as well as in the locus of encoding (main verb vs. satellite). Based on these typological differences, cross-linguistic influence (CLI) research has sought to examine the impact of language typology on the processes and outcomes of second language (L2) learning. While research in this area has been fruitful in the past decade, the majority of studies (Cadierno and Ruiz 2006; Daller, Treffers-Daller, and Furman 2011; Park 2019) have centered on investigating the encoding of path and manner of spontaneous motion events. To expand our understanding of how different components of a motion event get selected and sequenced for verbalization, the current study compared encoding patterns of complex motion events by three different language groups (Korean speakers, *n*=15, English speakers, *n*=15, Korean learners of English, *n*=80). Complex motion events comprised three components of motion (i.e., path, manner, and cause), and participants' descriptions were elicited using a video description task. The results indicated that monolingual speakers exhibited both universal and language-specific encoding patterns, and that English as a Foreign Language (EFL) learners' motion event descriptions in the L2 displayed L1-based patterns as well as unique characteristics that are specific to EFL learners. In addition, EFL learners' English-like encoding patterns of complex motion events were largely predicted by L2 productive vocabulary scores. **(University at Albany, SUNY)**

Keywords complex motion events, motion event encoding, path, manner, and cause encoding, cross-linguistic influence

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1. Introduction

While humans share basic concepts of space and motion, languages vary in how they classify and express motion (Berman and Slobin 1994; Choi and Bowerman 1991; Slobin 1996). According to Talmy (1985: 60), a motion event refers to "a situation containing movement of an entity or maintenance of an entity at a stationary location", and it consists of four central components: Motion (presence of motion), Figure (a moving object), Ground (a reference object in relation to which the figure moves, which can be a goal or a source), and Path (a trajectory of motion occupied by the figure). In addition, a motion event may also include external co-events such as Manner (the manner in which the figure moves) and Cause (the agent causing the figure to move) that provide additional semantic information about the movement. While these components of motion are available to all viewers, languages vary in the way they select and organize them for motion event descriptions. In Talmy's (1985, 2000) typology, languages that typically encode manner in the main verb and path in a satellite are called satellite-framed languages (S-languages), and those that tend to express path in the main verb and often omit manner information in verbal production (unless it is particularly salient in a scene) are called verb-framed languages (V-languages). There is now ample empirical evidence demonstrating that speakers of Germanic languages such as English and German exhibit characteristics of S-languages, while speakers of Romance languages such as Spanish and Portuguese, as well as Japanese and Korean, display patterns of V-languages (e.g., Cadierno and Ruiz 2006; Choi 2009; Choi and Bowerman 1991; Daller, Treffers-Daller, and Furman 2011).

Using these cross-linguistic studies as a point of departure, second language acquisition (SLA) researchers have been active in examining motion event encoding patterns in second language (L2) learners. Their primary focus lies in finding out to what extent L2 learners are able to restructure their first language (L1) encoding patterns to describe motion events in an L2 that is typologically different from their L1. SLA research dealing with spontaneous motion events (i.e., motion events in which an entity spontaneously moves across space without an external cause) has shown that verbal encoding patterns established in an L1 are resistant to restructuring (Cadierno 2010; Daller et al. 2011; Larrañaga,

Treffers-Daller, Tidball, and Ortega 2011). Although a handful of studies have provided evidence for L2 learners' partial convergence to the target-like encoding patterns (e.g., Cadierno and Ruiz 2006; Park 2019; Treffers-Daller and Calude 2015), research to date seems to suggest that complete acquisition of L2 encoding patterns are generally challenging even for advanced L2 learners.

Despite the fact that motion event research in the fields of first language acquisition and SLA has witnessed substantial growth over the past few decades, its scope has been largely limited to investigating descriptions of spontaneous motion events, which depict an entity moving along a trajectory in a certain manner. While we have gained a considerable understanding of how typologically different languages encode path and manner of motion in this context, less is known about whether speakers exhibit similar encoding patterns when they describe motion scenes that include additional elements of motion. That is, when multiple elements of motion, such as path, manner, and cause, are depicted in the same scene, how would speakers of different languages select and package information for verbalization? Investigating such an inquiry would help us extend our understanding of motion encoding in new ways.

In an effort to advance motion event research, the present study investigated how speakers of different languages refer to complex motion event scenes that depict an entity's spontaneous motion together with caused motion. Motion event descriptions produced by speakers of two typologically different languages, Korean and English, were first examined and then motion event descriptions of Korean English as a Foreign Language (EFL) learners were compared against the two monolingual counterparts. The focus of study was specifically directed at examining the frequency and locus of encoding for path and manner of spontaneous motion as well as for caused motion.

2. Motion expressions in Korean and English

Motion event research has flourished over the last few decades, and there is now substantial evidence that shows that languages systematically differ in the way they encode path and manner of motion events. According to Talmy's (1985, 2000) typology, languages that encode path in the main verb and manner

in a satellite are called V-languages, while languages with the opposite encoding pattern (i.e., manner in the main verb and path in a satellite) are called S-languages. In S-languages, both path and manner information can be compactly packaged into the same clause as shown in (1a). On the contrary, V-languages typically require an additional periphrastic construction (e.g., a subordinate clause or a serial verb) to express manner information as in (1b), and therefore, manner information is often omitted due to its low codability. For this reason, Slobin's (2004) cline of manner salience considers S-languages to be high-manner salient and V-languages to be low-manner salient.

