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# Changes in encoding of PATH of motion in a first language during acquisition of a second language

AMANDA BROWN and MARIANNE GULLBERG\*

## *Abstract*

*Languages vary typologically in their lexicalization of PATH of motion (Talmy 1991). Furthermore, lexicalization patterns are argued to affect syntactic packaging at the level of the clause (e.g., Slobin 1996b) and tend to transfer from a first (L1) to a second language (L2) in second language acquisition (e.g., Cadierno and Ruiz 2006). Crosslinguistic and developmental evidence suggests, then, that typological preferences for PATH expression are highly robust features of a first language.*

*The current study examines the robustness of preferences for PATH encoding by investigating (1) whether Japanese follows patterns identified for other verb-framed languages like Spanish, and (2) whether patterns established in an L1 can change after acquisition of an L2. L1 performance of native speakers of Japanese with intermediate-level knowledge of English was compared to that of monolingual speakers of Japanese and English. Results showed that monolingual Japanese speakers followed basic lexicalization patterns typical of other verb-framed languages, but with different realizations of PATH packaging within the clause. Moreover, native Japanese speakers with knowledge of English displayed mixed patterns for lexicalization and expressed significantly more PATH information per clause than either group of monolinguals. Implications for typology and second language acquisition are discussed.*

*Keywords: motion events, PATH, Japanese, English, second language acquisition, crosslinguistic influence, attrition.*

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## 1. Introduction

In human understanding of motion, the notions of Source (point of origin), PATH (trajectory), and Goal (destination) are core (Johnson 1987). All languages encode such concepts, and the ways in which these elements are mapped onto lexical items pattern remarkably systematically across languages (Talmy 1991). Typological preferences particularly for lexicalization of PATH appear so robust that they affect syntactic packaging at the level of the clause (Slobin 1996b, 1997) and tend to transfer from a first language (L1) to a second (L2) in second language acquisition (e.g., Cadierno 2004; Cadierno and Ruiz 2006; Navarro and Nicoladis 2005; Negueruela et al. 2004; Stam 2006).

The current study examines the robustness of preferences for PATH encoding by investigating whether Japanese follows patterns identified for other verb-framed languages such as Spanish, and whether patterns established in an L1 can change after acquisition of an L2. Distinctive patterns in this crosslinguistic and developmental data would underscore the importance of taking individual language experiences into account in characterizations of languages on the basis of usage data, and would have further implications for our understanding of the relationship between languages in the multilingual mind.

## 2. Background

In influential work, Talmy (1991) has suggested that languages can be divided into two typological groups depending on how PATH of motion is lexicalized: in the verb (verb-framed) or outside the verb (satellite-framed). To illustrate, examples are given below for Japanese (verb-framed) and English (satellite-framed), with PATH expressions underlined.

- (1) *Tama-ga saka-o kudaru*  
 Ball-Nom hill-Acc descend<sup>1</sup>  
 ‘The ball descends the slope’
- (2) *The ball rolls down the hill*

In (1), a prototypical example from Japanese, PATH is lexicalized in the verb *kudaru* ‘descend’. In (2), a corresponding prototypical example from English, PATH is lexicalized in the so-called “satellite” (verb particle) *down*. Refinements of the typology (e.g., Slobin 2004b) notwithstanding, support for the prevalence of basic typological distinctions in lexicaliza-

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1. Abbreviations used in examples are Nom = Nominative Case, Acc = Accusative Case, Gen = Genitive Case, Top = Topic Marker, Con = Connector.

tion of PATH has been found in many empirical studies on different languages (e.g., Gennari et al. 2002; Naigles et al. 1998; Slobin 1996b).

Talmy's typology (1985, 1991, 2000) reflects characteristic preferences in a language, but there are often several options for PATH lexicalization in both satellite-framed and verb-framed languages. In addition to the preponderance of satellites, English, for example, possesses several PATH verbs such as *descend*, *ascend*, etc., although, as Talmy observed, most of these are borrowings from Latin, representing a more formal register, which is not characteristic of English. Japanese, however, has a number of rather more frequent options for PATH expression besides simple main verbs. Example (3) illustrates several of these.

- (3) *Tama-ga* *toi-kara* *detekite* *bowingu-jyou-made*  
 ball-Nom pipe-from exit.come.Con bowling-alley-to  
*haitte* *itte*  
 enter.Con go.Con  
*Lit: 'The ball comes exiting the pipe, and goes entering the bowling alley'*

Example (3) displays three different kinds of possibilities for PATH expression in Japanese other than simple main verbs: postpositions, e.g., *made* 'until/to', *kara* 'from'; complex motion predicates, e.g., *haitte itte* 'go entering', consisting of *hairu* 'enter' and the deictic verb *iku* 'go'; and compound verbs, e.g., *detekite* 'come out', a combination of *deru* 'exit' and *kuru* 'come'. Such possibilities are not necessarily unique to Japanese. Spanish, for example, employs directional adpositions, which can be stacked within the clause,<sup>2</sup> as well as complex motion predicates.<sup>3</sup> Compound verbs are also seen in other verb-framed languages such as Korean (Slobin 2004b).

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2. Use of directional adpositional phrases in combination with verbs of MANNER of motion in verb-framed languages is argued to be restricted such that they cannot be used for telic events (Aske 1989) or events involving state changing boundary crossing (Slobin and Hoiting 1994). To some extent, Japanese may be similarly constrained, which may explain the ungrammaticality of \**John-ga gakkoo-ni/e hashitta/aruita* 'John walked/ran to school' (Tsujimura 1994, cited in Inagaki 2002:119), although see Inagaki (2002: 191, footnote 11) for comments on variations in native speaker judgments of sentences such as these. However, *John-ga gakkoo-made hashitta/aruita* 'John walked/ran to school' (Inagaki 2002:191) is commonly accepted, which may reflect semantic differences concealed in translation equivalents.
3. In Japanese, Matsumoto (1991; 1996) claims that such complex motion predicates are mono-clausal and contain a motion verb, either MANNER or PATH, with a connective *-te* suffix followed by a main tensed verb. He restricts the verbs that can appear in tensed/final positions in such constructions to deictic motion verbs, e.g., *iku*, 'go'; *kuru*, 'come'; *irassharu*, 'go'; *kaeru*, 'return'.

