



A nanosyntactic approach to the parameterization of directed motion constructions in English, Korean, and Russian^{*}

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Cho, Jacee and Hakyung Jung. 2025. A nanosyntactic approach to the parameterization of directed motion constructions in English, Korean, and Russian. *Linguistic Research* 42(1): 31-52. The aim of this paper is to propose a typology of how languages differ in packaging specific semantic elements into the verb and the goal complement in directed motion expressions. We build on the nanosyntactic approach to crosslinguistic variation in directed motion constructions, as proposed by Son and Svenonius (2008), and provide supporting experimental data. Three language types are distinguished based on the lexicalization patterns of the semantic elements Path_{GOAL} and Dir, exemplified by Korean, Russian, and English. Our experimental study reveals a strong association between the presence of an overt goal and the use of the deictic motion verb *ka-ta* in Korean, which we attribute to the encoding of Path_{GOAL} in *ka-ta*. In contrast, no such correlation was observed in English and Russian, in which Path_{GOAL} is not lexicalized by verbs. English and Russian differ in that English manner-of-motion verbs do not encode Dir, while Russian manner-of-motion verbs distinguish unidirectional and multidirectional motions through verbal stem variation. This difference results in the distinctive use of unidirectional verbs in Russian for unidirectional motion events both with and without overt goals, whereas in English, there are no specific patterns related to directionality. (University of Wisconsin-Madison · Seoul National University)

Keywords language typology, directed motion constructions, nanosyntax, Korean, English, Russian

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1. Introduction

In Talmy's (1985) typology of motion expression, languages are divided into verb-framed languages and satellite-framed languages, based on whether the semantic component Path is encoded by the verbal root or expressed by other elements ('satellites') such as prepositions, prefixes, and particles. In this typology, English and Russian are categorized as satellite-framed languages while Korean is considered a verb-framed language. However, substantial differences in how various semantic components of motion events are expressed in Korean, Russian, and English are more complex than this binary classification suggests. For instance, the distribution of Path alone does not fully account for why Russian and English manner-of-motion verbs behave differently from each other even though both Russian and English belong to the same typological category.

Following the view that the semantic structure of a sentence is fed directly by an arguably universal fine-grained functional structure (Borer 2005; Ramchand 2008), Son and Svenonius (2008) provided a crosslinguistic analysis of directed manner-of-motion constructions within the nanosyntactic framework. In nanosyntax (e.g., Stark 2009; Cinque and Rizzi 2010; Svenonius 2016) morphemes are not atomic, but are composed of hierarchical syntactic structures made up of smaller, grammatical or semantic features. These features correspond to functional heads in the syntactic tree. Nanosyntax effectively explains variation across languages by showing how different languages spell out the same syntactic structures using different morphemes or combinations of morphemes. In this paper, we show how English, Russian, and Korean differ in packaging specific semantic elements into the verb and the goal complement in directed motion expressions. We elaborate on Son and Svenonius' analysis (2008), in which the semantic components of directed motion construction (DMC) such as Dir, Path, and Place are identified between the verbal head (Proc) and the goal complement DP, providing our experimental data collected from native speakers of the three languages to support the elaborated typology.¹

The structure of the paper is as follows: Section 2 illustrates crosslinguistic variation

1 Son and Svenonius (2008) used the term DMMC (directed manner of motion construction) for their typology, but in fact non-manner deictic verbs are also parameterized in their work. In this paper, non-manner deictic verbs such as *ka-ta* (Korean) and *go* (English) are included as well as manner-of-motion verbs such as *tali-ta* (Korean) and *run* (English). Thus, we use the term DMC (directed motion construction) for our typology.

in lexicalization of motion event constructions in Korean, English, and Russian, focusing on the peculiarity of Russian as this language morphologically distinguishes different types of directionality. Sections 3 and 4 provide experimental data of language use patterns that support the typology. Section 5 contains discussions of the results and conclusions.

2. Crosslinguistic variation in directed manner of motion constructions in Korean, English, and Russian

According to Ramchand's (2008) semantic model, the semantics of the verb phrase (VP) is derived from their corresponding functional heads, and each node of the structure must be licensed by an appropriate lexical item. The functional structure and the licensing mechanism are argued to be universal. Thus, language variation lies in the way each functional head is lexicalized. Reflecting the cartographic structure of a prepositional phrase in the sense of Koopman (2000), Den Dikken (2003), and Svenonius (2007), Figure 1 illustrates the functional structure of the VP of directed motion event expressions (modified from Son and Svenonius [2008]):

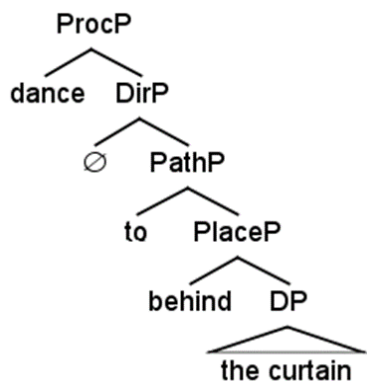


Figure 1. Functional structure of VP

According to Son and Svenonius (2008), crosslinguistic patterns of DMC can be captured by how functional heads are lexicalized. An important aspect of Son and Svenonius' (2008) proposal about language-specific patterns of lexicalizing functional

heads is the notion of ‘spanning’ (a term due to Williams 2003), according to which one lexical item can ‘span’ more than one functional head to license. That is, languages may differ with respect to the spanning patterns as well as which functional head is overtly lexicalized. Son and Svenonius (2008) identified three crosslinguistic patterns, as outlined below (from most to least restrictive with respect to the range of verbs allowed in DMC).