(1) a. The woman is walking$_{[manner]}$ into$_{[path]}$ the classroom.

b. 여자가 교실에 걸어$_{[manner]}$ 들어$_{[path]}$간다.

yeca-ka kyosil-ey kel-e tul-e-ka-n-ta

The woman-NM classroom-AC walk-CN enter-CN-go-PRS-DC[1]

'The woman entered the classroom, walking'

Slobin (2006) has presented Korean and English as examples of languages whose motion event descriptions respond to different typologies, and empirical studies (Choi 2009, 2011; Choi and Bowerman 1991; Park 2019) have demonstrated that Korean and English speakers in effect conflate path and manner in differential ways to describe spontaneous motion events. As a head-final language, Korean places the main verb of a clause in the rightmost constituent, which carries all the inflectional suffixes. A path or manner verb is often strung together with a deitic verb such as *kata* 'go' or *ota* 'come' as in *tul-e kata* 'enter-go' or *kel-e kata* 'walk-go.' These 'path + deictic' verb compounds and 'manner + deictic' verb compounds are generally regarded as path and manner compound verbs, respectively, as they get a separate entry in a dictionary (Lee 1999; Oh 2003). When both path and manner compound verbs are equally at speakers' disposal, previous studies on L1 acquisition (Choi 2009, 2011) have shown that Korean speakers predominantly preferred to use path compound verbs than manner compound verbs. Manner information was often omitted, but

1 The Yale Romanization system is followed in transcribing Korean examples. Abbreviations for glosses are: AC (accusative case particle); CN (connector); DC (declarative sentence-type suffix); NM (nominative case particle); PRS (present tense suffix).

when expressed, it was relegated to a secondary position in the clause (e.g., in the pre-final verb position in a serial verb construction or in an adverbial clause). In contrast, English speakers preferred to encode manner compound verbs and encode path in a satellite, displaying salient characteristics of S-language speakers.

Based on the aforementioned L1 studies, Park (2019) has examined Korean-English speakers' L2 descriptions of spontaneous motion events. The results demonstrated that their motion expressions included both L1-based and L2-based encoding patterns, not to mention learner-specific encoding patterns that could not be traced back to their L1 or L2 patterns. Among many language-related factors, L2 proficiency emerged as the strong predictor of the development of L2 motion encoding patterns. This result is in line with Cadierno and Ruiz (2006) and Treffers-Daller and Calude (2015) that suggest that L2 encoding patterns are likely to become more target-like with the increase of L2 proficiency.

While we know a great deal about how speakers of different languages, including both L1 and L2 speakers, express spontaneous motion events, less is known about how speakers describe motion event scenes that include elements other than just path and manner of spontaneous motion. More recently, there has been some effort and interest in exploring varied motion event scenes including caused motion events (e.g., Choi 2009; Ji and Hohenstein 2014; Ji, Hendriks, and Hickmann 2011; Kwon 2016). Caused motion involves an action in which an agent causes an object to change its state or move its location. Choi (2009), in particular, examined the extent to which causation is highlighted in descriptions of various motion event scenes. Two scenes depicted spontaneous and caused motions co-occurring in a single event (e.g., John is kicking a ball and running toward Mary at the same time), and Choi (2009) investigated which motion type (spontaneous vs. caused motion) gets foregrounded in the main clause. The results demonstrated that English speakers preferred to encode caused motion in the main clause while V-languages speakers, including Korean speakers, showed a tendency to express spontaneous motion in the main clause. This small-scale investigation suggests that there may be typological differences in how speakers of different languages describe motion event scenes other than spontaneous motion events, and that more research is warranted to examine

more varied motion event scenes.

3. Research questions

To contribute to a fuller understanding of motion event encoding, the present study extended Choi (2009) by investigating how speakers of different languages describe motion events in which spontaneous and caused motions co-occur. These motion events will be referred to as complex motion events since they are complex in the sense that a figure engages in two different types of motion: self-agentive motion that eventually results in a change of location (e.g., The woman walks down the stairs) and caused motion, in which a figure exerts force to an inanimate entity to bring about a change of state or location for a recipient (e.g., The woman kicks the box). Each complex motion event included four central elements of a motion event (i.e., Motion, Figure, Ground, and Path) as well as Manner (Manner of spontaneous motion and Manner of caused motion) and Cause.

The goal of the study was two-fold: (1) to compare how speakers of two typologically different languages, Korean and English, select and structure information regarding complex motion events in their respective L1s; and (2) to examine whether L1-based encoding patterns tend to carry over into EFL learners' motion event descriptions in the L2. The three research questions motivating the present study are as follows:

RQ1. How do Korean and English monolingual speakers select and structure information about complex motion events in their respective L1s?
RQ2. How do Korean EFL learners select and structure information about complex motion events in their L2 English?
RQ3. What are some language-related factors that may influence Korean EFL learners' encoding patterns?

4. Method

4.1 Participants

A total of 110 participants participated in the present study (70 females and 40 males), and they were categorized into one of the three groups based on their language backgrounds: the Korean monolingual (KM) group, the English monolingual (EM) group, and the EFL group. Participants in the present study were the same participants as in Park (2019), allowing a direct comparison between the two studies possible. Korean monolingual speakers (*n*=15) had minimum exposure to foreign languages they had once learned and primarily used Korean on a daily basis. Although the Korean speakers all reported having learned English as part of their formal education, their English language competence was kept to minimum as evidenced by their English proficiency assessed via a direct measure (see Table 1). Similarly, it was ensured that English monolingual speakers displayed minimum use of foreign languages in their daily lives and had no high proficiency in V-languages (e.g., Spanish, French, Korean). This was an important criterion for monolingual participant selection as advanced knowledge of typologically distant languages (e.g., V-languages for S-language speakers) could potentially warp their motion encoding patterns shaped by their L1 English. Lastly, the EFL group (*n*=80) consisted of Korean learners of English who represented a wide range of English proficiency levels. Although there were eight EFL learners with a very early age of onset (before the age of five), most of them were Korean-dominant speakers who started learning English in a foreign language context. None reported any advanced knowledge in other foreign languages besides English. While participants in the KM and EFL groups were recruited from universities and churches in Korea, participants in the EM group was recruited from universities in the United States. Table 1 summarizes the language backgrounds of the three language groups.

