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GRADUATE SCHOOL OF ARTS AND SCIENCES

Dissertation

**CROSSLINGUISTIC INFLUENCE IN FIRST AND SECOND LANGUAGES**  
**CONVERGENCE IN SPEECH AND GESTURE**

by

**AMANDA BROWN**

B.A., York University, 1992  
M.A., Essex University, 1997

Submitted in partial fulfillment of the  
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First Reader



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Shanley Allen, Ph.D.  
Associate Professor of Education  
Boston University

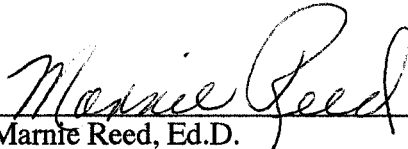
Second Reader



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Marianne Gullberg, Ph.D.  
Scientific Staff Member  
Max Planck Institute for Psycholinguistics

Third Reader



---

Marnie Reed, Ed.D.  
Assistant Professor of Education  
Boston University

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**CROSSLINGUISTIC INFLUENCE IN FIRST AND SECOND LANGUAGES**  
**CONVERGENCE IN SPEECH AND GESTURE**

(Order No.                    )

**AMANDA BROWN**

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Major Professor: Shanley Allen, Associate Professor of Education

**ABSTRACT**

Research on second language acquisition typically focuses on how a first language (L1) influences a second language (L2) in different linguistic domains and across modalities. This dissertation, in contrast, explores interactions between languages in the mind of a language learner by asking 1) can an emerging L2 influence an established L1? 2) if so, how is such influence realized? 3) are there parallel influences of the L1 on the L2?

These questions were investigated for the expression of Manner (e.g. climb, roll) and Path (e.g. up, down) of motion, areas where substantial crosslinguistic differences exist in speech and co-speech gesture. Japanese and English are typologically distinct in this domain; therefore, narrative descriptions of four motion events were elicited from monolingual Japanese speakers (n=16), monolingual English speakers (n=13), and native

Japanese speakers with intermediate knowledge of English (narratives elicited in both their L1 and L2, n=28). Ways in which Path and Manner were expressed at the lexical, syntactic, and gestural levels were analyzed in monolingual and non-monolingual production.

Results suggest mutual crosslinguistic influences. In their L1, native Japanese speakers with knowledge of English displayed both Japanese- and English-like use of morphosyntactic elements to express Path and Manner (i.e. a combination of verbs and other constructions). Consequently, non-monolingual L1 discourse contained significantly more Path expressions per clause, with significantly greater mention of Goal of motion than monolingual Japanese and English discourse. Furthermore, the gestures of non-monolingual speakers diverged from their monolingual counterparts with differences in depiction of Manner and gesture perspective (character versus observer). Importantly, non-monolingual production in the L1 was not ungrammatical, but simply reflected altered preferences. As for L2 production, many effects of L1 influence were seen, crucially in areas parallel to those described above.

Overall, production by native Japanese speakers who knew English differed from that of monolingual Japanese and English speakers. But L1 and L2 production within non-monolingual individuals was similar. These findings imply a convergence of L1-L2 linguistic systems within the mind of a language learner. Theoretical and methodological implications for SLA research and language assessment with respect to the 'native speaker standard language' are discussed.



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### List of Abbreviations

Acc	Accusative case
Comp	Complementizer
Con	Connective
E	English
E (J)	Japanese learners of English in L2 English
Gen	Genitive case
J	Japanese
J (E)	Japanese learners of English in L1 Japanese
L1	First / native language
L2	Second language
M	Manner of motion
Mim	Mimetic
Nom	Nominative case
P	Path of motion
SD	Standard deviation
SLA	Second language acquisition
Top	Topic marker

## Chapter 1: Introduction

### 1.1 Introduction

For most of us, learning a second language (L2) is typically less successful than learning our first language (L1). After roughly half a century of research, the field of second language acquisition (SLA) has identified a number of critical factors that affect the complex process of second language acquisition (e.g. social context, quantity and quality of input, linguistic universals, age, motivation, etc.). One area that has received an enormous amount of attention is the role of the previously learned and typically dominant language, with the idea that features of the native language system to a large extent shape features of a second language system.

The importance attached to the native language construct does not stop with explanations of second language learning; in any kind of assessment, either for research or educational purposes, a second language is typically measured relative to a native language. Davies goes as far as to say,

*“SLA research has always been more interested in the native speaker than in language proficiency. In particular it has compared native-speaker behavior and that of various second language learners, asking the question: What does the second language learner know and to what extent does this differ from what the native speaker knows?”* (Davies, 2003:180)

In most SLA research, the primacy of the native speaker has rarely been questioned. While variation exhibited in second language production is perceived in

terms of deviation from the “ideal”, variation exhibited in first language production is perceived as simply that, variation. As a consequence of this belief and focus, the relationship between the first and second language systems has overwhelmingly been viewed from a unidirectional perspective. The logical possibility that a relationship between the systems could actually be bidirectional has played little or no role in the majority of research questions posed in SLA. Indeed, until fairly recently, it was not even clear why it might be important to probe both sides of this relationship. More specific implications of addressing such a question will be discussed in section 1.4, but in very general terms, we cannot claim to understand the relationship between an established and an emerging language if we only look at half of the picture.

## **1.2 Central research questions**

This dissertation aims to characterize the relationship between linguistic systems in the multilingual mind, by investigating the possibility of a bidirectional relationship between an established first language and an emerging second language within a group of individual learners. The framework employed to address the research question is that of ‘crosslinguistic influence’ (Kellerman & Sharwood Smith, 1986). Adopting such a framework means that the very general research question posed above should be divided into three more specific questions: 1) Can an emerging L2 influence an established L1? 2) If so, how is such influence realized? 3) Within the same group of speakers, are there parallel influences of the L1 on the L2?

These research questions are undertaken within a model of multilingualism that combines two fairly similar theoretical positions. The first is Grosjean's (1982) notion that the linguistic systems of a bilingual will qualitatively differ from those of monolinguals, such that a bilingual should not be expected to resemble two monolinguals in one. The second is Cook's (1991; 1992) concept of "multicompetence", in which multilinguals will exhibit multiple competencies in their languages that differ from those exhibited by their monolingual counterparts. The thesis extends these models by applying them to learner as opposed to bilingual data, and aims to show that the L1 of even a learner of a second language may be qualitatively different from the L1 of a monolingual.