Type 1. In such languages as Korean, manner-of-motion verbs do not contain morphemes (either overt or null) to license Path, and thus cannot license the goal PP (1a). In this type of languages, Path is licensed by directed motion verbs (deictic verbs) such as *go* and *come* or complex motion verbs combining *go/come* and manner-of-motion verbs. In Korean, the goal PP appears as a location (Place) PP since Path is lexicalized by the deictic motion verbs *ka-ta* ‘go’ and *o-ta* ‘come’ (1b).

(1) Korean

- a. Mary-nun *cip-ey tali-ess-ta.
 Mary-TOP home-LOC run-PAST-DECL
 Intended: ‘Mary ran home.’
- b. Mary-nun cip-ey (tali-e-)ka-ss-ta.
 Mary-TOP home-LOC (run-CONN-)go-PAST-DECL
 ‘Mary went home.’

Type 2. If a language has a morpheme(s) to license Path (verbal prefixes, prepositions), then canonical manner-of-motion verbs (e.g., *walk*, *run*, *swim*) can be used in DMC. Son and Svenonius (2008) identified Malayalam as such a language, as exemplified in (2a, b).

(2) Malayalam

- a. Mary office-il-ekkə {naṭann-u/ooṭ-i}.
- Mary office-LOC-DIR walk-PAST/run-PAST
 ‘Mary walked/ran to the office.’
- b. aṭal paala.tt-iṇṭe aṭiy-il-ekkə naṭann-u.
- she bridge-GEN under-LOC-DIR walk-PAST
 ‘She walked under the bridge (and stopped there).’ (Dir: telic path)

(Son and Svenonius 2008: 390)

Type 3. If a language licenses Dir with a null morpheme and Path with an overt morpheme, then any motion verbs (canonical, non-canonical, and deictic) can be used in DMC. English is a representative example of this type. As illustrated in (3a, b), English utilizes any process verbs as well as manner-of-motion verbs in DMC.

(3) English

- a. John walked to the store
- b. John danced into the room.

The lexical decomposition patterns in Types 1-3 are summarized in Table 1.

Table 1. Typology from Son and Svenonius (2008: 395)

	PROC	DIR	PATH	PLACE	DP
Korean		<i>ka</i> 'go'		<i>-ey</i> LOC	<i>cip</i> 'house'
Malayalam	PROC	DIR	PATH	PLACE	DP
	<i>naṭann-</i> 'walk'		<i>-ekkə</i> 'to'	<i>-il</i> LOC	<i>office</i> 'office'
English	PROC	DIR	PATH	PLACE	DP
	<i>dance</i>	∅	<i>to</i>	<i>behind</i>	<i>the curtain</i>

Note. The symbol ∅ indicates a null morpheme. The grey-shaded areas indicate the range of spanning of verbs

Type 1 facilitates further predictions, as the Korean deictic motion verb *ka-ta* 'go' can take a goal either as a direct object or as a location phrase, as illustrated in (4a).² In contrast, sentence (4b) demonstrates that a direct object goal is incompatible

² The Acc-marking postposition *-lul* and the Loc-marking *-ey* may be omitted (e.g. *hakkyo-∅ ka-ss-ta*), which is frequent in colloquial speech in Korean. The direct object may further incorporate into the verb *ka-ta*, resulting in the compound form *hakkyo-ka-ta*. This patterns with the incorporation of direct object nouns to the light verb such as *ha-ta* 'do' in Korean (Kwon and Zribi-Hertz 2006), as illustrated in (i):

- (i) a. Mary-nun onul kongpwu-lul ha-koiss-ta.
 Mary-TOP today study-ACC do-PROG-DECL
 'Mary is studying today.'
- b. Mary-nun onul kongpwu-∅ ha-koiss-ta.
- c. Mary-nun onul kongpwu-ha-koiss-ta.

with the manner verb *tali-ta* ‘run,’ just like the location goal can be paired with *ka-ta* ‘go’ but not with *tali-ta*.

- (4) a. Mary-nun hakkyo-lul/hakkyo-ey ka-ss-ta.
 Mary-TOP school-ACC/school-LOC go-PAST-DECL
 ‘Mary went to the school.’
 b. Mary-nun *hakkyo-lul/*hakkyo-ey tali-ess-ta.
 Mary-TOP school-ACC/school-LOC run-PAST-DECL
 Intended: ‘Mary ran to the school.’

The fact that the direct object goal patterns with the locative goal in its compatibility with *ka-ta* (compatible) and *tali-ta* (incompatible) can be explained by assuming that the ‘spanning’ of the verb *ka-ta* may encompass Place in addition to Path, allowing the complement DP to appear as the verb’s direct object. Manner-of-motion verbs encode neither Path nor Place.