Basic differences in lexicalization patterns have been argued to have consequences at the level of the clause. In a corpus of literary translations, Slobin (1996b) illustrates possibilities in English and Spanish. He found that English texts tended to encode more information about PATH than Spanish texts through numerous mentions of Ground within individual clauses describing motion.<sup>4</sup>

- (4) *I went into the hall and through to the dining room.*  
*Entré en el hall y pasé al comedor.*  
 'I entered the hall and passed to the dining room'  
 (Du Maurier 1938: 243, cited in Slobin 1996b: 216)

In the English sentence above, there are two Ground elements associated with a single PATH verb (*went + into the hall / through to the dining room*). In Spanish, on the other hand, comparable information is spread across two clauses, each associated with different PATH verbs (*entré + en el hall; pasé + al comedor*).

Slobin hypothesized that, as English generally locates PATH outside the verb root, many more PATH elements (that is, PATH particles and Ground elements expressing trajectory information such as *into the hall*) can be concatenated within a clause, thereby yielding a more extended PATH description. For Spanish speakers to do the same, each PATH expression would require a separate verb clause. And indeed, the analysis of novels revealed that English-speaking writers on average mentioned 2.24 Ground elements in each description of a motion event, in contrast with the 1.52 elements mentioned by Spanish-speaking writers. Thus, although they employed fewer clauses, writers of English ultimately added more PATH detail to their motion event descriptions than their Spanish-speaking counterparts.

These observations lie at the heart of the concept of "thinking for speaking" (Slobin 1996a), that is, the idea that speakers typically attend to the aspects of an event that their language has the readily available linguistic means to express, and that over time, this habitual attention leads to certain rhetorical styles. Thinking for speaking, then, would predict generally compact expression of complex trajectories in English.

The existence of crosslinguistic differences in lexicalization and encoding of PATH have also prompted the question of what happens when indi-

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4. Observations about depiction of Ground and its relationship to PATH here should be distinguished from other observations in the literature regarding descriptions of Ground in the process of 'scene setting', i.e., descriptions of the context in which the motion took place prior to descriptions of the motion itself, which allow information about PATH to be inferred (cf. Slobin 1996b).

viduals acquire knowledge of a competing system, for example, in the case of second language learning. Studies of both intermediate and advanced L2 speakers have found traces of properties from the L1 in L2 production, generally known as “transfer” from the L1. In the domain of PATH expressions, examples of transfer include non-target-like use of PATH verbs, redundant use of PATH satellites, and acceptance of ungrammatical combinations of MANNER and PATH constructions (e.g., Cadierno 2004; Cadierno and Ruiz, 2006; Inagaki, 2001; Navarro and Nicoladis 2005; Negueruela et al. 2004; Stam 2006). Difficulties with such seemingly simple lexical items as *up*, *down*, *enter*, *exit* in English, even at high levels of L2 proficiency, is rather striking.

Although this kind of data overwhelmingly suggests that typologically determined preferences for expression of PATH in the L1 are resistant to change, there is a small body of evidence indicating that patterns may shift in an L1 under the influence of presence of an L2—even during L2 acquisition and in L2 speakers who are not functional bilinguals. To date, studies have focused on MANNER of motion in speech and gesture (Brown and Gullberg, 2008) and gesture perspective in the expression of motion (Brown 2008), but little is known about whether an L2 influence on the L1 can also be found in the expression of PATH of motion.

In sum, given the variety of available morphosyntactic resources in Japanese outlined above, we may question whether Japanese really patterns like other verb-framed languages such as Spanish in terms of preference for expressing one PATH constituent per clause as opposed to concatenating several such expressions within the clause. Moreover, since expression of PATH is moderated by preference rather than governed by grammar in both English and Japanese, there is potential for effects of one language on another in the context of second language acquisition. While effects of the L1 on the L2 have been found in L2 production in this domain, no study has examined concurrent effects of an L2 on the L1 (although see Hohenstein, Eisenberg and Naigles 2006 and Tatsumi 1997 for a discussion of bidirectional crosslinguistic influence in bilingualism in the domain of motion), especially at modest levels of proficiency in the L2.

### **3. This Study**

The aim of this study is twofold. The first goal is to examine the extent to which Japanese conforms to the typical verb-framed pattern in language usage. If it does, monolingual speakers of Japanese should lexicalize PATH primarily in simple, main verbs, which diminish the possibility of stacking expressions within the clause. On the other hand, if speakers make use

of the full range of morphosyntactic resources available in Japanese, e.g., postpositions, compound verbs, and complex motion predicates, they may actually encode more information about *PATH* than speakers of other verb-framed languages, e.g., Spanish, through concatenation of expressions.

The second aim is to test the robustness of typological preferences for expression of *PATH* by investigating whether acquisition of an L2 can influence patterns established in an L1. Since Japanese and English differ typologically in this domain, we observe native speakers of Japanese with knowledge of English as an L2 and compare performance in their native L1 to that of monolingual speakers of each language. If influence of an L2 on an L1 exists and is a normal part of L2 acquisition and not L1 loss, these non-monolingual Japanese speakers are predicted to display properties of English in fully grammatical production in Japanese, for example in lexicalization and concatenation of *PATH*.

#### **4. Methodology**

##### *4.1. Participants*

A total of fifty-seven adults aged between 18 and 48 participated in this study, distributed across four groups: monolingual Japanese speakers resident in Japan (16 speakers), monolingual English speakers resident in the USA (13 speakers), and native Japanese speakers with knowledge of English resident in Japan (15 speakers) or the USA (13 speakers).

Biographical information and information on general language usage was gathered using a detailed questionnaire developed by the Multilingualism Project at the Max Planck Institute for Psycholinguistics (Gullberg and Indefrey 2003). The monolingual speakers of each language had had minimal exposure to an L2, were not engaged in active study of an L2, and did not use an L2 in their everyday lives; therefore, they were considered functionally monolingual. Further, all native Japanese speakers with knowledge of English were engaged in active use of their L2. Crucially, the L2 speakers in Japan had never lived in an English-speaking country, while those in the USA had been residents for between one and two years. This contrast in residence was designed to control for possible effects of L1 loss. Changes in *PATH* expression seen only in the L1 of those in the USA might be explained by attrition of the L1 due to residence in the L2 community. However, similar L1 patterns in both groups would render an explanation based on L1 attrition less likely.