In order to address these issues, four different kinds of data are needed. First, data from monolingual speakers of the source and target languages are required in order to establish the monolingual baseline. Second, learner data are required, but these should consist of data both in the source language (L1) and the target language (L2). The composition of such a corpus will enable three main comparisons. First, L1 data from learners can be compared to monolingual source (intra-language) and target (inter-language) data. Second, L2 data from learners can be compared to monolingual target (intra-language) and source (inter-language) data. These comparisons will address the issue of crosslinguistic influence in both directions. Finally, L1 and L2 data from the same group of learners can be compared in order to address the issue of the interaction between languages in the multilingual mind.

## **1.3 General approach**

### **1.3.1 Speech**

Crosslinguistic influence, particularly the effects of an L1 on an L2, can be and has been studied in comprehension and production, both domains that have yielded a wealth of interesting results. The general approach employed in this thesis is to examine production, specifically oral production. This domain has been selected for three reasons. Although we are interested in effects of an L1 on an L2, the traditional line of enquiry, our greater focus lies in the under-studied reverse direction of influence, i.e. whether and how an L2 can influence the L1. Given that this is rather exploratory work and we expect the phenomenon, if it exists at all, to be fairly subtle, it would seem more appropriate to cast a wide net by eliciting data that is to some extent unconstrained, i.e. production rather than comprehension data. Furthermore, although free production could include written data, oral data is considered potentially more revealing here since it represents rather raw output, which may not be subsequently modified and may therefore be more reflective of online interaction between language systems. The third motivation for employing oral production data is that in addition to analyses of speech, we can employ analyses of gesture as an additional tool with which to identify potential interactions between language systems in the mind of a language learner.

### 1.3.2 Gesture

While use of gesture data is a relatively new methodology in the field of second language acquisition (for recent overviews of why one might be concerned with gesture in a second language, see Gullberg, 2006), the study of non-verbal behavior is not new and has a history spanning centuries (for a historical overview, see Kendon, 2004). In the last half century, an emerging field of gesture studies has defined gesture more narrowly as the "movement of hands and arms that we see when people talk" (McNeill, 1992:1). This field distinguishes gestures from other less communicative physical behaviors such as posture, grooming, and manipulation of objects, and at the same time identifies a range of movements, which can all be subsumed under the heading of 'gesture'. These movements are characterized in terms of various structural features, with a central property, known as the "stroke," distinguished from "preparation" and "retraction" phases (Kendon, 1972).<sup>1</sup>

Gestures have been described as varying along a series of dimensions known as Kendon's continua (Kendon, 1988; McNeill, 1992). One of the dimensions underlying the continua is degree of conventionality, which is inversely related to another dimension, that of accompanying speech. On one side of the continua lie the most conventionalized gestures, which wholly replace speech and are considered languages in their own right, i.e. sign languages. Further along the continua lie other conventionalized gestures, i.e. "emblems", such as the "OK" gesture produced with the thumb and forefinger linked to form a circle. These are recognized within particular

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<sup>1</sup> Structural properties of gestures will be discussed in more detail in Chapter 3, where they are used for the purpose of gesture coding.

speech communities and can be produced without accompanying speech, although they are typically embedded in oral discourse. At the opposite end of the continua lie the less conventionalized, largely idiosyncratic gestures, often referred to as ‘gesticulation’, which are tightly linked to accompanying speech, such that both simultaneously form a combined message (Kendon, 1972; McNeill, 1992). Despite general agreement on the idea that a complementary message is conveyed by speech and gesture particularly in the case of gesticulation, opinions on issues such as the actual function of gesture as well as the nature of its production vary immensely. Questions discussed include the communicative value of gesture (e.g. Kendon, 1994, versus Krauss, Chen & Chawla, 1996) and underlying models of gesture production (e.g. Krauss, Chen and Gottesman, 2000; McNeill, 1992; Kita & Ozyurek, 2003; and De Ruiter, 2000).

In a study of crosslinguistic influence, one could potentially focus on any category of gesture. With striking crosslinguistic variation documented in numerous surveys, emblem gestures might be considered the best place to start.<sup>2</sup> For example, evidence of use of L1 emblems in L2 production would constitute a clear gestural parallel to crosslinguistic lexical borrowing. This thesis, however, will not focus on emblem gestures for three reasons. First, such an obvious manifestation of crosslinguistic influence, while possible in L2 production, might be less expected in L1 production due to the expectation that influence of an L2 on an L1 will be subtler. Second, it is unclear whether learners at the proficiency level examined here would

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<sup>2</sup> See Johnson, Ekman & Friesen (1981), for an inventory of American emblems; Santos (1974), for emblematic Brazilian gestures; Sparhawk (1981), for common emblems in the Middle East; Morris (1977), for a contrastive comparison of emblem gestures used in Europe; and Creider (1977), for a comparison of emblems in Kenyan languages, to name but a few of the surveys of emblem gestures.



even have acquired any emblem gestures in their L2 that might transfer to their L1. Finally, while emblem gestures are clearly not rare, they are much less common than the idiosyncratic gestures that typically accompany spoken interaction. Thus, we would likely need a truly enormous corpus in order to obtain sufficient numbers of relevant gestures from which to draw any conclusions, an option which cannot be taken for obvious practical reasons.

This thesis is generally concerned with the class of idiosyncratic gestures often labeled ‘gesticulation’. McNeill (1992) divides this category into five components, which are not mutually exclusive: (1) *beats* - short, rhythmic movements used to reflect supra-segmental organization of discourse; (2) *deictics* - pointing gestures pinpointing concrete or abstract referents; (3) *metaphorics* - gestures which represent abstract concepts; (4) *iconics* - gestures which bear resemblance to the semantic content of speech; and (5) *cohesives* - repetitions of (1) to (4) which make discourse cohesive, for example the repetition of a particular gesture after an interruption. We will focus specifically on iconics, metaphorics, and deictics, subsumed under the heading of *representational* gestures (Kita, 2000), for reasons outlined below.

Representational gestures are generally assumed to be semantically and temporally coordinated with speech (Kendon, 1993; McNeill, 1992; McNeill, Levy, & Pedelty, 1990; Schegloff, 1984). Regarding semantic coordination, information encoded in representational gestures can mirror that encoded in accompanying speech, highlight certain parts of the spoken utterance, or even add additional information not present elsewhere in the discourse. Regarding temporal alignment, production of

representational gestures will typically be aligned with the most semantically relevant part of the utterance, determined conceptually as opposed to lexically (De Ruiter, 2000). An example of the link between speech and accompanying gesture is shown in (1). Here the beginning and end of the movement, the preparation and retraction, is indicated by parentheses and the central part of the gesture, the stroke, is highlighted in bold.

(1) *he grabs a big oak tree (and he **bends it way back**)*

Gesture preparation: hands are raised to eye level from a resting position on the arms of a chair, forming a grip shape at the same time

Gesture stroke: hand appears to pull something backwards and downwards

(Gesture retraction: not described in original)

(adapted from McNeill, 1992:25)

In example (1), the gesture conveys part of the message encoded in speech. Moreover, the gesture is deployed at roughly the same time as the maximally relevant part of the utterance. Therefore, the gesture-speech unit is conceptually co-expressive.