Another elaboration on the typology in Table 1 involves the directional postposition *-ulo* in Korean, which is compatible with both *ka-ta* (5a) and manner verbs (5b).

- (5) a. Mary-nun hakkyo-lo ka-ss-ta.
 Mary-TOP school-DIR go-PAST-DECL
 ‘Mary went to the school.’
 b. Mary-nun hakkyo-lo tali-ess-ta.
 Mary-TOP school-DIR run-PAST-DECL
 ‘Mary ran to the school.’

Researchers differ in their analysis of the syntactic nature of the *-ulo* phrase, with some treating it as an adjunct (Lee et al. 1998; Chae 1999, 2000; Zubizarreta and Oh 2007) and others as an argument (Son 2006; Nam 2009). While this paper does not address that debate, if *-ulo*—which Son (2006) identifies as heading the Path phrase—is included in the typology in Table 1, Korean manner-of-motion verbs like *tali-ta* could be interpreted as analogous to manner-of-motion verbs in Type 3.³ How *-ulo*,

3 When *-ulo* is used, the head position of the PlaceP is usually empty, thus lacking a resultative reading, but sometimes Place is also headed by *-ey* in the presence of *-ulo* in Path, resulting in *-ey-lo*, enabling

which arguably heads PathP, can be combined with the verb *ka-ta*, which also includes the Path head, in a sentence like (5a) may be explained by assuming that there are two distinct layers of PathP with different flavors: Path_{GOAL} and Path_{DIRECTIONAL}. The two different Path heads can be lexicalized at the same time by different words, Path_{GOAL} by the verb and Path_{DIRECTIONAL} by the postposition *-ulo*, as shown in Figure 2 (Note that Korean is a head-final language in which the head of a phrase follows its complement).

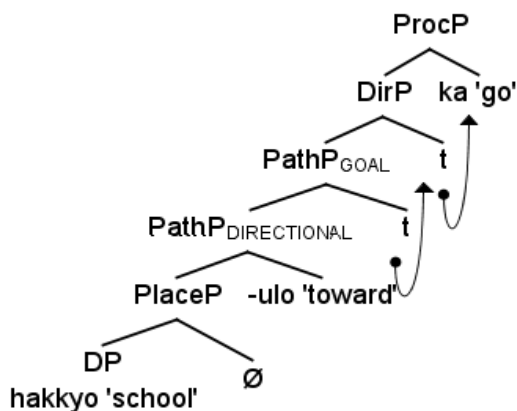


Figure 2. Lexicalization of two different Path heads (Path_{GOAL} and Path_{DIRECTIONAL}) in Korean

This approach can explain why manner verbs, which can only be combined with Path_{DIRECTIONAL}, always denote atelic process whereas *ka-ta* containing Path_{GOAL} can potentially have a telic interpretation. In this sense, Korean differs from Russian and English, in which one preposition spans both Path_{GOAL} and Path_{DIRECTIONAL}, thus resulting in the prevention of two path prepositions co-occurring such as **to toward/*toward to*.

a resultative reading, as exemplified in (i).

- (i) Kohyang-ey-lo-uy kwihwan
 hometown-LOC-DIR-GEN returning
 'Returning to the hometown'

Although *-ey-lo* may be considered as a remnant of Japanese influence, this expression continues to be used in Korean and is listed in the Standard Korean Dictionary published by the National Institute of Korean Language.

We also complement Type 2 in Table 1 by adding Russian. Son and Svenonius (2008: 395) assume that it is typical cross-linguistically for certain canonical motion verbs to lexicalize Dir, including verbs meaning ‘run,’ ‘walk,’ ‘fly,’ etc., as reflected in their typology in Table 1, although this assumption is not overtly supported by formal evidence in the languages they analyze. In Russian, non-prefixed manner-of-motion verbs morphologically distinguish unidirectional and multidirectional motions by utilizing different stem types. As exemplified in Table 2, this morphological distinction assumes one of the two patterns: (a) consonantal stem vs. *-i-* or *-aj-* suffixed stem; (b) second conjugation stem vs. *-aj-* suffixed stem.⁴

Table 2. Directionality opposition of Russian motion verbs

stem distinction	manner	unidirectional	multidirectional
C-stem vs. <i>-aj-</i> stem	sail	<i>plyt'</i>	<i>plavat'</i>
II-conj stem vs. <i>-aj-</i> stem	fly	<i>letet'</i>	<i>letat'</i>

Although a detailed semantic analysis of the opposition between unidirectional and multidirectional motion is beyond the scope of this paper, it is evident that the directionality of motion events is not only conceptually associated with manner-of-motion verbs (Son and Svenonius 2008) but is also explicitly signalled by verbal morphology in some languages. In Russian, manner-of-motion verbs with Dir_{UNI} stems denote directed motion while prepositions and/or prefixes license Path. Manner-of-motion verbs with Dir_{MULTI} stems denote non-directed, aimless motion and are combined with a Place phrase. This difference is illustrated by the examples in (6a, b).⁵

⁴ See Levin (1972, 1978) for a detailed discussion of Russian conjugation, including the distinction between primary (non-suffixed) and secondary (suffixed) stems and two conjugation patterns.