Table 1. Summary of language backgrounds for three language groups

	KM (*n*=15)		EFL (*n*=80)		EM (*n*=15)	
	M (SD)	Min-Max	*M (SD)*	Min-Max	*M (SD)*	Min-Max

Age	27.60 (7.30)	19-43	22.71 (2.68)	18-31	21.67 (4.82)	18-35
AO	13.27 (6.20)	8-34	8.45 (2.36)	1-14	—	—
English EIT	28.60 (10.94)	13-48	77.96 (15.20)	48-106	—	—
L2 use	.23 (.56)	0-2	1.54 (1.70)	0-10	—	—
Length of study	101.67 (37.68)	72-168	156.45 (40.03)	60-276	—	—
Length of immersion	0	0	10.43 (24.73)	0-132	—	—

Note. *M* = mean; *SD* = standard deviation; Age = age at the time of testing; AO = age of onset for English; EIT = Elicited imitation test; L2 use = hours of current usage of L2 per day; length of study = the number of months spent to study English; length of immersion = the number of months spent in an L2-speaking country; — = not applicable.

4.2. Video description task

A video description task was developed to elicit participants' verbal descriptions of complex motion events. Each video clip depicted a woman moving along an explicit trajectory in a certain manner while causing a change of state or location to an inanimate entity. Thus, the stimuli were created to present path and manner of spontaneous motion and caused motion equally salient and simultaneously occurring. Each scene lasted approximately 7 seconds.

Twenty stimuli scenes were created using five path types (i.e., across, down, into, out of, up), two manner types (i.e., run, walk), and four caused motion types (i.e., blow, kick, rip, throw).[2] Table 2 lists 20 scenes along with the information about the cause, path, and manner involved in each scene.

Table 2. Complex motion scenes used in the video description task

No	Scene	Path	Manner	Cause
1	Woman (W) walks across street kicking box	across	walk	kick
2	W walks across street ripping paper	across	walk	rip
3	W walks down stairs blowing whistle	down	walk	blow
4	W walks down stairs throwing pens	down	walk	throw
5	W walks into room blowing whistle	into	walk	blow
6	W walks into room kicking box	into	walk	kick

2 It is worth noting that what actually distinguishes these caused motion types from each other is manner of the action causing the change of state or location.

7	W walks out of room kicking box	out of	walk	kick
8	W walks out of room throwing pens	out of	walk	throw
9	W walks up stairs blowing whistle	up	walk	blow
10	W walks down stairs ripping paper	down	walk	rip
11	W runs across street throwing pens	across	run	throw
12	W runs across street kicking box	across	run	kick
13	W runs down stairs ripping paper	down	run	rip
14	W runs down stairs throwing pens	down	run	throw
15	W runs into room kicking box	into	run	kick
16	W runs into room throwing pens	into	run	throw
17	W runs out of room kicking box	out of	run	kick
18	W runs out of room throwing pens	out of	run	throw
19	W runs out of room blowing whistle	out of	run	blow
20	W runs up stairs throwing pens	up	run	throw

After watching each video clip, participants described what was happening in each scene in their L1 (for monolingual speakers) or L2 (for EFL learners). The instruction was given to the two Korean groups in Korean (i.e., "비디오 속에서 일어나는 일을 설명하시오") and to the EM group in English (i.e., "Describe what is happening in each video"). All responses were audio-recorded, transcribed by a native speaker of the respective language, and coded and scored in three steps following the coding guidelines in Table 3.

Table 3. Coding guidelines for the video description task

Coding steps	Scoring method	Possible score
Frequency of path, manner, and cause	One point was awarded for a lexicalized path, manner, or cause expression in each item and the total number of points was tallied to obtain the frequency of path, manner, and cause for each participant.	20
Choice of verb types	The main verb used in each response was classified as a path, manner, cause, generic motion, or non-motion verb.	20

4.3. Background information questionnaire

An online background information questionnaire was developed and

administered to all participants via the Qualtrics survey software (https://www.qualtrics.com) to garner information about the following background factors: age at the time of testing, age of onset for English, length of English study, L2 use, length of immersion in an L2-speaking country, knowledge of other foreign languages. Participants' background information is summarized in Table 1.

4.4. L2 proficiency measures

Global (oral) English proficiency was measured with an elicited imitation test (EIT), which estimated participants' ability to repeat oral sentences. An English EIT developed by Ortega, Iwashita, Norrris, and Rabie (2002) was administered to all Korean speakers. The EIT consisted of 30 English sentences, and participants were asked to listen to one sentence at a time and to repeat it as accurately as possible. Their responses were scored using the 5-point rubric developed by Ortega et al. (2002), and a total possible score was 120.

Additionally, EFL learners' vocabulary capacity was measured via four tests of receptive and productive vocabulary size: two tapping into general English vocabulary, and two tapping into specific knowledge of motion verbs. Table 4 shows the test sources and design information.

Table 4. Vocabulary test type

Test type	Measuring construct	Item type	Source	Possible score
General receptive vocabulary test	receptive vocabulary knowledge	70 multiple-choice items	Vocabulary Size Test (Nation and Beglar, 2007)	70
General productive vocabulary test	productive vocabulary knowledge	50 cloze items	Vocabulary Levels Test (Laufer and Nation, 1999)	90
Motion-specific recognition vocabulary test	receptive motion-specific vocabulary knowledge	100 yes/no items	100 most frequent motion verbs from Férez (2008)	100

Motion-specific productive vocabulary test	productive motion-specific vocabulary knowledge	Students are asked to write as many English motion verbs as possible in 5 minutes	Cadierno (2010)	No predetermined possible score

4.5. Procedure

Each participant completed the online background questionnaire at home and then met individually with a researcher to complete a series of tasks in the following order: the English EIT, the video description task, the vocabulary tests. The EIT was administered to the KM and EFL groups, and the vocabulary tests were administered only to the EFL learner group. As this study was part of a larger project, participants also took part in three additional tasks:[3] a non-verbal task, a narrative task, and a non-verbal memory task.