With such a tight semantic and temporal relationship to speech, representational gestures have been auspiciously labeled as an additional ‘window onto the mind’ (McNeill, 1992), and recent research does suggest they can offer insights on underlying structural, semantic and conceptual representations that might be masked by speech. These conclusions have generally been made with regard to L1 discourse, but Gullberg (2006) argues convincingly that the same is true for second language discourse. She distinguishes “the second language acquisition of gesture” from “gesture in second

language acquisition”. In other words, although gesture can be viewed as another component of the second language that learners have to acquire, analysis of gesture may concurrently enable observation of the way in which the second language is acquired and processed, and crucially how first and second languages interact within individual minds. Here, then, we have a method that may be sensitive enough to uncover the subtleties of crosslinguistic influence, in particular influences of a second language on a first.

In sum, the use of both speech and representational gesture as investigative tools will address the question of crosslinguistic influence more deeply and reveal a more accurate picture of the relationship between language systems in language learners. However, in order to probe this relationship, we need a test domain with sufficient crosslinguistic differences to make crosslinguistic influence in speech and gesture production actually visible. As Odlin states, “[t]he study of transfer depends greatly on the systematic comparisons of languages provided by contrastive analyses” and that “[t]he essential criteria for sound contrastive analyses are easy enough to state, but the development of comparisons based on those criteria has proved to be difficult” (Odlin, 1989:28). Yet as noted later in his volume, there is a subdivision of linguistics where we may find the rigorous exploration of inter-lingual contrasts that we need for an effective investigation of crosslinguistic influence, and that is the field of language typology. The following section provides a brief overview of a domain ideally suited for our purpose and therefore selected as the testing ground for the crosslinguistic influence investigated in this thesis: the domain of motion.

### 1.3.3 Motion events

"The task of locating something in space is something we do as frequently as once every second." (MacWhinney, 1997:122) In the 1980s, Leonard Talmy initiated a new line of semantic inquiry, the lexicalization of spatial terms, which has become one of the most widely investigated areas in lexical semantics. All languages have some way of depicting spatial location and motion, and much crosslinguistic work has been done on these areas. Kita (1999) summarizes the importance of this investigation, citing its potential for illuminating the universal versus the language-particular in such a fundamental area of human cognition.

In 1985, Talmy's main interest lay in the relationship between semantic meaning and surface form, and his initial observation was that the relationship is often not one to one. He decomposed motion events into four main semantic components, which he claimed were present in all languages in some form or another: a "Figure", defined as the object involved in the event; "Ground", defined as the reference object for the Figure; "Path", defined as the trajectory followed or site occupied by the Figure; and finally, "Motion", defined as the fact or existence of motion or location. He further divided Motion into "Manner of Motion", referring to how the Motion occurred, and "Cause of Motion", referring to why the Motion occurred. In the following example, each component of a motion event is identified.

(2)	<i>The pencil</i>	<i>lay</i>	<i>on</i>	<i>the table.</i>
	Figure	Motion (Manner)	Path	Ground
	<i>The pencil</i>	<i>rolled</i>	<i>off</i>	<i>the table.</i>
	Figure	Motion (Manner)	Path	Ground
	<i>The pencil</i>	<i>stuck</i>	<i>on(to)</i>	<i>the table.</i>
	Figure	Motion (Cause)	Path	Ground
	<i>The pencil</i>	<i>blew</i>	<i>off</i>	<i>the table.</i>
	Figure	Motion (Cause)	Path	Ground

(Talmy, 1985:61)

In the examples above, Manner of Motion is expressed in *lay* (location) and *rolled* (motion), and Cause of Motion is expressed in *stuck* (location, caused by glue) and *blew* (motion, caused by the wind).

Talmy focused his analysis on verb roots in order to facilitate crosslinguistic comparison. Using combinations or 'conflation' of the components of a motion event as expressed in verb roots, he proposed a three-way typology of lexicalization, which is outlined below.

1. Conflation of Motion + Manner/Cause: Chinese and all Indo-European languages (with the exception of Romance) are cases of this language type. In English, for example, one can find instances of Motion (location) conflated with Manner, e.g. *lean* and *hang*, though these are slightly rarer than the instances of Motion (movement) conflated with Manner, e.g. *bounce*, *slide*, *roll*, or Cause, e.g. *blow*, *push*, *throw*. In these languages, Path is likely to be expressed in what Talmy refers

to as a “satellite”, otherwise known as a particle, e.g. *up, down, around*, etc. in a syntactic constituent with the verb. The term satellite is preferred over particle in order to capture the crosslinguistic similarities in the expression of Path.

2. Conflation of Motion + Path: Polynesian, Semitic and Romance languages are cases of this language type. In Spanish, examples include *salir* ‘move out’, *entrar* ‘move in’, *subir* ‘move up’. While English does have a small set of verbs of this type, e.g. *descend* and *ascend*, most of them are borrowings from Latin representing a more formal register and are not characteristic of English. In languages of type 2, Manner or Cause of Motion may be expressed as an adjunct to the verb, e.g. *rodando* ‘rolling’. However, Talmy hypothesized that this might be a little awkward at times, and that the semantic component of Manner might therefore be omitted.
3. Conflation of Motion + Figure: Atsugewi is a case of this language type. In these languages, the verb incorporates the semantics of movement or location and the object moving or being located. One of the more interesting examples from Atsugewi is the verb root *-staq-* meaning the movement or location of “runny, icky material” (Talmy, 1985:73). Talmy noted that English does have a few examples of this type of verb root, e.g. *rain* and *spit*.

In later work, Talmy (1991; 2000a; 2000b) proposed the notion of “framing”. Claiming that Path was essentially the “core schema” of a motion event taking the Figure to its Goal, Talmy characterized languages as either “verb-framed”, with core trajectory reflected in the verb, or “satellite-framed”, with core trajectory reflected in

the satellite (verb particle). This taxonomy is reflected in the examples below from Spanish (verb-framed) and English (satellite-framed).

- (3) *La botella entró a la cueva (flotando)*  
 the bottle moved-in to the cave (floating)

‘The bottle floated into the cave’

(Talmy, 2000b:49)

- (4) *The rock rolled down the hill*

(Talmy, 2000b:30)

Since its inception, Talmy’s typology has been enormously influential, inspiring much research. This has led to an increasingly fine-grained understanding of how different languages construe motion, in particular the realms of Path and Manner, which comprise the focus for this thesis. As a result, we have a domain with the requisite systematic comparisons of languages and knowledge of inter-lingual contrasts necessary for an effective investigation of crosslinguistic influence in SLA.