Even though this study is only concerned with L1 production, learners' L2 knowledge was carefully measured to ensure uniform proficiency in

English. Participants first rated their own proficiency in speaking, listening, writing, reading, grammar, and pronunciation. They then completed the first grammar section of the Oxford Placement Test (Allan 1992). Third, their oral proficiency was evaluated by consensus judgment of two certified examiners using the University of Cambridge Local Examinations Syndicate (UCLES) oral testing criteria for the First Certificate in English (FCE).<sup>5</sup> Both the Oxford Placement and the FCE criteria placed the native Japanese speakers with knowledge of English resident in Japan and the USA within intermediate range. The groups did not significantly differ in proficiency as measured by the Oxford Placement Test ( $t(25) = 0.795$ ,  $p = 0.434$ ), but marginally differed in proficiency as measured by the Cambridge FCE criteria ( $t(26) = 1.982$ ,  $p = 0.058$ ), with the learners resident in Japan scoring slightly higher than those resident in the USA.

Participants' biographical and language usage data as well as English proficiency data are summarized in Table 1.

Table 1. *Summary of biographical and language usage/proficiency data*

Language background	Non-monolingual Japanese (Japan) ( $n = 15$ )	Non-monolingual Japanese (USA) ( $n = 13$ )
Mean AoE <sup>a</sup> : English	11.9 (range 9–13)	12.8 (range 12–14)
Mean usage <sup>b</sup> : English	3 hrs (range .5–8.5)	6 hrs (range 1–12)
Mean self-rating <sup>c</sup> : English	2.97 (range 2–4.17)	3.27 (range 1.8–4.3)
Mean Oxford Score	78% (range 60–88%)	75% (range 58–85%)
Mean FCE <sup>d</sup> Score	4.27 / 5 (range 2–5)	3.69 / 5 (range 2.3–5)

<sup>a</sup> Age of exposure; <sup>b</sup> Hours of usage per day; <sup>c</sup> A composite score of individual skill scores;

<sup>d</sup> Cambridge First Certificate in English

#### 4.2. *Stimuli*

Short narrative descriptions were elicited based on the six-minute, animated *Sylvester and Tweety Bird* cartoon, “Canary Row” (Freleng, 1950), used in several studies on expression of motion in speech and gesture (e.g., Kita and Özyürek, 2003; McNeill 1992; Stam 2006; *inter al.*). The cartoon contains numerous motion events, centering around Sylvester's repeated but failed attempts to catch Tweety. In order to get maximal information from participants and increase the likelihood of mention of motion events, the entire cartoon was broken down and shown in

5. More information can be found at <http://www.cambridgeesol.org>.



manageable scenes following McNeill (1992). Two different sequences of scenes were systematically varied in the presentation of the stimulus. From the stimulus material, four motion events consistently described by participants were selected for coding and analysis, yielding four different PATHS: climb THROUGH, roll DOWN, clamber UP, swing ACROSS.

#### 4.3. *Procedure*

All participants narrated in their L1. The native Japanese speakers with knowledge of English also produced narratives in their L2, but only the L1 data are reported here. Note, however, that the language order in which the second language speakers gave descriptions was counter-balanced across participants with a minimum of three days between appointments. This minimized the likelihood of both the L1 and L2 being fully active at the same time, therefore controlling for the effects of “language mode” (Grosjean 1998). Depending on the language of the experiment, participants were tested individually by either a native English- or native Japanese-speaking confederate. The participant and experimenter first engaged in a brief warm-up, consisting of small talk in the target language, in order to put participants in “monolingual mode”. Next, the experimenter told participants that they would be watching a series of animated scenes from a cartoon on a computer screen and should retell what they had seen to the experimenter in as much detail as they could remember. The experimenter was trained to appear fully engaged in the participants’ narratives, but to avoid asking questions and crucially to avoid supplying the target PATH.

#### 4.4. *Speech segmentation and coding*

Narrative descriptions were transcribed from digital video by a native speaker of the relevant language. Descriptions were divided into clauses, defined as “any unit that contains a unified predicate... (expressing) a single situation (activity, event, state),” following Berman and Slobin (1994: 660). Clauses sometimes contained more than one verb. Infinitives or participles functioning as complements of modal or aspectual verbs, for example, were not segmented separately, e.g., [*He wants to go*], and neither were predicates that were narrator comments, e.g., [*I think he went*]. In Japanese, clausal segmentation presented some challenges due to the status of the connector morpheme, *-te*, which can connect a whole series of verbs. Linguists ascribe various semantics to *-te*, which might affect the placement of clausal boundaries (see, for example, Hasegawa 1996; Kuno 1973; Nakatani 2003). Following Kuno (1973) and Nakatani

(2003), in this analysis *-te* was considered primarily a simple connector of temporal sequence. Thus, all such inflected verbs were segmented as individual clauses, with the exception of those occurring in mono-clausal complex motion predicates, defined by Matsumoto (1991; 1996) as consisting of a motion verb, *-te* suffix, and a deictic verb. Examples of clausal segmentation of individual narratives by an English speaker and a Japanese speaker respectively are shown in (5) and (6).