5. Results

5.1. Frequency of path, manner, and cause encoding

To examine the likelihood of path, manner, and cause encoding in participants' complex motion event descriptions, the number of any lexical items referring to path, manner, or cause was tallied (see Coding Step 1 in Table 3). Table 5 presents these frequency results, and the same information is graphically represented in Figure 1. It is worth mentioning that non-target-like use of path particles was observed in the EFL learner data, for instance, using the verb 'cross' instead of the preposition 'across' to refer to the spontaneous motion of a woman walking *across* the street. This affected a total of 2.55% of cases. However, full credit was awarded in these cases because even a non-target-like

3 A non-verbal task employed was a triads-matching task that was intended to examine participants' similarity judgment of motion events. The results are reported in Park (2019). A narrative task asked participants to describe the wordless picture book "Frog, Where Are You?" (Mayer, 1969), and an object orientation memory task adapted from Fausey, Long, Inamori, and Boroditsky (2010) served as a measure of memory performance.

attempt to express path reflected a participant's intention to encode path in his/her motion event description. Thus, all the statistical analyses reported in this section were conducted with the frequency value of the EFL group that included in the count non-target-like use of path expressions.[4]

Table 5. Descriptive statistics for the frequency of path, manner, and cause encoding

	Path encoding		Manner encoding		Cause encoding	
	M (*SD*)	%	*M* (*SD*)	%	*M* (*SD*)	%
KM	18.40 (1.40)	92%	7.87 (3.58)	39.35%	19.67 (1.29)	98.35%
EFL	15.75 (3.77)	78.75%	8.35 (4.87)	41.75%	19.58 (1.16)	97.9%
EM	19.67 (1.25)	98.35%	17.47 (2.56)	87.35%	20.00 (0)	100%

Note: *n* for KM and EM = 15; *n* for EFL = 80; maximum score = 20.

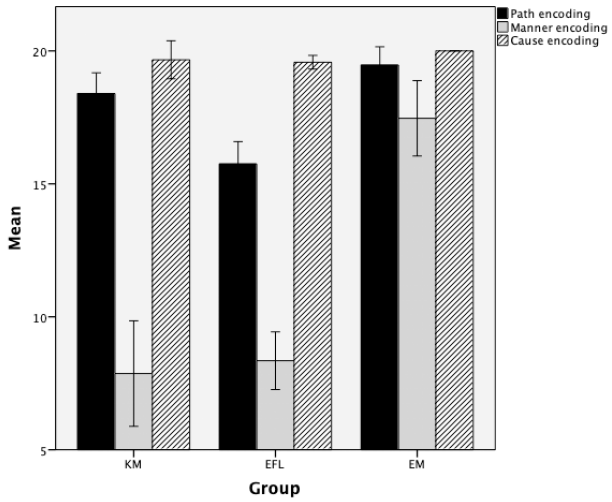

Figure 1. Frequency of path, manner, and cause encoding by language group

To investigate whether there were any statistically significant differences in the frequency of path, manner, and cause encoding across the language groups, a one-way between-groups multivariate analysis of variance (MANOVA) was

4 When all analyses were conducted with the EFL learners' error-free frequency value, no statistically meaningful change was observed in the results.

performed, with three dependent variables (frequency of path encoding, frequency of manner encoding, and frequency of cause encoding) and one independent variable (language group). Using Pillai's Trace, the results demonstrated that there was a statistically significant difference among the three language groups on the combined dependent variables, V = .29, $F(6, 212)$ = 9.12, p < .001, partial η^2 = .22. Separate ANOVAs on the outcome variables indicated that there were statistically significant group differences in the frequency of path encoding, $F(2, 107)$ = 10.46, p < .001, partial η^2 = .16, as well as in the frequency of manner encoding, $F(2, 107)$ = 27.37, p < .001, partial η^2 = .34, but not in the frequency of cause encoding, $F(2, 107)$ = .95, p = .390, η^2 = .02. Accordingly, post-hoc analyses were conducted with the two statistically significant dependent variables using a Bonferroni adjusted alpha level of .017. For the frequency of path encoding, the EFL group was significantly lower than that of the two monolingual groups (p < .05 for both comparisons), with large effect sizes: KM-EFL, d = .93; EM-EFL, d = -1.40. No reliable differences were found between the two monolingual groups. For the frequency of manner encoding, the EM group was statistically significantly higher from both the KM and EFL group (p < .001 for both comparisons), yielding large effect sizes: EM-KM, d = -3.08; EM-EFL, d = -2.34. On the other hand, the KM and EFL groups encoded manner to a similar extent, yielding no reliable group differences. Overall, the EFL group expressed path in their L2 English less frequently than the two monolingual groups, and the EM group expressed manner information significantly more frequently than both KM and EFL groups.

5.2. Choice of verb type

To identify which motion element gets expressed through the main verb in the main clause, the choice of verb types by the three language groups was compared across five categories: path verbs (e.g., cross), manner verbs (e.g., walk), cause verbs (e.g., throw), generic motion verbs (e.g., get), and non-motion verbs (e.g., copula *be*). Table 6 presents the descriptive statistics for the distribution of verb types by the three groups, and it is graphically represented in Figure 2.

Table 6. Descriptive statistics for the choice of verb types

	Path verbs		Manner verbs		Cause verbs		Generic motion verbs		Non-motion verbs	
	M (*SD*)	%	*M* (*SD*)	%	*M* (*SD*)	%	*M* (*SD*)	%	*M* (*SD*)	%
KM	16.40 (4.69)	82%	1.73 (1.22)	8.65%	1.87 (5.08)	9.35%	0	0	0	0
EFL	5.85 (4.75)	29.25 %	6.12 (5.02)	30.6%	7.01 (5.95)	35.05 %	.94 (1.82)	.05 %	.07 (.38)	.35 %
EM	1.47 (2.23)	7.35%	13.27 (4.51)	66.35 %	5.27 (5.43)	26.35 %	0	0	0	0

Note: *n* for KM and EM = 15; *n* for EFL = 80; maximum score = 20.