⁵ Motion verbs with Dir_{MULTI} stems can be combined with a goal PP, denoting a single or repeated round trip. We reserve the discussion of whether this usage is classified as a directed motion in this paper (but see Bernitskaia 2017, 2019 for a detailed discussion of this issue).

(6) Russian

- a. Maša idet v magazin.
 Masha_{NOM} walk_{PRST.DIR-UNI} to store_{ACC}
 ‘Masha is walking to the store.’
- b. Maša xodit v magazine.
 Masha_{NOM} walk_{PRST.DIR-MULTI} in store_{PREP}
 ‘Masha is walking (around) in the store.’

The different lexicalization patterns of directed motion constructions in Korean, Russian, and English are summarized in Table 3.

Table 3. A revised typology of lexicalization patterns in DMC

	PROC	DIR	PATH _{GOAL}	PATH _{DIRECTIONAL}	PLACE	DP
Korean	<i>ka</i> ‘go’					
				Ø	-ey	<i>hakkyo</i> ‘school’
	<i>ket</i> ‘walk’	Ø	Ø	-ulo	Ø	
Russian	PROC	DIR	PATH _{GOAL}	PATH _{DIRECTIONAL}	PLACE	DP
	<i>id</i> [uni] / <i>xodi</i> [mult] ‘walk’			v ‘to’	Ø	<i>škola</i> ‘school’
				<i>k</i> ‘toward’		
English	PROC	DIR	PATH _{GOAL}	PATH _{DIRECTIONAL}	PLACE	DP
	<i>go</i>			<i>to</i>	Ø	<i>school</i>
				<i>toward</i>		
	<i>walk</i>	Ø		<i>to</i>		
				<i>toward</i>		

Note. Dark grey-shaded areas indicate the spanning range of deictic and manner-of-motion verbs. Light grey-shaded areas show the spanning of prepositions.

In Sections 3 and 4, we present how the refined typology is supported by our experiments with native speakers of Russian, English, and Korean.

3. Experiment

3.1 Predictions

In light of our elaborated typology summarized in Table 3 in Section 2, we formulate

the following predictions about how native speakers of Korean, English, and Russian will describe directed motion events:

Prediction 1. A range and types of verbs used in the expression

The first prediction is related to the backbone of Son and Svenonius' (2008) typology as well as our revised typology regarding the type of verbs allowing DMC. Recall that Son and Svenonius argued that Korean belongs to the most restrictive type that allows only deictic verbs in DMC. They further stated that manner-of-motion verbs cannot be used as the main verb in DMC. We disagree with their analysis of Korean manner-of-motion verbs by proposing that manner-of-motion verbs as well as deictic verbs can be used in DMC as long as $\text{Path}_{\text{DIRECTIONAL}}$ is licensed by the postposition *-ulo* 'toward.'⁶ So, we predict that Korean speakers will use both deictic and manner-of-motion verbs in describing directed motion events.

Regarding Russian and English, our typology is in agreement with Son and Svenonius' (2008) typology. Russian allows only canonical manner-of-motion verbs in DMC. In English, directed motion can be expressed with almost any manner verbs as well as deictic verbs. Thus, we predict that Russian speakers will exclusively use canonical manner-of-motion verbs while English speakers allow a wide range of manner verbs in their descriptions of directed motion.

Prediction 2. Directed motion events with vs. without a goal

Compared to English and Russian, Korean systematically differentiates the two types of Path (goal vs. directional) in that $\text{Path}_{\text{GOAL}}$ is licensed by deictic verbs via spanning, but $\text{Path}_{\text{DIRECTIONAL}}$ is licensed by the postposition *-ulo* 'toward.' In English and Russian, both $\text{Path}_{\text{GOAL}}$ and $\text{Path}_{\text{DIRECTIONAL}}$ are licensed via a range of different prepositions corresponding to *to* and *toward*, respectively. Thus, Korean speakers will show dichotomous patterns in their use of verbs depending on the type of motion events by using deictic verbs in describing motion events with a goal and manner-of-motion verbs in describing motion events without a goal. English and

6 This does not contradict with the view that manner-of-motion verbs are not classified as motion verbs in Korean (e.g., Chae 1999; Yang 1999). The entire construction, combining manner-of-motion verbs with the *-ulo* phrase, represents directed motion events.

Russian speakers will not show a clear differentiation in their use of verbs in describing motion events with versus without a goal.

Prediction 3. Directionality in Russian

One aspect unique to Russian is that the binary features of directionality (unidirectional vs. multidirectional) are licensed by the verb. Based on the differences between unidirectional and multidirectional motions discussed in Section 2, we predict that Russian speakers will use unidirectional verbs to describe motion events regardless of the presence or absence of goal in pictures when the pictures depict movement proceeding in one direction. This issue does not appear to be directly relevant to crosslinguistic comparisons of DMC since the binary distinction of directionality is absent in English and Korean. However, we include this in our data analysis to further justify our elaborated typology containing fine-drawn analysis of lexicalization patterns in the three types of languages.