In terms of acquisition of a second language, substantial crosslinguistic variation within the domain of motion events makes the interface between syntax and semantics in the expression of Manner and Path in English a potentially problematic area for language learners. On one hand, learners must acquire the necessary lexical items. In many cases, these are not difficult. Path expressions, *up* and *down* for instance, feature in the earliest stages of first language acquisition (Choi & Bowerman, 1991). Some Manner terms such as *jump* and *roll* may be considered almost as common. The greater challenge, then, is the need to acquire the syntactic configurations

of these elements. This issue is particularly true for learners of English where both verb-framed and satellite-framed constructions are equally grammatical, but the latter is typologically preferred.

More important, however, is that since the typology describes preferences in languages as opposed to grammatical constraints, exposure to differing preferences arising from the learning of a second language may shift the preferences learners exhibit when talking about motion in their first language. Moreover, such shifts in preferences, which may be subtle, are not the kinds of things one would immediately notice in L1 production. What is needed, therefore, is a rigorous quantitative analysis to reveal aspects of crosslinguistic influences that may be taking place.

#### **1.4 Broad implications of this thesis**

The primary goal of this thesis is to gain an understanding of what happens to linguistic systems when they are in contact within a single mind. Specifically, we want to know whether and how a first language can be shaped by the presence of a second language, and if this is in the very same areas that a second language is shaped by the presence of a first language. Evidence for these phenomena within a given linguistic domain will speak to the issue of possible interactions between linguistic systems: areas of convergence and areas of differentiation.

As stated previously, findings showing effects of an L1 on an L2 have theoretical and pedagogical implications for the field of second language acquisition, as



they will contribute to our growing understanding of forces that determine the process of acquisition of a second language, which may in turn help in the language classroom.

Findings showing effects of an L2 on an L1 have different implications, but these are also clearly relevant for the field of SLA. First, with the exception of the effects of aging, the mature L1 is typically considered stable or even static. If it can be shown that an L1 changes under the influence of an L2, then we need a more dynamic notion of the L1. Hence, we would have further reason to question the notion of the native speaker “standard” (cf. Davies, 2003), a standard which is used to *explain* second language acquisition, but also to *measure* it. As Birdsong (2005) argues, a major difference between the fields of bilingualism and second language acquisition is that in bilingual production, variation from monolingual production is considered a normal part of being bilingual; however, in learner production, similar variation reflects a “deficit” in learning. If variation in the L1 of individuals who learn a second language is not viewed in terms of a “deficit”, then in fairness, at least to some extent neither should variation in their L2; although, of course, variation in the L2 is expected to be greater than that seen in the L1.

These findings would in turn have implications for research methodology in second language acquisition. If the L1 system of even an intermediate language learner is qualitatively different from the linguistic system of a monolingual speaker of the source language, it becomes less meaningful to compare the L2 system of a language learner to the linguistic system of a monolingual speaker of the target language, particularly in regard to the issue of ultimate attainment in an L2. While such

comparisons could certainly be made, we must be careful about what they actually tell us. To be more informative about the outcomes of second language acquisition, comparisons between the linguistic systems of learners and those of bilinguals would be more appropriate. Finally, these results would have pedagogical implications for language assessment. Given a difference between multilingual and monolingual systems, it becomes less reasonable to use monolingual language production as a benchmark for multilingual language production, specifically in the L2.

### **1.5 Organization of the thesis**

After the introduction to the theoretical framework and general research questions given here, Chapters 2 and 3 supply the necessary background information for the subsequent studies. In Chapter 2, a survey of research relevant to the general theoretical questions is provided. Included are reviews of studies on crosslinguistic influence in second language acquisition, taking both directions of influence into consideration, as well as mention of crosslinguistic influence in bilingualism. Chapter 3 outlines the methodology employed in this study, covering areas such as participants, stimuli, experimental procedure, and treatment and analyses of speech and gesture data.

Chapters 4, 5 and 6 comprise three separate studies, all conducted within the domain of motion event construal and all examining the question of crosslinguistic influence. Chapter 4 deals with expression of Path of motion. First, previous studies motivating specific predictions are outlined, and then results of analyses of monolingual and non-monolingual L1 and L2 speech and gesture are explained and

interpreted. Chapters 5 and 6 follow the same outline as Chapter 4, with Chapter 5 focusing on expression of Manner of motion and Chapter 6 focusing on combinations of Manner and Path in monolingual and non-monolingual speech and gesture.

A general discussion is presented in Chapter 7. This discussion summarizes results from the three individual studies, highlighting similarities and differences, and draws general conclusions regarding crosslinguistic influence and the interaction between language systems within the mind of a learner. The chapter ends with specific implications of this thesis, its limitations, and suggestions for future research.

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## **Chapter 2: Crosslinguistic Influence in Multilingual Language**

### **Systems**

#### **2.1 Introduction**

The term “crosslinguistic influence”, defined as “the interplay between earlier and later acquired languages” (Kellerman & Sharwood Smith, 1986:1) is employed here as a framework within which to examine the interaction between an established and an emerging language in a population of adult second language learners. In one guise or another, this concept has benefited from a long research tradition in the fields of second language acquisition and bilingualism as well other areas of linguistics. During that history, the terminology has evolved almost as much as research findings themselves.

Odlin (1989) traces early investigations of crosslinguistic influence to nineteenth century historical linguistics, where the major focus of the time was on language change arising from contexts of language contact, e.g. the existence of ‘language-mixing,’ ‘code-switching,’ and the emergence of ‘pidgins’ and ‘creoles’ as a result of communication between two or more speech communities. In later work specifically on bilingualism, Weinreich (1953) adopted the term ‘interference’ to refer to crosslinguistic influence, thereby revealing the contempt with which the phenomenon was considered.<sup>1</sup> However, as a consequence of such work, crosslinguistic

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<sup>1</sup> The perceived inevitability of ‘interference’ suffered by one language system at the hands of another undoubtedly contributed to generally held beliefs concerning the negative effects of bilingualism as

influence became a topic studied at the level of the individual as well as the speech community. It was not long afterwards that crosslinguistic influence became prevalent in studies on second language acquisition, under the popularized and slightly less prejudiced heading of ‘transfer’. Since then, any survey of SLA, comprehensive or otherwise, has included a segment discussing the issue, and there has been a plethora of individual studies on particular aspects of the phenomenon.