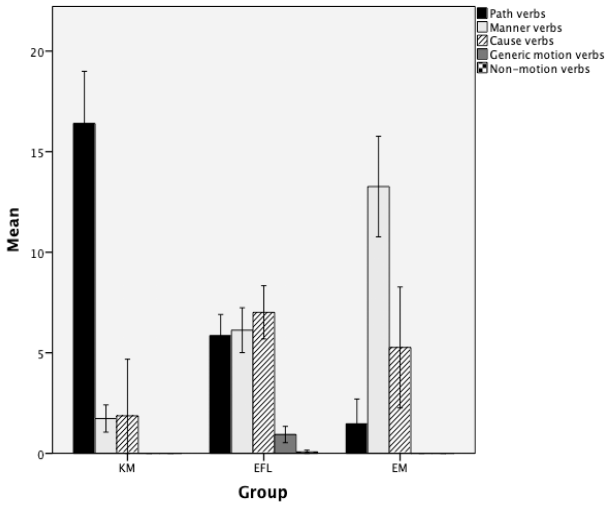

Figure 2. The choice of verb types by group

As shown in Table 6, generic motion verbs and non-motion verbs were only used by the EFL group. Therefore, a MANOVA was performed to compare the frequency of path, manner, and cause verbs used across the three groups. The findings indicated that there were statistically significant group differences on the combined dependent variables as indicated by Pillai's Trace, V = .66, $F(6, 212)$ =17.27, p < .001, partial η^2 = .33. Subsequent univariate ANOVAs showed that statistically significant differences were observed in all three verb types: path verbs, $F(2, 107)$ = 46.53, p < .001, partial η^2 = .47; manner verbs, $F(2, 107)$ = 24.24, p < .001, partial η^2 = .31; cause verbs, $F(2, 107)$ = 5.18, p = .007, partial η^2

= .09. All three Bonferroni post-hoc comparisons for both path and manner verbs were statistically signifiant (p < .001 for all comparisons), indicating that the use of path and manner verbs differed across the three language groups. With regard to the use of cause verbs, the EFL group showed the highest use, followed by the EM and KM groups in that order. While the EFL group was statistically significantly different from the KM group (p = .006), the KM-EM and EFL-EM differences were not found statistically significant. In summary, the two monolingual groups showed a clear preference for one main verb: KM = path verbs (82%); EM = manner verbs (66.35%). However, the EFL group was different from the two monolingual groups in that they did not display a strong preference for one verb type.

5.3. Predictors for EFL learners' motion encoding patterns

To examine whether there were any significant predictors that may contribute to EFL learners' encoding of complex motion events, that is, (1) the frequency of path, manner, and cause encoding, and (2) the frequency of different verb types, a series of stepwise regression analyses were performed with a set of explanatory variables. Following a standard data-screening process, language background variables that had no correlation with a dependent variable were not entered into the regression model as predictors. As shown in Table 7, the frequency of path encoding, manner encoding, and cause encoding correlated with some of the explanatory variables to a modest degree: the frequency of path encoding positively correlated with EIT scores (r = .35, p < .05), GR vocab (r = .30, p < .001), GP vocab (r = .37, p < .001), MR vocab (r = .24, p < .05), and MP vocab (r = .37, p < .001). The frequency of manner encoding positively correlated with L2 use (r = .22, p < .05) only. Lastly, the frequency of cause encoding positively correlated with three of the four vocabulary measures: GR vocab (r = .25, p < .05), GP vocab (r = .27, p < .05), and MP vocab (r = .23, p < .05). However, none of the frequency of verb types was found to correlate with explanatory variables. As a result, subsequent stepwise regression analyses were conducted only with the frequency of path, manner, and cause encoding.

Table 7. Pearson correlations between frequency of encoding scores and language background measures

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	.05	.26*	-.15	.35*	.16	.21	.19	.30**	.37**	.24*	.37**
2		1	.09	-.01	.13	.22*	-.11	.10	.01	.08	.08	.20
3			1	-.01	.14	.01	-.05	.13	.25*	.27*	.07	.23*
4				1	-.21	-.22	-.30**	-.10	-.10	-.19	-.06	.01
5					1	.23*	.12	.44**	.42**	.63**	.38**	.25*
6						1	.36**	.14	.25*	.36**	.18	.14
7							1	-.05	.10	.17	.10	.12
8								1	.30**	.43**	.26*	.16
9									1	.68**	.52**	.26*
10										1	.41**	.29**
11											1	.24*
12												1

Note: 1 = frequency of path encoding; 2 = frequency of manner encoding; 3 = frequency of cause encoding; 4 = age of onset; 5 = EIT; 6 = L2 use; 7 = length of study; 8 = length of immersion; 9 = GR (general receptive) vocab; 10 = GP (general productive) vocab; 11 = MR (motion-specific receptive) vocab; 12 = MP (motion-specific productive) vocab. *p < .05, **p < .01.

The first regression was performed on the frequency of path encoding as the dependent variable and five predictor variables as independent variables based on the correlation results: EIT scores, GR vocab, GP vocab, MR vocab, and MP vocab. While the four vocabulary scores understandably correlated with each other, none displayed collinearity (r < .90 as suggested by Plonsky and Ghanbar, 2018), and therefore, they were entered into the regression equation. The regression results demonstrated that the only measures that significantly predicted the frequency of path encoding were GP vocab and MP vocab, a = .05 level, $F(2, 77) = 10.31$, p < .01, with R^2 = .21. The unique contribution of each vocabulary measure was approximately 14% and 7%, respectively, and the approximately 21% of the variance in the frequency of path encoding could be explained by the combination of these predictors.

The second stepwise regression analysis was conducted on the frequency of manner encoding with L2 use as the sole predictor. The regression model was found to be statistically significant, $F(1, 78) = 4.05$, p = .048, R^2 = .05, indicating that L2 use accounted for approximately 5% of the total variance in the frequency of manner encoding.

Lastly, the third stepwise regression analysis was performed on the frequency of cause encoding with three vocabulary measures: GR vocab, GP vocab, and MP vocab. The results indicated that GP vocab was the only significant predictor in the regression, $F(1, 78) = 6.21$, p = .015, R^2 = .07, accounting for approximately

7% of the total variance in the frequency of cause encoding.