3.2 Methodology

Participants and data collection procedure

This study was reviewed as exempt by the Institutional Review Board of the first author's university. Data was collected online via Qualtrics, an online survey software program. Participants included native speakers of English, Korean, and Russian. English speakers were recruited in the US, Korean speakers were recruited from Korea, and Russian speakers were recruited from Russia, Kazakhstan, and the US. Using a demographic questionnaire, we collected general information about participants' linguistic and demographic backgrounds, as summarized in Table 4. A majority of the participants reported that their exposure to languages other than their native language is limited to classroom instruction and they consider themselves as monolingual speakers. Participants completed a survey consisting of a consent form, a written picture description task, and a demographic questionnaire. It took approximately 45 minutes to complete the survey and participants received monetary compensation.

Table 4. Participant information

	English (N=16)		Korean (N=21)		Russian (N=29)	
	Mean	Range	Mean	Range	Mean	Range
AAT (yrs)	43.1	20-81	39.6	22-59	35.5	17-62
Gender	5 males, 11 females		8 males, 13 females		6 males, 21 females, 2 unspecified	

Note. AAT = age at testing

Instrument: Written picture description task

The picture description task contains 104 pictures (52 pictures depicting various motion events and 52 pictures depicting non-motion events) created for this study by a professional illustrator. Participants were instructed to describe what is happening in each picture in one simple sentence. Out of 52 pictures illustrating various motion events, target items include 8 pictures that are relevant to the present study on DMC: directed motion events with a clear goal, as illustrated in Figure 3 (a-d), and directed motion events without a visible goal, as shown in Figure 4 (a-d).

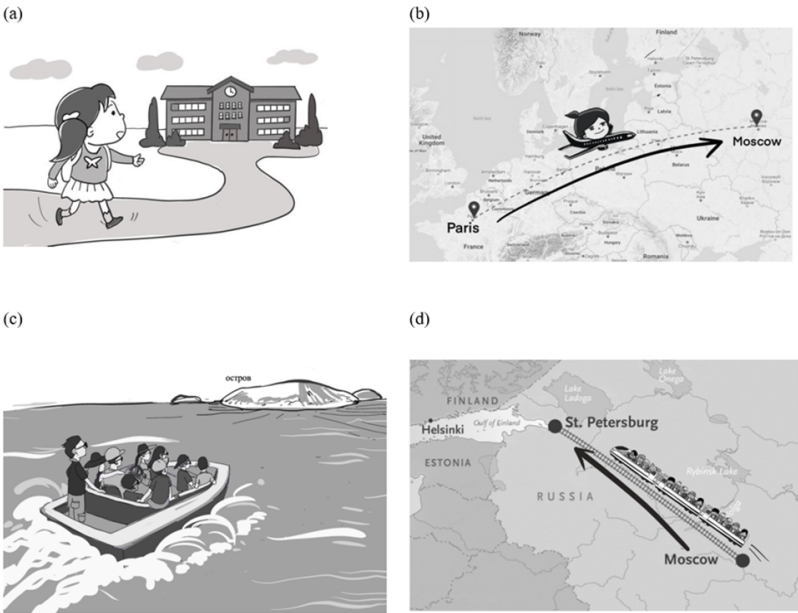


Figure 3. Picture description task items depicting directed motion events with a goal

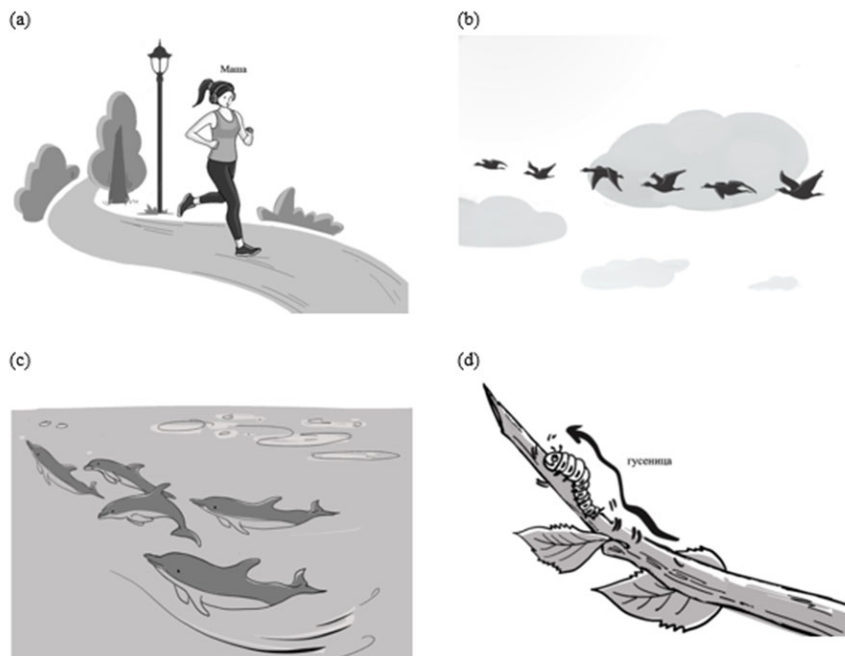


Figure 4. Picture description task items depicting directed motion events without a goal

Data coding

Data were coded by two native speakers of Korean who are fluent in both English and Russian, and the initially coded data were further verified by the authors of the present paper. Each sentence-level description was coded for verbs and other elements such as prefixes, pre-/postpositions, adverbs, particles, and gerunds that express motion, path, goal, or source. The main verbs were coded for type: canonical manner-of-motion (e.g., walk, run, fly), non-canonical manner-of-motion (e.g., dance, jump, prance), or deictic (e.g., go, come). Because the focus of the current study is DMC, we limited our data analysis to the type of the main verb of each sentence and the syntactic makeup of the sentence. We excluded non-motion verbs from data analysis (e.g., think, worry, enjoy).