- (5) 1[*okay so Sylvester decides to crawl inside the drainpipe up to the windowsill*]  
 2[*Tweety sees*]  
 3[*him coming*]  
 4[*and puts a bowling ball down the drainpipe*]  
 5[*and it fits*]  
 6[*and it meets Sylvester*]  
 7[*who ends up with a the ball inside of his stomach*]  
 8[*and he runs*]  
 9[*and rolls down the hill with it into a bowling alley*]  
 10[*when you hear a strike*]
- (6) 1[*amamizu-no kou ochiru*]  
 rainwater-Gen like descend  
 ‘(the thing) the rainwater goes down like this’  
 2[*toi-ga arundesukedo*]  
 pipe-Nom exist.but  
 ‘there is a drainpipe’  
 3[*soko-kara naka-ni neko-ga haitte-itte*]  
 there-from inside-to cat-Nom enter.Con-go.Con  
 ‘from there, the cat went inside and’  
 4[*sono hiyoko-no tokoro-made ikouto-shitandesukedo*]  
 that bird-Gen place-to try.to.go-did.but  
 ‘and tried to reach the place where that chick is’  
 5[*hiyoko-wa booringu-no booru-o soko-no toi-ni*  
 bird-Top bowling-Gen ball-Acc there-Gen pipe-to  
*ue-kara otoshite*]  
 up-from drop.Con  
 ‘the chick drops the bowling ball on the drainpipe from the top and’  
 6[*ee sono neko-ga haitteiru*]  
 um that cat-Nom is.inside  
 ‘where that cat is inside’  
 7[*naka-ni otoshitande*]  
 inside-to drop.Con  
 ‘(the bird) dropped (it) inside of (the drainpipe)’

- 8[kou nanka neko-ga sore-o sono booringu-no booru-wo  
like like cat-Nom that-Acc that bowling-Gen ball-Acc  
nonde-shimatte]  
drink.Con-finish.Con  
'something like the cat swallowed that bowling ball and'
- 9[de saka-o kou kudaru-youni]  
and hill-Acc like descend-like  
'and like goes down the slope like this'
- 10[kou ochite-itte]  
like fall.Con-go.Con  
'(the cat) is falling down like this'
- 11[booringu jyou-ga choudo atta-node]  
bowling place-Nom precisely existed-so  
'and there was a bowling alley just there and so'
- 12[soko-ni haitte-shimaimashita]  
there-to enter.Con-finished  
'(he) got in there'

Next, clauses describing the four target motion events were identified and coded using Elan, a digital video tagging software program developed at the Max Planck Institute for Psycholinguistics (Wittenburg et al. 2006). In example (5), clauses 1 and 3 relate to the climb THROUGH event and 8 and 9 relate to the roll DOWN event. In example (6), clauses 3 and 4 relate to the climb THROUGH event, and 9, 10 and 12 relate to the roll DOWN event. Clause 10 illustrates a complex motion predicate, in which two verbs are joined within a single clause, *ochiru* 'fall' and *iku* 'go'.

A coding scheme was employed whereby all lexical elements encoding information about the trajectory followed by the Figure object were coded as PATH, including directional adpositional phrases indicating source and goal of motion and deictic verbs indicating motion. This coding scheme largely followed schemes outlined in previous studies on motion events (e.g., Jensen 2002; Kita and Özyürek 2003; Slobin 1996b, 1997, 2004b; Weingold 1992, 1995)<sup>6</sup>. In addition, the following language-specific guidelines were employed. Morphologically complex words in Japanese composed of a MANNER component and PATH component e.g., *tobi-komu* 'fly-enter.in', or two PATH components, e.g., *toori-nukete* 'go through-come

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6. Although they are included here in order to be inclusive with respect to specification of a trajectory, many coding schemes do not include source, goal or deictic expressions as PATH. Although this may appear controversial, the reader is reminded that the crucial comparisons in this study are within-language for which exactly the same coding scheme was applied.

out' were divided, and each PATH component was coded separately since each part of the lexical compound contributes independently to the meaning of the construction. Complex motion predicates consisting of a progressive motion participle with a deictic motion verb were treated similarly. The Japanese verbs, *hairu* 'enter' and *deru* 'exit', were not coded as motion verbs at all unless they were combined with *kuru* 'come' or *iku* 'go' as auxiliaries or adpositional phrases such as *ni* 'to', following Kita's (1999) claim that these verbs in their bare forms express discrete changes of state without motion semantics (although see Tsujimura 2002, for an alternative analysis of Japanese enter and exit verbs). Furthermore, in Japanese, we excluded all spatial nouns, e.g., *ue* 'top/upness' in *ue-ni agaru* 'rise to the top', as we considered these to encode location more than trajectory. We excluded comparable cases of locative expressions in English, e.g., *climbed on the drainpipe*, *climbed the inside of the drainpipe* unless these were used adverbially to express motion, e.g., *went in/inside/into*.

The first level of analysis investigated lexicalization of PATH. Here, the repertoire of lexical items used and the distribution of PATH semantics across morphosyntactic resources were identified. Two possible morphosyntactic patterns were distinguished in this analysis: verbal and adverbial. The second level of analysis addressed concatenation of PATH by examining the number of PATH expressions of any type per clause.

Examples of analysis of lexicalization and concatenation of PATH in descriptions of the 'roll DOWN' event in Japanese and English appear in (7) and (8), with clause boundaries marked by brackets and PATH expressions underlined.

- (7) [*Neko-wa sakamichi-o korogatte ikimashita*]  
 cat-Top hill-Acc roll.Con went  
 Lit: 'The cat went rolling on the hill'
- (8) [*The ball rolled out of the drainpipe, down the hill and into the bowling alley*]

Example (7) from Japanese contains only one overt PATH expression, a verb, embedded in a complex motion predicate with a MANNER and PATH component: *korogatte iku* 'go rolling'.<sup>7</sup> In example (6) from English, however, there are three PATH expressions, all adverbials: *out*, *down* and *into*.

7. Native Japanese speakers may argue that this utterance contains directional information other than that conveyed by *iku* 'go'. This may be due to the special status of *korogaru* 'roll', which in combination with a Ground phrase, e.g., *saka-o* 'hill-Acc', without a directional particle, may encode implicit directional semantics e.g., *saka-o korogatte* 'roll on/down the hill'. However, since any additional directional information expressing descent in (5) is regarded as implicit, it has not been included in the coding, gloss or translation.

#### 4.5. *Reliability of speech coding*

To establish reliability of data coding, 15% of the entire data set was segmented and coded by an independent second coder. 95% agreement was reached on selection of relevant clauses for coding, and of these, 100% agreement was reached on coding of lexicalization and concatenation. Disagreements were settled by accepting the judgment of the initial coder.