6. Discussion

6.1. Monolinguals' motion encoding patterns

The first research question investigated how Korean and English monolingual speakers encoded complex motion events in their respective L1s. Motion encoding patterns were analyzed in terms of the frequency of encoding path, manner, and cause information and the type of verb used in their motion descriptions. The results of the frequency of encoding patterns revealed that path and cause encoding was comparably high for the Korean and English monolinguals, while their likelihood of manner encoding contrasted: As speakers of a S-language, the English monolinguals encoded manner information more frequently than the Korean monolinguals, who were speakers of a V-language. The fact that language specificity was only observed in monolingual speakers' manner encoding provides support for Slobin's manner salience hypothesis (1996, 2004), which postulates that languages differ with regard to the amount of attention given to manner of motion, but not necessarily to path of motion. Furthermore, the current findings revealed that the monolingual speakers' path and manner encoding patterns paralleled those found in their descriptions of spontaneous motion events in Park (2019). Since the present study and Park (2019) shared the same participants, it was possible to make a direct comparison between their descriptions of spontaneous motion events and those of complex motion events. A high degree of consistency found between these two types of motion event descriptions suggests that language-specific encoding patterns are fairly persistent across motion contexts. It is also noteworthy to point out that the likelihood of encoding cause in their descriptions reached almost 100% for both monolingual groups. This indicates that cause, along with path information, receives great prominence in linguistic encoding of motion events.

The two monolingual groups also differed in how they structured the selected information in their description of complex motion events, reflecting Talmy's typology of motion events (Talmy 1985, 2000). The Korean monolingual

speakers, as V-language speakers, predominantly preferred to express path information in the main verb, while the English monolinguals, as S-language speakers, showed a preference for manner verbs. In other words, both the Korean and English speakers extended their general tendency to encode path or manner, respectively, in the main verb to describe complex motion events (Berman and Slobin 1994; Park 2019; Slobin 2004). These findings were in contrast to Choi (2009), which, based on participants' performance on two stimuli videos, reported that Korean speakers preferred to express path in the main verb whereas English speakers tended to encode cause in the main verb. Despite the fact that both monolingual encoded cause to a high degree in the present study, neither group favored encoding it in the main verb when other elements of motion competed for that position. This suggests that the relative preference for one verb type over the other is a firmly established tendency that persists across motion contexts.

In summary, both universal and language-specific encoding patterns were found in speakers' complex motion event descriptions. Both Korean and English speakers showed a strong preference in selecting path and cause of motion for verbalization. However, cross-linguistic differences emerged in how they selected and structured manner of motion. As V-language speakers, the Korean monolinguals often omitted manner information and when they did express it, they used means other than the main verb to do so. In contrast, the English monolinguals, as S-language speakers, exhibited a strong tendency to encode manner, and they showed a predilection to conflate it with the main verb. It is also worth noting that the encoding patterns with respect to path and manner largely mirrored those found in the participants' descriptions of spontaneous motion events (Park 2019). This suggests that speakers' routinized way of expressing path and manner of motion tends to generalize across motion contexts, prevailing over other possible ways to express them for verbalization.

6.2. EFL learners' motion encoding patterns

As speakers of two typologically different languages, the Korean EFL learners utilized various encoding patterns to describe complex motion events. First, the

EFL learners' likelihood of encoding causation was as high as that of the two monolingual groups, suggesting that expressing causation when it is featured in a scene is a tendency shared across language groups. Second, an instance of L1 transfer was found in their likelihood of encoding manner information. As it was the case with their descriptions of spontaneous motion events (Park 2019), the EFL learners' frequency of manner encoding was comparable to that of the Korean monolingual group and was significantly lower than that of the English monolingual group. This suggests that V-language speakers' tendency to omit manner information was quite prevalent among the EFL learners in their descriptions of complex motion events in the L2.

Lastly, the EFL group also exhibited two unique, divergent behaviors that could not be traced back to preferences of either of the monolingual groups. One of them was their relatively lower tendency to encode path information compared to the two monolingual groups, which was also observed in their descriptions of spontaneous motion events (Park 2019). The lower path encoding does not reflect an instance of L1 influence or L2 approximation as both monolingual groups encoded path in their descriptions with an equally high level of frequency. A more plausible account for this encoding pattern, as has been introduced in Park (2019), may be an avoidance strategy. Since the most prototypical way to encode path information in English is by means of a preposition (e.g., across, into, out of), the frequency of path encoding in part depends on speakers' knowledge and use of English spatial prepositions. The non-target-like use of path particles in the EFL data, despite its low incidence (only 2.55%; see section 5.1. and footnote 4) provides evidence that the EFL learners may have not yet developed a full understanding of how the English preposition system works, especially in the context of describing motion events, at the time of testing, and as a result, may have avoided using prepositions all together. Supportive evidence for this speculation also comes from some of the EFL learners' descriptions that were missing a preposition ('The woman walks the street kicking a box,' intended to say 'The woman walks *across* the street kicking a box') and thus were grammatically incorrect. Such cases show that the lack of a preposition in the description may be attributed to their limited prepositional knowledge. This speculation also fits well with existing SLA research, which amply documents that English prepositions are notoriously

difficult for learners of English (Gardner and Davies 2007; Liu 2011; Tyler, Mueller, and Ho, 2011; White 2012; Zhao and Le, 2016) and that avoidance is a common phenomenon when it comes to prepositions in particular (Becker 2014; Dagut and Laufer 1985; Laufer and Eliasson 1993; Liao and Fukuya 2004).

Another characteristic of the ELF group that is divergent from the two monolingual groups is found in their use of different verb types. While the Korean and English groups predominantly made use of one verb type over the others (Korean = path verbs; English = manner verbs), the EFL learners did not show a strong preference for one verb type. Instead, they employed all three verb types (path, manner, and cause verbs) to a similar degree, demonstrating that there was no consistency in which component they conflated with the main verb. The lack of a clear pattern with their choice of verb type is different from what was found in Park (2019). In their descriptions of spontaneous motion events, the EFL learners preferentially chose to encode manner in the main verb, suggesting that their choice of verb type approximated that of the English monolingual speakers. However, such L2-based patterns were not observed in this study. The mixed patterns observed in the data suggest that the EFL learners may have not yet fully acquired the most prototypical verb choice to describe complex motion events in the L2.