4. Results

In this section, we report our data in relation to the predictions formulated in Section 3.1. The first prediction was about the type of verbs used in DMC in Korean, Russian, and English. Korean speakers used deictic and canonical manner-of-motion verbs 41% and 59% of the time, respectively. Figure 5 shows the distribution of deictic and manner-of-motion verbs used by Korean speakers. As for Russian speakers, canonical manner-of-motion verbs were used 100 % of the time (Figure 6). English data consisted of 5 % of deictic verbs, 65% of canonical manner-of-motion verbs, and 29% of other manner or motion verbs. English speakers used a wide range of verbs in their expressions of directed motion events, as visualized in Figure 7.

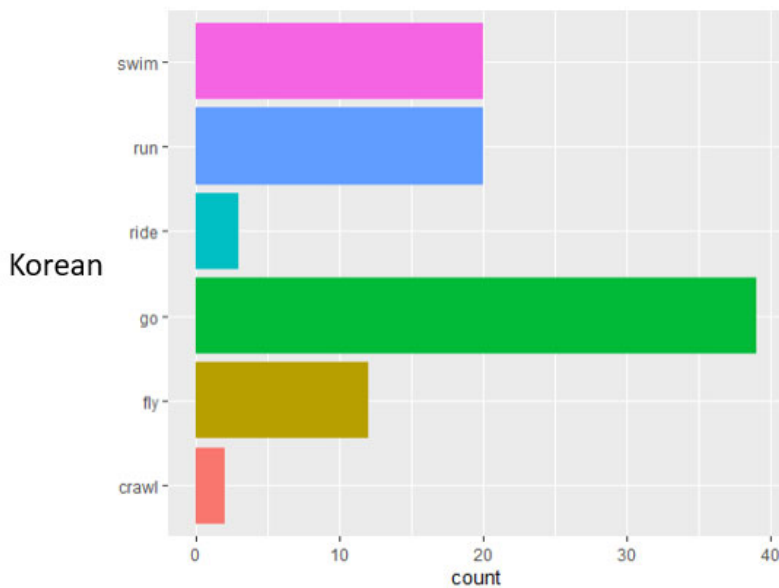


Figure 5. Types of verbs used in directed motion expressions by Korean speakers

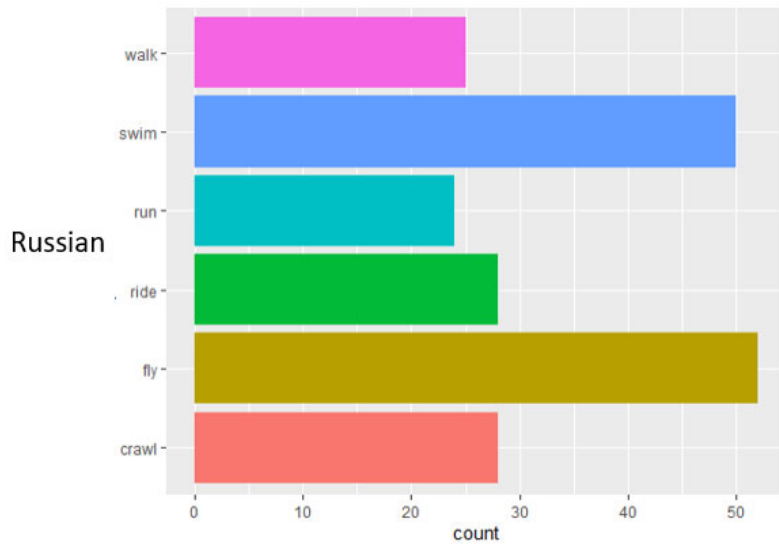


Figure 6. Types of verbs used in directed motion expressions by Russian speakers

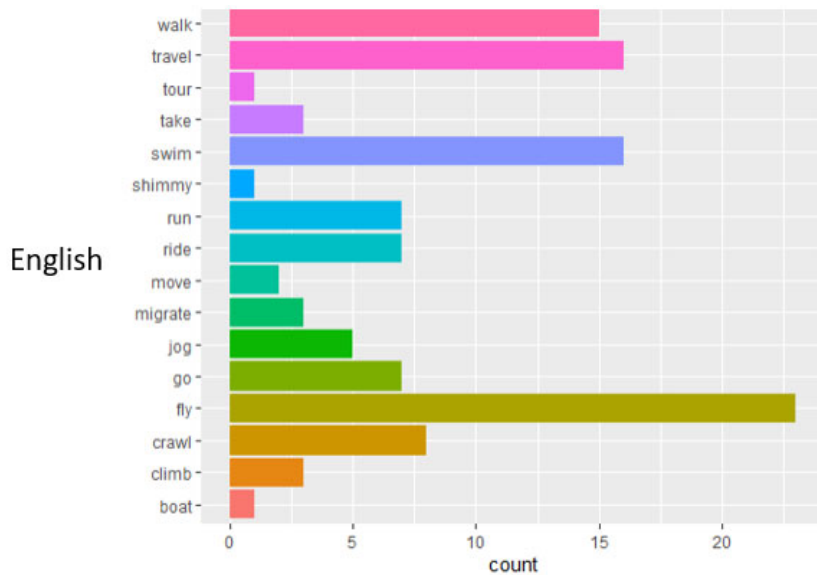


Figure 7. Types of verbs used in directed motion expressions by English speakers

The second prediction was that unlike English and Russian speakers, Korean speakers will show differential patterns with respect to their verb choice in describing directed motion events with versus without a goal. As shown in Figures 8, Korean speakers predominantly used the deictic verb in describing directed motion events with a goal (83%). In contrast, no instances of deictic verb use were found in descriptions of directed motion events without a goal (Figure 