#### 4.6. *Analysis*

Two different analyses were conducted to investigate the expression of PATH in L1 narrative production: first, we identified lexicalization patterns in each group, and second, we assessed concatenation patterns. For all quantitative analyses, the native Japanese speakers with knowledge of English resident in Japan were compared to their counterparts resident in the USA. When no differences were found between them, the data were collapsed to form a single group of non-monolingual speakers. Non-parametric statistical tests were employed throughout, specifically Kruskal-Wallis for multiple group analyses and Mann-Whitney for between group analyses.

### 5. **Results**

#### 5.1. *Lexicalization of PATH*

In order to investigate lexicalization patterns, we first identified the lexical repertoire for PATH expression employed by speakers in each group to describe the four target motion events. Table 2 shows the range of verbal and adverbial PATH types used by monolingual Japanese, non-monolingual Japanese and monolingual English speakers. In this qualitative analysis, native Japanese speakers with knowledge of English resident in Japan are displayed separately from those in the USA in order to balance participant numbers across groups and minimize the likelihood of differences in the size of lexical repertoires arising from simple differences in group size.

As Table 2 shows, all groups employed both verbs and adverbials to lexicalize PATH. However, the differing number of lexical types appearing in each language is a clear indication that lexicalization patterns vary crosslinguistically. As expected, monolingual speakers of English employed a greater variety of adverbial expressions, whereas lexical diversity in both monolingual and non-monolingual Japanese discourse was chiefly observed in verbs. In contrast to clear differences between languages, within-language patterns appeared rather more uniform, regardless of

Table 2. Lexical repertoire for PATH expression

	Mono Japanese n = 16	Non-mono Japanese: Japan n = 15	Non-mono Japanese: USA n = 13	Mono English n = 13
PATH	<i>agaru</i> 'rise'	<i>agaru</i> 'rise'	<i>agaru</i> 'rise'	<i>come</i>
verb	<i>hairu</i> 'enter'	<i>hairu</i> 'enter'	<i>chikazuku</i>	<i>get</i>
types	<i>iku</i> 'go'	<i>idou-suru</i> 'move'	'approach'	<i>go</i>
	<i>komu</i> (only in compound form) 'into'	<i>iku</i> 'go'	<i>hairu</i> 'enter'	
	<i>kudaru</i> 'descend'	<i>komu</i> (only in compound form) 'into'	<i>iku</i> 'go'	
	<i>kuru</i> 'come'	'into'	<i>komu</i> (only in compound form) 'into'	
	<i>noboru</i> 'climb' <sup>8</sup>	<i>kuru</i> 'come'	'into'	
	<i>noru</i> (only in compound form) 'onto'	<i>mezasu</i> 'go toward'	<i>kuru</i> 'come'	
	<i>ochiru</i> 'fall'	<i>mukau</i> 'go toward'	<i>noboru</i> 'climb'	
	<i>shinnyuu-suru</i>	<i>noboru</i> 'climb'	<i>ochiru</i> 'fall'	
	'invade'	<i>nukeru</i> 'go through'	<i>shinnyuu-suru</i> 'invade'	
	<i>tai-suru</i> 'go toward'	<i>ochiru</i> 'fall'	<i>tadoritsuku</i> 'arrive'	
	<i>tooru</i> 'go through'	<i>oriru</i> 'decend'	<i>tooru</i> 'go through'	
	<i>tsutau</i> 'go along'	<i>shinnyuu-suru</i> 'invade'	<i>toutatsu-suru</i> 'arrive'	
	<i>tsutawaru</i> 'go through'	<i>tadoritsuku</i> 'arrive'	'arrive'	
	<i>utsuru</i> 'move'	<i>tooru</i> 'go through'	<i>tsutau</i> 'go along'	
	<i>wataru</i> 'cross'	<i>tsutawaru</i> 'go through'	<i>tsutawaru</i> 'be passed along'	
		<i>utsuru</i> 'move'	<i>utsuru</i> 'move'	
		<i>ugoku/ugokasu</i> 'move/be moved'		
		<i>utsuru</i> 'move'		

8. Japanese linguists (e.g., Matsumoto 1996) consider *noboru* 'climb.ascend' as a PATH verb because it can only encode upwards trajectory (*ue-ni noboru* 'climb up' / *\*shita-ni noboru* 'climb down'), in contrast to its closest translation equivalent in English, *climb*, which is considered a MANNER verb as it can be paired with both upwards and downward trajectories (*climb up* / *climb down*). In Japanese, *noboru* also occupies the position of a PATH verb (second position) in a MANNER-PATH verb compound. However, Sugiyama (2005) discusses the problematic nature of this verb, explaining that it can be represented by three different Chinese characters, only two of which have a clear PATH reading. The third character, she argues, has a much stronger suggestion of MANNER, indicating use of one's hands or feet. Moreover, there is no clear way of knowing which meaning the speaker intended. However, as she observes, the addition of *yojiru* 'clamber' with *noboru* in the compound construction, *yoji-noboru* 'clamber.ascend' more clearly expresses the semantics of MANNER. Thus, all cases of *noboru* have been coded here as PATH.

Table 2. (Continued)

	Mono Japanese n = 16	Non-mono Japanese: Japan n = 15	Non-mono Japanese: USA n = 13	Mono English n = 13
PATH	<i>he</i> 'to'	<i>he</i> 'to'	<i>he</i> 'to'	<i>across</i>
adverbial	<i>kara</i> 'from'	<i>kara</i> 'from'	<i>kara</i> 'from'	<i>along</i>
types	<i>made</i> 'until/to'	<i>made</i> 'until/to'	<i>made</i> 'until/to'	<i>back</i>
	<i>ni</i> 'to'	<i>ni</i> 'to'	<i>massigura</i> 'toward'	<i>behind</i>
			<i>ni</i> 'to'	<i>beyond</i>
				<i>down</i>
				<i>from</i>
				<i>in</i>
				<i>inside</i>
				<i>into</i>
				<i>on</i>
				<i>out of</i>
				<i>over</i>
				<i>through</i>
				<i>to</i>
				<i>up</i>

language experience. There was complete overlap in adverbial types employed by monolingual and non-monolingual Japanese speakers and comparable numbers of verb types with a large degree of overlap. However, in order to fully explore lexicalization patterns given the possibilities for different verb constructions in Japanese, e.g., compound verbs and complex motion predicates, we calculated the number of PATH verbs versus adverbials per clause.