Crosslinguistic influence is therefore firmly entrenched in studies of second language acquisition. However, use of the term is often synonymous with the unidirectional transfer of features from a first language to a second language. Indeed, 13 of the 14 contributions to the landmark volume edited by Kellerman and Sharwood Smith (1986) focused on that issue. In a way, this is perfectly reasonable. Research on second language acquisition does and should observe the functioning of the second language itself, addressing topics such as competence versus performance, internal versus external factors affecting acquisition, individual differences versus universalities, etc. However, a crucial constituent in the definition of crosslinguistic influence is the word “interplay”, which assumes that the relationship between a first and second language is *bi-directional*, and as a result that the systems can *interact*. Moreover, since Grosjean (1982) first asserted that the L1 of a bilingual does not equal the L1 of a monolingual, recognition of the importance of this as an issue even for the field of SLA has been growing slowly but steadily. Although similarly noted by

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discussed by Weinreich, including “split national loyalties and problems of “marginalization”... emotional difficulties, moral depravity (through receiving inadequate religious education in [the] mother tongue), stuttering, left-handedness, excessive materialism, laziness, and detrimental consequences for intelligence”!s (cited in Edwards, 2004:15)

Kellerman and Sharwood Smith back in 1986, to date there has still been relatively little investigation of ‘backwards transfer’, or ‘borrowing transfer’ as it is sometimes called (Odlin, 1989), in other words the way in which one’s emerging second language can interact with and influence one’s established first language.

This chapter situates the current study within other research done from the general perspective of crosslinguistic influence, dealing first with the field of second language acquisition.<sup>2</sup> Both sides are covered: influence of the L1 on the L2, the traditional line of enquiry, and influence of the L2 on the L1, a parallel but much less studied area. Furthermore, recent emphasis on the necessity of bringing novel methodologies to bear on long-standing questions in SLA makes it an ideal time to look across modalities, where new data can contribute insightful observations over and above those gained from conventional linguistic analyses alone. Hence, in addition to customary linguistic data, relevant studies extending to the gestural domain are also included. Finally, research on bilingualism as it pertains to the issue of crosslinguistic influence is addressed.

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<sup>2</sup> Of course, crosslinguistic influence or transfer is also a feature of the acquisition of third and fourth languages. Odlin’s definition of transfer highlights this point, “Transfer is the influence resulting from similarities and differences between the target language and any other language that has previously (and perhaps imperfectly) been acquired” (1989:37). However, particular issues related to these contexts are beyond the scope of this thesis. For an excellent overview of crosslinguistic influence in third language acquisition, see Cenoz, Hufeisen and Jessner (2001).



## **2.2 Crosslinguistic influence in second language acquisition**

### **2.2.1 Influence of a second language on a first language**

We begin with the main focus of this thesis, influence of a second language on the first. Since the field of second language acquisition primarily seeks to explain L2 performance, the issue of whether and how an emerging L2 can influence an established L1 has rarely been considered. With the exception of some early, rather isolated studies, it is only very recently that a handful of serious research efforts in this area have been made (e.g. Cook, 2003).

Among earlier studies of the effects of learning a second language on performance in the first language was Yelland, Pollard, and Mercuri (1993), showing that one hour of language instruction per week positively affected reading outcomes in the L1 among primary school children. In a related examination of written discourse, Kecskes and Papp (2000) conducted a longitudinal study of high-school students. They found improvements in structural well-formedness, particularly complexity of syntax, in L1 writing as a result of immersion or intensive (as opposed to non-intensive) foreign language instruction. And in a similar study of fifth and sixth graders, Cunningham and Graham (2000) found beneficial effects for L1 vocabulary development after immersion in an L2 due to recognition of cognates.

Other more recent work has found evidence of influence that is neither positive nor negative. For example, in research on syntactic processing in mono- and multilingual individuals within the framework of the Competition Model, Cook, Iarossi, Stellakis, and Tokumaru (2003) found no differences in use of word order cues,

but mixed patterns in use of animacy, subjective case marking, and number marking cues. Similarly, in the realm of pragmatics, Cenoz (2003) found a combined intercultural style with properties of the L1 and the L2 employed when making requests in the L1. Furthermore, Dewaele (1999) showed that two years of residence in the UK resulted in modified interrogative structures in the L1 of native speakers of French.

In more 'error-based' analyses, Jarvis (2003) and Pavlenko (2003; Pavlenko & Jarvis, 2002) discovered inaccuracies in the L1 attributable to the L2 among high level learners/bilinguals in the areas of the lexicon and semantics (instances of borrowing, loan translation, semantic extension and narrowing, and retrieval difficulties); morphosyntax (errors in tense and aspect, subcategorization, case-marking, and prepositional choice); and linguistic framing (mixed patterns of adjectives and verbs for expressing emotions due to differences between the L1 and the L2). Similarly, Laufer (2003) discovered that incorrect lexical collocations in L1 were not recognized by bilinguals, and that usage of infrequent words in L1, and to some extent lexical diversity, declined with increased exposure to the L2. Likewise, Balcom (2003), investigating representations of verbs, found that high level learners/bilinguals judged grammatical L1 sentences that did not conform to L2 rules as ungrammatical. While the above findings might have worried the participants concerned, the authors were quick to point out that results did not necessarily indicate language attrition, but "temporary inhibition or deactivation" (Pavlenko, 2003:57) or expanded opportunities for self expression (Jarvis, 2003:101). However, even Jarvis conceded that such expansion could signal the starting point of subsequent attrition.

In sum, although the body of evidence suggesting influence of an L2 on an L1 has been slowly but steadily growing in domains such as the lexicon, syntax, pragmatics and discourse, there are several gaps and methodological difficulties associated with current research. First and foremost among the gaps is the issue of proficiency. As we will see in the following section, proficiency plays a significant role in L1 transfer; therefore, we might expect the same to be true of L2 transfer. However, almost all of the studies cited above deal only with highly proficient learners (although formal proficiency is often not measured). In fact, some authors even call these individuals 'bilinguals' (e.g. Balcom, 2003). Of course, in any pioneering research, it is prudent to begin with data in which a particular phenomenon is most likely to be observed. Hence, in order to look for influence of an L2 on an L1, starting with those who have had the most exposure to the L2 is probably a good choice. And indeed, a recent study by Athanasopoulos (2006) did not show significant effects with a high intermediate group but only with very advanced Japanese learners of English in a cognitive categorization task based on grammatical representation of number. On the other hand, Chen (2006), found influences of the L2 (English) on the L1 (Chinese) with less advanced learners and not with more advanced learners in a sentence combining task involving cause-effect information sequencing. However, all learners, even the lower proficiency group were advanced enough (with TOEFL scores above 500) to be enrolled in graduate programs at American universities. Overall, given the traditional division of labor between SLA and bilingualism on the basis of proficiency, it is questionable whether the majority of studies above actually belong in this review

section at all or should rather appear in the later section reviewing research on bilinguals, where the issue of interaction between multilingual systems is not a novel idea at all.<sup>3</sup>