9). Unsurprisingly, Russian speakers showed identical patterns in describing two different types of motion events by using canonical manner-of-motion verbs only because deictic verbs are absent and non-canonical manner-of-motion verbs are not allowed in DMC in Russian. English speakers used a larger number of canonical manner-of-motion verbs than pictures with a goal. The level of deictic verb use was low (5%) regardless of the presence or absence of a goal.

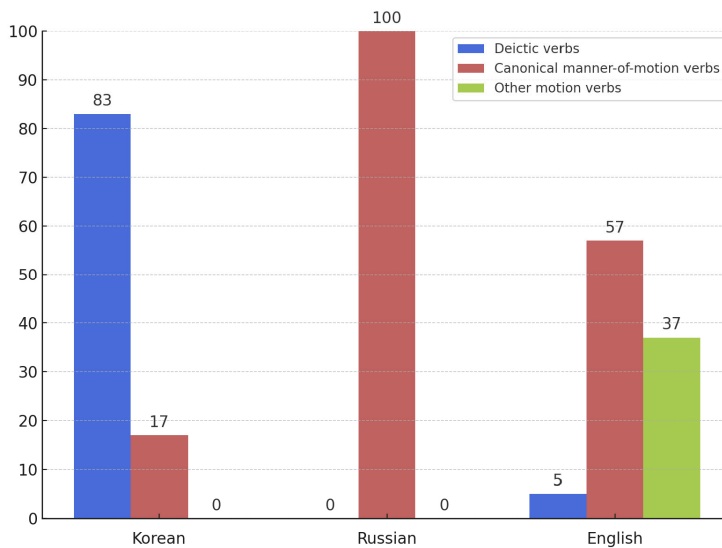


Figure 8. Proportion of use of different verb types in descriptions of directed motion events with a goal

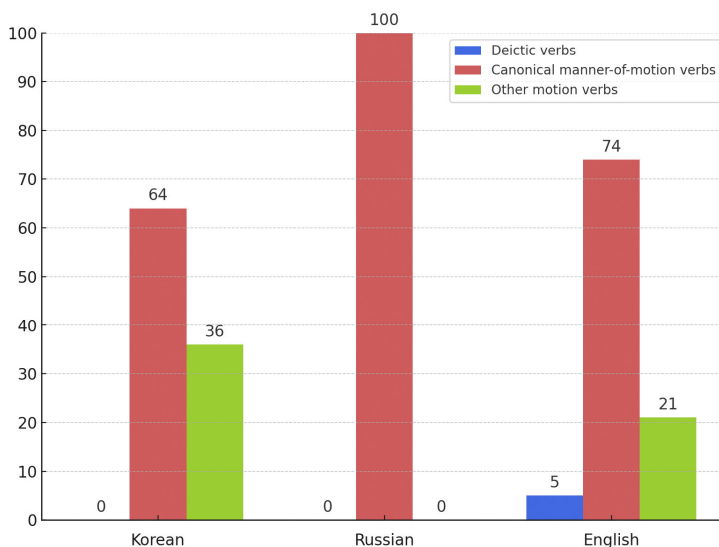


Figure 9. Proportion of use of different verb types in descriptions of directed motion events with no goal

The third prediction we made was about the expression of directionality in Russian. Figure 10 compares use of unidirectional and multidirectional verbs in pictures with versus without a goal. Describing the pictures with a goal, unidirectional verbs were used 100 percent of the time. However, approximately 16 % of instances of multidirectional verb use was found in the descriptions of pictures without a goal. A closer look at individual data indicated that two particular pictures without a goal (a woman running and dolphins swimming in Figure 4a and Figure 4c in Section 3.2, respectively) were interpreted by some Russian speakers as movement proceeding in more than one direction, such as aimless motion, which elicited use of multidirectional verbs (e.g., a woman jogging rather than running in one direction in Figure 4a).