Figure 1 shows the mean number of verbs expressing PATH per clause in all clauses containing PATH information in each language group. As there was no significant difference between the non-monolingual Japanese speakers resident in Japan versus the USA ( $z = -1.322$ ,  $p = 0.186$ ), the data for the two groups were collapsed.

There was a significant difference between the groups in mean number of PATH verbs per clause ( $\chi^2(2, N = 57) = 29.826$ ,  $p < 0.001$ ). Specifically, monolingual English speakers produced significantly fewer PATH verbs per clause than both monolingual Japanese speakers ( $z = -4.572$ ,  $p < 0.001$ ) and native Japanese speakers with knowledge of English ( $z = -5.111$ ,  $p < 0.001$ ), who did not significantly differ from each other ( $z = -0.356$ ,  $p = 0.722$ ).

Figure 2 shows the mean number of adverbials expressing PATH per clause in all clauses containing PATH information. Again there was no sig-

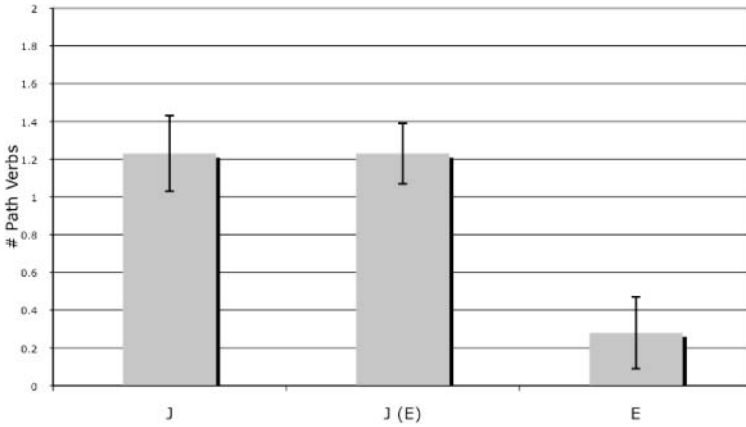


Figure 1. Mean number of PATH verbs per clause: *J* (monolingual Japanese speakers), *J (E)* (*LI* of native Japanese speakers with knowledge of English), and *E* (monolingual English speakers)

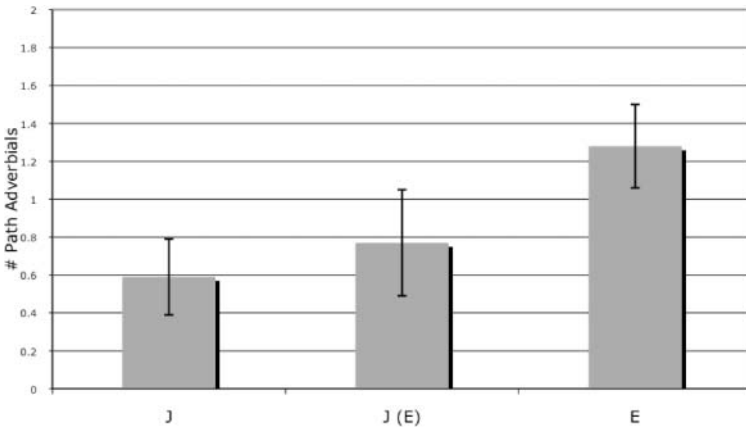


Figure 2. Mean number of PATH adverbials per clause: *J* (monolingual Japanese speakers), *J (E)* (*LI* of native Japanese speakers with knowledge of English), and *E* (monolingual English speakers)

nificant difference between the non-monolingual Japanese speakers resident in Japan versus the USA ( $z = -0.278$ ,  $p = 0.781$ ), so the groups were collapsed.

The groups again differed in mean number of PATH adverbials per clause ( $\chi^2(2, N = 57) = 26.775$ ,  $p < 0.001$ ). This time, monolingual English speakers produced significantly more PATH adverbials per clause



than native Japanese speakers with knowledge of English ( $z = -4.306$ ,  $p < 0.001$ ), who in turn produced marginally significantly more PATH adverbials per clause than monolingual Japanese speakers ( $z = -1.895$ ,  $p = 0.058$ ).

In sum, these results illustrate between-language but also to some extent within-language differences. In line with previous crosslinguistic research showing differences between lexicalization patterns in satellite-versus verb-framed languages (e.g., Gennari et al. 2002; Naigles et al. 1998; Slobin 1996b), the native English speakers observed here lexicalized PATH in a wide range of adverbials, whereas the native Japanese speakers lexicalized PATH in a comparably wide range of verbs. Yet analyses also show that both English and Japanese speakers were not grammatically constrained by their typological classification and expressed PATH in alternative ways. Most striking, however, is the finding that native Japanese speakers with knowledge of English used marginally significantly more adverbials than their monolingual Japanese counterparts, which suggests an influence of knowledge of English. Crucially, given that performance among non-monolingual Japanese speakers did not differ according to their country of residence and lexicalization was fully grammatical, the higher adverbial usage did not appear to arise from loss of the L1.

## 5.2. *Concatenation of PATH*

From the analyses above, we see that Japanese and English speakers employ both verbs and adverbials for lexicalization of PATH. Given that adverbials can be concatenated, this may have repercussions for PATH expression at the level of the clause. Moreover, as noted previously, even stacking of PATH verbs is an available option in Japanese. Example clauses (9)–(13) from descriptions of the ‘climb THROUGH’ and ‘clamber UP’ events demonstrate this range of options in monolingual and non-monolingual Japanese discourse as compared to monolingual English discourse.