Another potential difficulty with the studies above is the type of analysis undertaken. Cook (2003) outlines three possible outcomes for the L1 arising from influence of an L2: 'enhanced', 'harmed', or just 'different'. However, much of the work included in his volume relies on error analyses and as such fits into the 'harmed' L1 category. Once again, use of error analysis is perhaps one of the safer methodologies in terms of yielding findings, but can we really be sure of the source of these errors, i.e. the L2, and their generalizability, particularly in cases of small sample sizes? Moreover, there is a perfectly legitimate neighboring field in which some of the findings above would comfortably fit, the field of language attrition. This would be particularly appropriate for the studies whose participants were living in the L2 environment at the time of observation, a classic context for first language attrition. Indeed, the only one of the fourteen original contributions to Kellerman and Sharwood Smith (1986) that addressed the issue of L2 influence on an L1 did so explicitly from the perspective of language loss, comparing L1 attrition of migrant laborers to L2 interlanguage (Py, 1986). I do not claim, of course, that the fields of SLA and attrition are completely separate, for in many ways they overlap. Indeed some argue that attrition is an integral part of any language development, including second language

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<sup>3</sup> Some may argue that the division of labor between SLA and bilingualism is only or at least primarily based on age of exposure; however, a broader definition of bilingualism is taken here, as discussed in section 2.3.

development (cf. Myers-Scotton, 2005). But at the very least we must consider a range of analyses in order to seriously tackle our research questions.

A third methodological criticism of recent research concerns the constraints on what constitutes evidence of crosslinguistic influence, constraints which make for a rather narrow-minded approach. Of course, analyses must be constrained in some way, but to exclude “errors whose origin could not be traced to. [the L1]” (Pavlenko, 2003:40) prevents consideration of phenomena which may emerge as a result of the presence of *any* L2, not just those in the particular language context under investigation. The potential existence of more general phenomena could motivate further exploration and inform our understanding of universalities in interactions in multilingual systems.

A fourth gap in current knowledge relates to the initial state of the L1. The few studies that do not focus on bilinguals and do not employ an error-based analysis (e.g. Cunningham & Graham, 2000; Kecskes & Papp, 2003; Yelland, 1993) are primarily concerned with development of the L1. The populations examined are school-age children and the focus is on how learning a second language can enhance development in a first language along Vygotskian lines: “a foreign language facilitates mastering the higher forms of the native tongue. The child learns to see his language as one particular system among many, to view its phenomena under more general categories and this leads to awareness of his linguistic operations.” (Vygotsky, 1962:110). While this is surely an admirable endeavor, it does not address the issue of

whether acquisition of an L2 can affect a mature L1 in ways that do not necessarily signal attrition.

The final and possibly most serious drawback of previous research is the fact that few studies to date have focused on a systematic comparison of L1 and L2 production *within* individuals in order to fully address the issue of “interplay” between first and second languages. It is probably fair to say that the above research, though novel, is as skewed in its focus as the more traditional studies outlined below, just in the opposite direction. Moreover, without additional comparisons from other language pairings, we cannot hope to disentangle crosslinguistic influences arising from specific L2s from universal influences arising from the presence of second languages in general.

### **2.2.2 Influence of a first language on a second language**

The role of the first language has long been considered a fundamental factor in development of an L2. For language learners themselves, perceived differences between first and second languages almost wholly determine expectations for outcome: success or failure. For the modern researcher, an interest in the role of the first language is motivated by a desire to explain second language / interlanguage performance.<sup>4</sup> Thus, certain features of interlanguage can be traced to features of a source language arising from a process that is known as ‘transfer’. These features are then characterized as being more or less ‘vulnerable’ to transfer particularly in certain contexts or stages of

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<sup>4</sup> Use of ‘modern’ here contrasts more recent investigations of crosslinguistic influence from a cognitive perspective with earlier focus on behaviorism, where learning an L2 simply required the unlearning of habitual patterns in the L1.

development, often with implications for innateness, i.e. specific properties that transfer are probably not those properties that are considered innate.

Given its fundamental position in theories of SLA, any summary of transfer will barely scratch the surface of the mammoth research program that has occupied much of the field in the last three decades. Comprehensive overviews can be found in entire books devoted to the topic (e.g. Gass & Selinker, 1992; Kellerman & Sharwood Smith, 1986; Odlin, 1989), as well as numerous meta-analyses found in handbook chapters (Ellis, 1994; Gass, 1996; Odlin, 2003 inter al.).

In general, L2 patterns explained by influence of the L1 have been found in almost any linguistic sphere one might care to look at. Research can roughly be divided into directly and indirectly observable influences. Direct influences can occur at the broad levels of structure and meaning. More indirect influences are manifest in areas such as concepts and discourse. Perhaps one of the most obvious direct forms of transfer can occur in the sound system. Thus, learners whose first languages differ markedly from the second at segmental and/or suprasegmental levels are less likely to be target-like in both their L2 production (McAllister, Flege, & Piske, 2002; Purcell, 1980) and comprehension (Flege & MacKay, 2004; Scholes, 1968); although development is moderated by universal factors, which in some cases make L2 production different from both source and target production (Eckman, 1981; Major, 1986).

Another major and directly observable area of transfer is that of lexis. Phenomena include negative effects of incomplete translation equivalents (Jiang, 2002;

Ringbom, 1978) and false friends (Holmes, 1977), and mixed effects of cognates (Adjémian, 1983; Sjöholm, 1976). In a related domain, foreign language use of non-target bound morphemes has been attributed to influence of the L1 (De Angelis & Selinker, 2001). However, there are constraints on transfer in the domain of lexis on the basis of perceived similarity and frequency, for example, limited transfer of multiple meanings of polysemous words, particularly in idiomatic usages (Kellerman, 1986).

Further evidence suggests direct transfer in syntax, but this is somewhat more controversial. Odlin (1989; 2005) notes findings suggesting transfer in the areas of word order in production (Trevisi, 1986) and comprehension (Gilsan, 1985), although whether results actually point to syntactic transfer or universal developmental trajectories is a topic of discussion. Other areas of L2 syntax found to be susceptible to influence by L1 patterns are relative clauses (Hyltenstam, 1984; Matthews & Yip, 2003) and possibly negation (Stauble, 1984), although again patterns could reflect general learning principles. Finally, in a recent wide-ranging study of five major syntactic areas, including adverb placement and use of copula, Chan (2004) found significant evidence of L1 transfer, albeit in written L2 discourse.