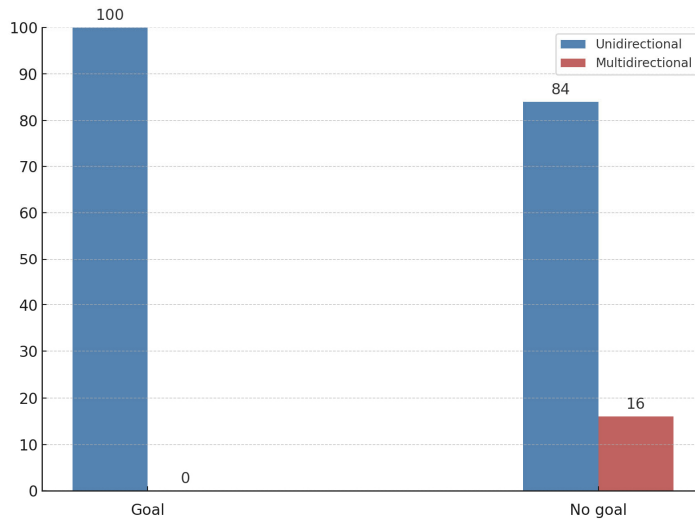


Figure 10. Use of unidirectional versus multidirectional verbs in Russian speakers' descriptions of directed motion events with versus without a goal

5. Discussion and conclusions

The aim of this paper was two-fold. The first goal was to refine Son and Svenonius' (2008) typology within the nanosyntactic approach to the parameterization of DMC. The second goal was to provide experimental data from Korean, Russian, and English to validate the three parameterized patterns of DMC.

According to Son and Svenonius (2008), languages are parameterized with respect to how functional heads of VP (Proc, Dir, Path, Place) for DMC and three crosslinguistic patterns are identified. We further argued that PathP is decomposed into Path_{GOAL} and Path_{DIRECTIONAL} and that the three types of languages systematically differ as to how these two Path heads are licensed. This elaboration is particularly relevant to the most restrictive type of languages, such as Korean, which Son and Svenonius (2008) argue allows only deictic verbs in DMC because Path is licensed by deictic verbs. We proposed that Korean deictic verbs license Path_{GOAL} only. Thus, canonical manner-of-motion verbs can also be used in DMC as long as Path_{DIRECTIONAL} is lexicalized via a postposition *-ulo* 'toward.' We also argued that the semantic

component of directionality is an important element in Russian speakers' use of DMC.

Our picture description data from native speakers of Korean, Russian, and English showed that Korean speakers indeed used canonical manner-of-motion verbs as well as deictic verbs in their directed motion expressions. Russian speakers used canonical manner-of-motion verbs in the unidirectional form 92% of the time. In the English speaker data, a wide range of both motion and non-motion manner verbs as well as a small number of instances of deictic verb use were found.

In general, our data confirmed the predictions formulated based on our refined typology. However, there are two important questions that emerge from our data. The first question is about the use of *-ey* 'at' versus *-ulo* 'toward' in Korean. While the deictic verb *ka-ta* was the exclusive choice to describe the pictures with a goal, the goal itself was expressed through either *-ey* or *-ulo*. This variation can be explained in terms of telicity in event construals, as *-ey* (but not *-ulo*) marks the resulting state (see Son [2006] for a discussion of the resultative parameter in Korean motion constructions). All the pictures in Figure 3 (with a goal) depict situations in which the moving agent is in the midst of motion, yet the goal has not yet been reached. The participants were asked the question, 'What is the figure doing now?' As a result, while the figure is expected to reach the destination, the movement's outcome may or may not be reflected in the responses. We hypothesize that if the pictures had depicted situations where the figure had already arrived at the destination, the majority of responses would have included *-ey* rather than *-ulo*.

The second question is regarding the differential rate of deictic verb use in English versus Korean. Our data showed that English speakers tend to underuse deictic verbs (5%) while Korean speakers frequently used the deictic verb *ka-ta* in expressing directed motion with a goal (83%). One possible reason for the differential use of deictic verbs in Korean and English might be that Korean deictic verb *ka-ta* includes $\text{Path}_{\text{GOAL}}$ while English deictic verb *go* does not. In other words, in Korean deictic verbs license $\text{Path}_{\text{GOAL}}$ and manner-of-motion verbs do not, as a result of which Korean speakers may prefer deictic verbs over manner-of-motion verbs to express directed motion with a goal. In English, on the other hand, $\text{Path}_{\text{GOAL}}$ is not included in either deictic or manner verbs. $\text{Path}_{\text{GOAL}}$ must be expressed via prepositions regardless of the type of verb used.

So, what are the theoretical implications of our study for crosslinguistic variation? Crosslinguistic variation with respect to motion events has been studied largely within

Talmy's (1985) motion typology. However, Talmy's rather coarse-grained approach is insufficient to capture subtle, yet systematic differences among languages in motion expressions. Our study showed that examining language variation from syntactic perspectives can better account for fine-grained differences in lexicalization patterns for motion expressions across languages. Our study also has implications on the methodological level. While there is a plethora of empirical studies examining motion typology within Talmy's framework, there is lack of experimental research on motion typology from a formal linguistic perspective. Our study showed how the parameterization of motion expressions can be studied through an elicited production experiment.

In conclusion, we have shown how differences in DMC in Korean, Russian, and English can be accounted for by the nanosyntactic approach. However, this is just one of the many steps in explaining motion typology within a formal framework. More future investigations involving a large number of languages are needed to establish the tenability of this approach.

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