- (9) [*Neko-ga amadoi-no naka-o tsutatte*]  
 cat-Nom drainpipe-Gen inside-Acc go.along.Con  
 Lit: ‘The cat goes along the inside of a drainpipe’
- (10) [*Tori-no tokoro-ni ikouto*]  
 bird-Gen place-to try.to.go  
 Lit: ‘(The cat) tries to go to the bird’s place’
- (11) [*Haisuikan-no naka-o toori-nukete*]  
 drainpipe-Gen inside-Acc go.through-go.through  
 Lit: ‘(The cat) goes along going through the inside of the drainpipe’

- (12) [*Chiyou-kara Tweety-no tokoro-made nobotte*  
ground-from Tweety-Gen place-to climb.ascend.Con  
*itta*]  
went

Lit: “(He) went climbing from the ground to Tweety’s place”

- (13) [*And goes rolling down the street into a bowling alley*]

Example (9) from a monolingual Japanese speaker illustrates the typical verb-framed pattern, a clause with one PATH expression in the main verb *tsutau* ‘go along.’<sup>9</sup> Examples (8) and (9) from non-monolingual Japanese speakers with knowledge of English present clauses with two PATH expressions in each: in the first, the verb *iku* ‘go’ and the postposition *ni* ‘to’, and in the second, the compound verb combining *tooru* ‘go through’ and *nukeru* ‘go through’. The example in (10), also from a non-monolingual Japanese speaker, however, contains four PATH expressions in a completely grammatical clause: two postpositions, *kara* ‘from’ and *made* ‘to’, and a complex motion predicate consisting of two verbs, *noboru* ‘climb.ascend’ and *iku* ‘go’. The final example in (11) from a monolingual English speaker contains three PATH expressions: one verb, *go*, one adverb, *down*, and one preposition, *into*.

These examples demonstrate clearly that with the full range of morpho-syntactic devices, Japanese speakers can concatenate PATH expressions grammatically within the clause as easily as English speakers can. The remaining question is whether they actually do. Figure 3 shows the mean number of PATH expressions of all types (verbs and adverbials) per clause in all clauses containing PATH information in each language group. Once again, there was no significant difference between the non-monolingual Japanese speakers resident in Japan versus the USA ( $z = -0.723$ ,  $p = 0.470$ ), so the data for the two groups were collapsed.

There was a significant difference between the groups in mean number of PATH expressions per clause ( $\chi^2(2, N = 57) = 16.193$ ,  $p < 0.001$ ). Native Japanese speakers with knowledge of English stacked significantly more PATH expressions per clause than monolingual Japanese speakers ( $z = -2.010$ ,  $p = 0.044$ ), who packed significantly more PATH expressions per clause than monolingual English speakers ( $z = -2.079$ ,  $p = 0.038$ ).

In sum, results on concatenation of PATH expressions within the clause revealed surprising between- and within-language differences. First, not only did speakers of Japanese in general stack more PATH expressions per clause than would be expected from a verb-framed language, but they

9. The spatial noun *naka* ‘inside’ was not coded as PATH in Japanese for reasons outlined in the section on coding of speech.

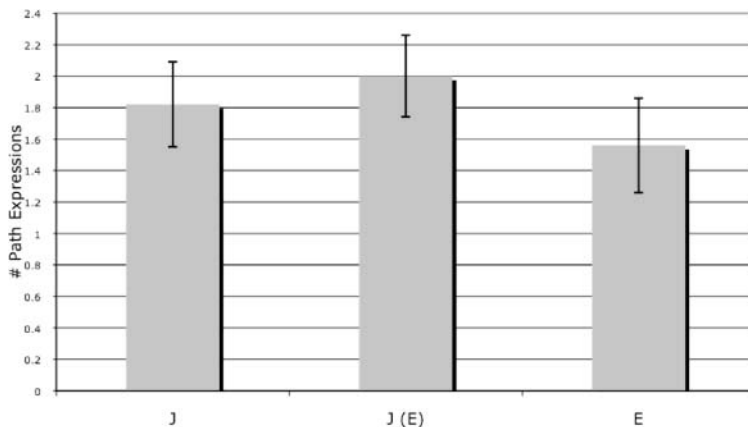


Figure 3. Mean number of PATH expressions of all types per clause: *J* (monolingual Japanese speakers), *J (E)* (L1 of native Japanese speakers with knowledge of English), and *E* (monolingual English speakers)

also packed significantly more PATH expressions per clause than monolingual speakers of a satellite-framed language, English. Second, in their L1, Japanese speakers with intermediate knowledge of English concatenated significantly more PATH expressions per clause than their monolingual Japanese counterparts. Again, there was nothing ungrammatical about non-monolingual L1 production, as can be seen in examples (7)–(10), and non-monolingual speakers in the USA patterned in the same way as those in Japan, implying that this pattern was not the result of L1 loss.

## 6. Discussion

This study investigated the robustness of typological preferences for PATH expression by examining (1) the extent to which expression of PATH in Japanese follows patterns demonstrated in other verb-framed languages with respect to lexicalization and concatenation, and (2) whether patterns in an L1 can change after acquisition of an L2.

Regarding the first research question, analyses of monolingual expression of PATH both confirm and challenge previously found typological differences in lexicalization patterns. In line with previous research, monolingual Japanese speakers encoded PATH primarily in a wide range of verbs, whereas monolingual English speakers encoded PATH primarily in a wide range of adverbials. However, the full range of morphosyntactic devices available in Japanese meant that monolingual speakers of this

verb-framed language were not restricted to the one PATH expression per clause seen in other verb-framed languages and instead concatenated significantly more PATH expressions than monolingual speakers of a satellite-framed language, English.

Important to note, however, are differences in the semantics of PATH expressions used. In English, adverbials can encode all components of a trajectory—the source, the goal and the intervening movement. Therefore, the stacking of adverbials within a clause, e.g., *down the street into a bowling alley*, can actually encode separate trajectories within a journey. In Japanese, on the other hand, adverbials only encode the source and goal of a trajectory. Hence, the stacking of adverbials, e.g., *chiyou-kara Tweety-no tokoro-made* ‘from the ground to Tweety’s place’, only encodes different components of a single trajectory, specifically the starting and ending points. Thus, with a greater stacking of PATH expressions, native Japanese speakers were not necessarily encoding more complex trajectories within a clause than native English speakers, just greater specifications of a single trajectory.