In summary, the EFL learners utilized a variety of encoding patterns to express complex motion events in the L2. They employed encoding patterns that were universal to all speakers, L1-based encoding patterns, as well as unique, divergent characteristics of the EFL learners that reflected their ongoing learning of the L2 encoding patterns. The findings further suggest that the way the EFL learners described complex motion events were quite similar to the way they described spontaneous motion events, although not identical.

6.3. Predictors for EFL learners' motion encoding patterns

The third research question probed whether the EFL learners' L2 encoding patterns were mediated by their language-related factors, such as age of onset, EIT scores, L2 use, length of study, length of immersion in an English-speaking country, and different types of vocabulary (i.e., GR vocab, GP vocab, MR vocab,

and MP vocab) scores. While none of these factors predicted the EFL learners' use of different verb types (e.g., path verbs, manner verbs, cause verbs) in their L2 descriptions of complex motion events, some mediated their likelihood of encoding path, manner, and cause. The best predictors of the frequency of encoding patterns were as the following: the two productive vocabulary scores (GP and MP vocab) for path encoding (21%), L2 use for manner encoding (5%), and GP vocab for cause encoding (7%). The positive associations between these language-related factors and the likelihood of encoding different motion components demonstrate that higher proficiency or use in English tends to increase their tendency to encode different aspects of motion events in their L2. The fact that the tendency to encode manner, which is considered a salient characteristic of English speakers, is associated with higher L2 use supports Cadierno and Ruiz (2006), which concluded that L2 learners' reliance on L1 motion encoding patterns tends to reduce as they develop higher L2 proficiency.

It is worth noting that factors that predicted the EFL learners' English-like encoding patterns in the present study were not identical to those emerged as significant predictors in Park (2019). While the EFL learners' English-like encoding patterns of spontaneous motion events were conditioned by EIT scores in Park (2019), their English-like encoding patterns of complex motion events were largely predicted by L2 productive vocabulary test scores (and for fewer analyses, L2 use). Such mixed results are not surprising given that the cognitive processing load is different for spontaneous and complex motion events. Cognitive processing load is likely to be heavier for speakers when they describe motion event scenes with three, as opposed to two, motion components (i.e., path, manner, and cause). Therefore, it is possible that different language-related factors were at play in conditioning the EFL learners' encoding patterns in different motion event scenes (spontaneous motion events vs. complex motion events).

7. Conclusions

The present study sought to advance motion event research by investigating how speakers of different languages express complex motion events that include path, manner, and cause of motion. The findings demonstrated that some

encoding patterns were shared across monolingual speakers (i.e., high frequency of path and cause encoding), thus being universal, while others were more specific to a particular language group (i.e., a strong preference for omitting manner encoding and using a path verb for Korean speakers). The EFL learners employed a variety of encoding patterns, including universal patterns, L1-based patterns, and unique patterns that are specific to L2 learners. Among many language-related factors, L2 productive vocabulary test scores modulated the likelihood of encoding various aspects of motion events. A direct comparison between the present study and Park (2019) further revealed that all three language groups utilized similar encoding patterns in their descriptions of spontaneous as well as complex motion events. This suggests that speakers' routinized way of expressing path and manner of motion tends to persists across motion contexts.

In evaluating the current findings, it is important to acknowledge some limitations. First, the ratio of the sample size for EFL learners to the number of language-related factors was relatively small and in turn, it might have hindered the precise determination of the association between EFL learners' encoding patterns and language-related factors. Second, the accuracy of measuring EFL learners' motion-specific productive vocabulary size could have been enhanced by asking participants to write down any expressions that refer to motion rather than restricting their responses to motion verbs only.

The results of the present study also encourage future research that further explores the encoding of complex motion events in a number of interesting ways. As pointed out by an anonymous reviewer, the type of manner involved in motion events may affect speakers' likelihood of manner encoding. For instance, V-language speakers may consider the manner of motion as basic as 'walk' not worthwhile to include in their description. Considering that ten of the 20 items in the video description task used 'walk' as the manner of spontaneous motion, it is possible that the choice of manner of motion for the present study might have contributed to the low frequency of manner encoding for the Korean monolingual speakers and the EFL learners. Thus, investigating complex motion events with a variety of manner components that are more salient than 'walk' (e.g., crawl, slide) will aid in capturing a fuller picture of how speakers encode manner of motion.

In addition, it would be worthwhile to investigate speakers' complex motion event expressions at the constructional level (Goldberg 2016). To date, most studies on the topic of motion events have taken a construction-based approach to analyze motion event descriptions, and this is largely due to the fact that a verb is a strong predictor of construction meaning. However, more attention should be given to how other motion components that do not get conflated with the main verb are expressed in speakers' motion event descriptions. Thus, investigating each language group's preferred construction types for motion event descriptions will provide new insights into motion event research.

References

Becker, Tony. 2014. Avoidance of English phrasal verbs: Investigating the effect of proficiency, learning context, task type, and verb type. *Asian Journal of English Language Teaching* 24: 1–33.

Berman, Ruth and Dan Issac Slobin. 1994. *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale: Lawrence Erlbaum.

Cadierno, Teresa. 2010. Motion in Danish as a second language: Does the learner's L1 make a difference? In ZhaoHong Han and Teresa Cadierno (eds.), *Linguistic relativity in SLA: Thinking for speaking*, 1–33. Clevedon: Multilingual Matters.

Cadierno, Teresa and Lucas Ruiz. 2006. Motion events in Spanish L2 acquisition. *Annual Review of Cognitive Linguistics* 4(1): 183–216.

Choi, Soonja and Melissa Bowerman. 1991. Learning to express motion events in English and Korean: The influence of language-specific lexicalization patterns. *Cognition* 41: 83–121.

Choi, Soonja. 2009. Typological differences in syntactic expressions of path and causation. In Virginia Gathercole (ed.), *Routes to language: Studies in honor of Melissa Bowerman*, 169–194. Mahwah, NJ: Lawrence Erlbaum Associates.