Indirect influences arise when effects in one domain have repercussions in another. Conceptual transfer, which Odlin (2005) considers to be a subset of meaning transfer and defines as transfer of semantic representations, can be regarded as both a catalyst for and recipient of change. Jarvis (1998), for example, attributed distinct lexical choices describing motion to differences in conceptualization between the L1 and L2. Similarly, Carroll, Murcia-Serra, Watorek and Berdiscioli (2000) conclude



from investigations of the spatial domain that, despite surface accuracy, distributional differences in the production of spatial terms can signal transfer of spatial representations.

Additional indirect influences can be observed from and in domains such as pragmatics, discourse, and processing strategies. Olshtain (1983), for example, found evidence of influence of the L1 in research on requests, and similar discoveries have been made in the area of apologies (Borkin & Reinhart, 1978) and refusals (Takahashi & Beebe, 1987). With reference to discourse, Schachter and Rutherford (1979) argued that particular surface errors seemingly arising from transfer of syntax, e.g. errors with active and passive forms, could actually be explained by transfer of discourse features, e.g. topic-comment structures. Furthermore, language processing within the framework of the Competition Model (Bates & MacWhinney, 1982; 1987; 1989) is characterized by use of semantic and syntactic cues from the L1 to resolve processing difficulties in L2 comprehension, even predicting that 'all aspects that can transfer, will transfer' (MacWhinney, 1997:119).

Finally, a much less studied area is that of gesture. Here, gestures constitute indirect evidence of transfer in other linguistic domains. In an investigation of reference tracking in discourse, Yoshioka (2005) speculated that without explicit lexical means to encode the informational status of referents in the L2 in a manner similar to the L1, Dutch learners of Japanese recruited gesture to fulfill this role. In this way, transfer of informational structure from the L1 was manifest in gesture in the L2. Similarly, Gullberg (in prep) showed how target-like sounding Dutch learners of French

incorporated fine-grained semantic details of placement verbs from their L1 into gestural hand-shapes in their L2. In other words, conceptual transfer of semantic features of placement verbs in the L1 was revealed in L2 gesture.

In addition to a focus on different components of the language system described in the vast number of studies on crosslinguistic influence, other factors have been considered. Proficiency in the L2 is one such factor, i.e. the idea that levels of L1 influence co-vary, negatively and positively, with stages of L2 development (Klein & Perdue, 1986; Major, 1986; Taylor, 1975). For example, phonological transfer is strongly characteristic of early stages of second language acquisition (Major, 1986), whereas later stages may exhibit increased transfer in the area of complex syntax (Hyltenstam, 1984; Kellerman, 1983). Furthermore, social context has also been found to affect crosslinguistic influence (Beebe, 1977; Tarone, 1982). For example, transfer is less likely in the language classroom, where it is viewed as negative, in contrast to naturalistic settings, where it might be considered an acceptable part of interaction (Odlin, 1989; 1990). Similarly, markedness of linguistic forms plays a role. Learners are claimed not to transfer L1 forms if those forms are marked or unusual, e.g. variations in German word order depending on clause type will not be transferred to L2 English (Zobl, 1984). Finally, even the impact of learner perceptions on such things as prototypes (Kellerman, 1986) and language distance and psychotypology (Kellerman, 1979; Ringbom, 1987; Sjöholm, 1979) have been studied, with the finding that the less similar learners judge the L1 and the L2, the less likely they will be to transfer L1 forms.

In sum, this overview has attempted to give a flavor of research on crosslinguistic influence in the field of SLA. We have seen how the L1 can influence the L2 directly and indirectly in many linguistic domains, and how such influence can be mediated by other factors. As mentioned above, research in SLA has primarily focused on this direction of influence, as opposed to the reverse direction, in order to explain production in a second language. While transfer from the L1 is sometimes characterized as positive in cases where source and target languages share similar features, it is more often considered negative and reflective of incomplete L2 acquisition due to the preponderance of differences across languages. Research on influence of the L2 on the L1, on the other hand, is motivated by different factors such as the desire to understand how languages are organized in the multilingual mind. However, since the little work done on this area has not taken L2 production simultaneously into account, it offers only a partial answer to this issue. Moreover, since research thus far has primarily yielded evidence of errors in the adult L1, the apparent conclusion seems to be that, at least in some cases, acquisition of a second language causes loss of the first. Overall, then, crosslinguistic influence in either direction is largely viewed as negative by the field of SLA. The field of bilingualism, in contrast, takes a different position.

### **2.3 Crosslinguistic influence in bilingualism**

In reviewing any research on bilingualism, one is initially faced with problems of definition in part due to the dispersal of research in fields as wide ranging as

historical and contact linguistics, psychology, sociology, education, and international studies. Classifications range from Weinreich's (1953) claim that a bilingual is someone who alternates use of two languages to Haugen's (1953) assertion that a bilingual is simply someone able to produce complete and meaningful utterances in a second language, a definition which, according to Edwards (2004), does not distinguish between use of a formulaic phrase, e.g. *C'est la vie*, and complete command of a second language. For the purposes of this review section, a bilingual is defined as a highly proficient speaker of two or more languages and, along the lines of Weinreich (1953), someone who alternates between languages on a regular basis. Furthermore, the main focus will be on studies of adults who are consecutive bilinguals as opposed to child simultaneous bilinguals. Yet, even this definition is somewhat problematic as some studies on so-called "bilinguals" do not formally test proficiency or even gather detailed information on language history and current usage, although the difficulties associated with assessment of bilingual populations are well documented (see Hamers & Blanc, 2000 for a comprehensive overview of assessment procedures). In employing such parameters, we automatically bring the bilingualism literature reviewed from this perspective closer to that found in studies of second language acquisition. Indeed, some even refer to these fields interchangeably. However, the distinction between SLA and bilingualism is maintained because of their differing perspectives on interaction between languages.

In comparing historical treatment of crosslinguistic influence in the fields of second language acquisition and bilingualism, we see that the former has primarily

concentrated on unilateral language influence from the developed to the developing language. The latter, on the other hand, while often referring to dominant and non-dominant languages, tends to assume the existence of at least partial interaction between two languages in the mind and focuses on identifying the nature of that interaction. However, despite a common starting point, controversies abound in literature on bilingualism.

With reference to the issue of one or two systems, several polarized positions exist. Overall, most of the following studies concentrate on the level of the single word, and as a result the discussion has mainly centered around the mental lexicon. At the start of this debate, there were conflicting findings on whether a bilingual speaker possessed one or two lexicons (Schwanenflugel & Rey (1986) versus Taylor (1971)). Later work showed that common versus separate storage may be affected by the makeup of specific lexical items, for example concrete versus abstract nouns (cf. de Groot, 1995). There has also been intense discussion of whether lexical processing is language-selective or not (Gerard & Scarborough (1989) versus Dijkstra & van Heuven (2002)), which can depend on the frequency of lexical items and the degree of orthographic and/or phonological similarity between words in different languages, and whether conceptual representations are shared or distinct (Pavlenko (1999) versus Kroll & de Groot (1997)), to name but a few of the foci of debate. In addition, while the phenomenon of codeswitching is perhaps one of the most concrete manifestations of online interaction between multiple languages, questions surround its constraints (Myers-Scotton & Lake (2003) versus Muysken (2000)). All of these debates are, of

course, subject to issues of structural similarities between languages, age and length of exposure to the different languages in the multilingual speaker's repertoire, and relative proficiency in each of the languages.