In addition to these semantic differences, methodological differences between this and prior studies might help account for the disparity between Japanese and other verb- or satellite-framed languages. For example, there is variation between studies in the number and nature of motion events described, and similar patterns may not hold for all motion events. Indeed, Matsumoto (p.c.) suggests that some of the motion events analyzed in this study may not have involved a journey complex enough to elicit maximal concatenation of PATH expression in English speech. Moreover, there also may have been differences in the biographical profiles of participants. Data in previous studies came from “native” speakers of the languages, who may or may not have had varying degrees of proficiency in another language, whereas the “monolingual” participants employed in the current study were carefully selected on the basis of their limited foreign language experience. With the results of this study indicating that use of one’s L1 can be subtly altered with even intermediate proficiency in an L2, it becomes crucial to control for second language knowledge in any investigation of the “native” speaker baseline.

The above differences in semantics and methodologies notwithstanding, the fact remains that the existence of postpositions as well as compound verbs and complex motion predicates allow Japanese speakers to concatenate PATH expressions to a surprisingly high degree. Furthermore, we must keep in mind that since speakers of satellite-framed languages typically reserve the verb slot for a MANNER verb and have few options for compound MANNER-PATH verbs, adverbials offer the best option for accumulation of PATH expressions. In short, it may not have been the

monolingual English speakers in this study who patterned differently from native English speakers in previous studies, but the monolingual Japanese speakers who did not pattern in a way generally predicted for speakers of verb-framed languages. This supports findings from at least one other verb-framed language, Basque, which also pays a lot of attention to source and goal of PATH in a range of morphosyntactic devices, and thus behaves rather like a satellite-framed language (Ibarretxe-Antunano 2004). We conclude that in contrast to previous claims, typological classification does not necessarily restrict concatenation of PATH information within the clause. Moreover, these findings highlight the importance of distinguishing between what a language allows and what speakers of that language actually do.

Regarding the second research question, L1 preferences for PATH expression do not appear to be impervious to change. Native Japanese speakers with intermediate knowledge of English employed a mixed strategy for PATH lexicalization in their L1, Japanese, with frequent use of both verbs, like their monolingual Japanese counterparts, but also adverbials, like monolingual English speakers. These same speakers then produced the most greatly specified trajectories of all, with significantly more PATH expressions per clause than either monolingual group.

These results suggest that established typological patterns in the L1 might be influenced by patterns being acquired in the L2, even at intermediate levels of L2 proficiency. More specifically, non-monolingual speakers of Japanese with some knowledge of English appear to combine both Japanese and English lexicalization strategies for expression of PATH in their L1. In all likelihood, this strategy accounts for the highly specified and compact encoding of PATH, since a combination of verbs and adverbials can be easily stacked within the clause. Importantly, as there were no differences between Japanese speakers residing in the L1 versus the L2 community and as increased L1 expression of PATH was completely grammatical, these results do not seem to indicate any kind of language loss. Instead, in this arena, characterized by linguistic preference as opposed to grammaticality, such patterns suggest a fully grammatical process of convergence between the L1 and L2, much as has been proposed for the linguistic systems of bilinguals (e.g., Bullock and Toribio 2004; Colantoni and Gurlekian 2004; Montrul 2004; Sanchez 2004; Tatsumi 1997).

If the patterns observed here do reflect the effects of acquisition of L2 English on use of L1 Japanese, the nature of the influence is rather more complicated than a simple matter of translation. As noted above, directionals function differently in English and Japanese. For example, the Japanese equivalent of the English adverbial *up*, which does not

specify an end point, would be *ue-ni* ‘to the top/upness’, which specifies a spatial noun as the goal of motion. Therefore, in using comparable morphosyntactic resources as an English speaker to lexicalize PATH, a non-monolingual speaker of Japanese communicates slightly different semantic information, e.g., the source and goal of motion as opposed to the intervening trajectory.

These findings have several theoretical and methodological implications. First, with respect to linguistic typology, monolingual baseline results reveal that the relationship between typology and discourse is not as simple as has been predicted, and that there is still a need for further empirical testing in a wider range of languages of predictions for language usage on the basis of typological distinctions. Furthermore, multilingual results suggest that studies of language usage should consider the impact of individual language experiences, particularly with respect to second languages as common as English, the effects of which might be seen across entire groups of speakers. Moreover, the synchronic changes observed here may offer predictions for more systemic diachronic shifts, for example of the kind seen after language contact between speech communities (see Slobin 2004b for a discussion of the impact of German on Italian in the domain of motion event language).

Second, in the field of second language acquisition, the relationship between a first language and a second is generally considered to be unidirectional with features of the L1 influencing the L2. However, we argue instead that the relationship may be bidirectional with features of the L2 concurrently influencing the L1. While this has long been acknowledged in the functional bilingualism literature, where proficiency levels in both languages are high (e.g., papers in Cook 2003; Dussias 2001; Hohenstein et al. 2006; Pavlenko and Jarvis 2002), effects of an L2 even at intermediate levels of proficiency on a supposedly stable L1 question the validity of benchmarks used in research on and assessment of second language acquisition. L2 production is typically compared to and assessed against that of a native speaker, whose established language is seen as a ‘fixed target’. The stability, unity and invariability of this standard is likely to be an over-simplification (cf. Davies 2003). If another language, however imperfectly mastered, also influences the native language, this suggests that the native L1 is not an invariable entity, but rather a ‘moving target’. For this reason, we should be more wary of the term “non-target-like” in regard to L2 production. As a consequence, we may then have reason to question findings on the limits on ultimate attainment in an L2 (cf. Birdsong 2005).

In conclusion, this paper argues that expression of PATH in monolingual Japanese does not completely follow patterns established in other

verb-framed languages and that encoding of PATH in the L1 may change after even partial acquisition of an L2. We need more usage data in a range of languages in order to fully explore typological preferences and their effects on discourse. We also need data from other L1–L2 pairings in order to distinguish more clearly between patterns arising from convergence of knowledge of particular languages and those arising from general effects of bilingualism. Much work thus remains to be done. Nevertheless, at this point we may conclude that although the linguistic expression of PATH exhibits considerable crosslinguistic differences among monolingual speakers, it does not seem to be as robust as expected and impervious to change.

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