Choi, Soonja. 2011. Language-specificity of motion event expressions in young Korean children. *Language, Interaction and Acquisition* 2(1): 157–84.

Daller, Michael, Jeanine Treffers-Daller, and Reyhan Furman. 2011. Transfer of conceptualization patterns in bilinguals: The construal of motion events in Turkish and German. *Bilingualism: Language and Cognition* 14(1): 95–119.

Dagut, Menachem and Batia Laufer. 1985. Avoidance of phrasal verbs — a case for contrastive analysis. *Studies in Second Language Acquisition* 7(1): 73–79.

Fausey, Caitlin M., Bria L. Long, Aya Inamori, and Lera Boroditsky. 2010. Constructing

agency: The role of language. *Frontiers in Cultural Psychology*. 1: 162.

Férez, Paula Cifuentes. 2008. *Motion in English and Spanish: A perspective from cognitive linguistics, typology and psycholinguistics*. PhD Dissertation. University of Murcia.

Gardner, Dee and Mark Davies. 2007. Pointing out frequent phrasal verbs: A corpus-based analysis. *TESOL Quarterly* 41(2): 339–59.

Goldberg, Adele. 2016. Partial productivity of linguistic constructions: Dynamic categorization and statistical preemption. *Language and Cognition* 8(3): 369–390.

Ji, Yinglin and Jill Hohenstein. 2014. The syntactic packaging of caused motion components in a second language: English learners of Chinese. *Lingua* 140: 100–116.

Ji, Yinglin, Henriëtte Hendriks, and Maya Hickmann. 2011. How children express caused motion events in Chinese and English: Universal and language-Specific influences. *Lingua* 121(12): 1796–1819.

Kwon, Iksoo. 2016. How do Koreans break and cut things?: A cognitive-semantics approach to BREAK predicates and CUT predicates in Korean. *Linguistic Research* 33(1): 65–94.

Larrañaga, Pilar, Jeanine Treffers-Daller, Françoise Tidball, and Mari-carmen Gil Ortega. 2011. L1 transfer in the acquisition of manner and path in Spanish by native speakers of English. *The International Journal of Bilingualism* 16(1): 117–38.

Laufer, Batia and Stig Eliasson. 1993. What causes avoidance in L2 learning. *Studies in Second Language Acquisition* 15(1): 35–48.

Laufer, Batia and Paul Nation. 1999. A vocabulary-size test of controlled productive ability. *Language Testing* 16(1): 33–51.

Lee, Jeong-Hwa. 1999. A cognitive approach to connective particles *-e* and *-ko*: Conceptual unity and conceptual separation in Korean motion verbs. *Japanese/Korean Linguistics* 9: 225–39.

Liao, Yan and Yoshinori Fukuya. 2004. Avoidance of phrasal verbs: The case of Chinese learners of English. *Language Learning* 54(2): 193–226.

Mayer, Mercer. 1969. *Frog, Where are you?* New York: Dial Press.

Liu, Dilin. 2011. The most frequently used English phrasal verbs in American and British English: A multicorpus examination. *TESOL Quarterly* 45: 661–88.

Nation, Paul and David Beglar. 2007. A vocabulary size test. *The Language Teacher* 31(7): 9–13.

Oh, Kyung-ju. 2003. *Language, cognition, and development: Motion events in English and Korean*. PhD Dissertation. University of California, Berkeley.

Ortega, Lourdes, Noriko Iwashita, John M. Norris, and Sara Rabie. 2002. *An investigation of elicited imitation tasks in crosslinguistic SLA research.* Second Language Research Forum, October, Toronto, Canada.

Park, Hae In. 2019. How do Korean–English bilinguals speak and think about motion events? Evidence from verbal and non-verbal tasks. *Bilingualism: Language and Cognition*,

First View, 1–17.

Plonsky, Luke and Hessameddin Ghanbar. 2018. Multiple regression in L2 research: A methodological synthesis and guide to interpreting R^2 values. *The Modern Language Journal* 102(4): 713–731.

Slobin, Dan Issac. 1996. Two ways to travel: Verbs of motion in English and Spanish. In Masayoshi Shibatani and Sandra Thompson (eds.), *Grammatical constructions: Their form and meaning*, 195–219. Oxford: Clarendon Press.

Slobin, Dan Issac. 2004. How people move: Discourse effects of linguistic typology. In Carol Lynn Moder and Aida Martinovic-Zic (eds.), *Discourse across languages and cultures*, 195–210. Amsterdam/Philadelphia: John Benjamins.

Slobin, Dan Issac. 2006. What makes manner of motion salient? Explorations in linguistic typology, discourse, and cognition. In Maya Hickmann and Stéphane Robert (eds.), *Space in languages: Linguistic systems and cognitive categories*, 59-81. Amsterdam/Philadelphia: John Benjamins.

Talmy, Leonard. 1985. Lexicalization patterns: Semantic structure in lexical forms. In Timothy Shopen (ed.), *Language typology and syntactic description: vol. 3. Grammatical categories and the lexicon*, 57–149. New York: Cambridge University Press.

Talmy, Leonard. 2000. *Toward a cognitive semantics*. Cambridge: MIT Press.

Treffers-Daller, Jeanine, and Andreea Claude. 2015. The role of statistical learning in the acquisition of motion event construal in a second language. *International Journal of Bilingual Education and Bilingualism* 15(5): 602-623.

Tyler, Andrea, Charles Mueller, and Vu Ho. 2011. Applying Cognitive Linguistics to learning the semantics of English prepositions to, for, and at: An experimental investigation. *VIGO International Journal of Applied Linguistics* 8: 181–206.

White, Benjamin. 2012. A conceptual approach to the instruction of phrasal verbs. *The Modern Language Journal* 96(3): 419–438.

Zhao, Helen and Fenfen Le. 2016. Measuring L2 explicit knowledge of English verb-particle constructions: Frequency and semantic transparency at two proficiency levels. In Lourdes Ortega, Andrea Tyler, Hae In Park, and Mariko Uno (eds.), *The usage-based study of language learning and multilingualism*, 171–186. Washington, DC: Georgetown University Press.

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