A less polarized discussion revolves around the issue of "convergence" in parts of the bilingual language system. A recent discussion defined synchronic processes of convergence in bilingualism as

*"enhancement of inherent structural similarities found between two linguistic systems ... [which] differs from interference and transfer, each of which implies the imposition of a structural property from a foreign source language. Here, the direction of influence between the languages is irrelevant; it may be mutual or unidirectional. Inherent in this definition is the fundamental notion that what distinguishes convergence from other cross-linguistic effects is that convergence is not necessarily externally induced"* (Bullock & Toribio, 2004).

Linguistic domains treated in this discussion included phonology (cf. Bullock & Toribio, 2004; Colantoni & Gurlekian, 2004) and syntax interfaces, e.g. syntax with semantics / pragmatics / discourse, as opposed to core domains such as syntax proper (cf. Montrul, 2004; Sanchez, 2004).

Further studies of convergence in conceptual representations between multiple language systems have been investigated with regard to color perception (Athanasopoulos, Sasaki, & Cook, 2004; Ervin, 1961), perception of time (Boroditsky, 2001), and classification of objects on the basis of shape versus material (Cook,

Bassetti, Kasai, Sasaki, & Takahashi, in press) and on the basis of grammaticalized number marking (Athanasopoulos, 2006).

In addition to research on conceptual representations, there have been a very limited number of studies on gestures in bilingualism. Although such research has typically focused on bilingual development in children (e.g. Nicoladis & Brisard, 2002; Nicoladis, Mayberry, & Genesee, 1999; Von Raffler-Engel, 1976), a study by Lacroix and Rioux (1978, cited in Hamers & Blanc, 2000) found that adult French-English bilinguals exhibited a unique gestural repertoire, which differed from monolingual speakers of English and French. In addition, Pika and Nicoladis (2006) found evidence of bidirectional transfer in gesture rate between English-Spanish and French-English bilinguals, i.e. a higher rate of gesturing among bilinguals as compared to English monolinguals. However, the authors acknowledge that gesture rate could simply be an effect of bilingualism, and more research is needed to tease apart language-specific from universal effects.

Discussions of convergence may be less polarized than the ‘one system–two system’ debate, but research in this area is not without its own problems. These include limitations on the domains studied thus far, but also the construct itself. In particular, work using an error analysis approach often equates convergence with transfer or language loss (e.g. Montrul, 2004). Despite these limitations of studies on convergence and those on bilingualism in general, the prevailing view from research on bilinguals is one of interaction between language systems to some degree at least.

## 2.4 Summary

From the literature reviewed above, it is clear that we have far to go in achieving an accurate understanding of the relationship between language systems in the mind of a bilingual/second language speaker. In the case of bilingual speakers, little research has extended beyond the single word level into natural language usage. In the case of second language learners, through explaining features of L2 usage, we have gained some understanding of the nature of the influence of the L1, as evidenced by the wealth of research cited above. However, since it is not used as an explanatory factor for L2 performance, the issue of whether and how an L2 can influence an L1 in the process of second language acquisition has received much less attention. Therefore, we cannot yet say whether language influence within a given linguistic domain is truly *cross-linguistic*, and if it is, how the relationship between languages can be characterized as a consequence. Furthermore, traditional study of the effects of an L1 on an L2 assumes that such influence is motivated by incomplete acquisition of the L2. The recent research on L2 influence on an L1, with a similar focus on language 'errors', frequently concludes that L1 attrition is the product of influence. Yet crosslinguistic influence could be motivated by factors other than imperfections in language systems, for example, conscious or unconscious exploitation of expanded means of self expression. Having identified the need for further research in this area, we turn next to a description of the methodology employed in this thesis.



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## **Chapter 3: General Methodology**

### **3.1 Introduction**

This dissertation consists of three independent but related studies. The studies vary in the number of participants included in the analyses and the specific coding of speech and gesture, which was determined by the particulars of the research questions involved. Methodological details unique to each study are outlined in the relevant chapters. What follows, then, is an explanation of the methodology common to all studies, beginning with a description of the participants, followed by descriptions of the stimuli, procedure, coding of speech and gesture, and general information regarding data analyses.

### **3.2 Participants**

#### **3.2.1 General information**

A total of 57 adults participated in this study. These were recruited through local contacts and from advertisements in community centers. Basic information about participants is summarized in Table 3.1. More details follow in subsequent sections, and a full breakdown of biographical information, language usage and language proficiency appears in Appendix I.

Table 3.1: *Summary of basic participant information*

Group	Age Range	Gender	Total # Participants
Monolingual Japanese	34 – 44 yrs	15: female 1: male	16
Monolingual English	18 – 48 yrs	4: female, 9: male	13
Native Japanese speakers intermediate L2 English (Japan)	19 – 47 yrs	13: female 2: male	15
Native Japanese speakers intermediate L2 English (USA)	21 – 45 yrs	7: female 6: male	13

All participants in this dataset were selected for inclusion in the study based initially on *usage* of English, i.e. current and previous usage. The learners of English additionally completed proficiency measures in order to ensure comparable proficiency in their L2. Details of language usage and proficiency measures follow.

### 3.2.2 General language usage and L2 proficiency measures

Biographical information and information on general language usage was gathered using a detailed questionnaire developed by the Multilingualism Project at the Max Planck Institute.<sup>1</sup> This measure ensured that the monolingual speakers of each language were “monolingual” with respect to usage of English, i.e. Japanese monolinguals had never used English in their daily lives (outside secondary education classes) at all, whereas English monolinguals used English all the time. However, these monolingual speakers were not true monolinguals in the sense that they had never been exposed to another language. Indeed such a profile would be difficult if not impossible to find in today’s multilingual and multicultural world. All monolingual participants

<sup>1</sup> See <<http://www.mpi.nl/research/projects/Multilingualism>>

had received foreign language classes at school and in some cases at university; however, none considered themselves as having more than basic proficiency in any foreign language. They can therefore be considered “minimally bilingual” (Cook, 2003:14), i.e. they have had minimal exposure to a second language, they are not engaged in active study of a second language, nor do they use a second language in their everyday lives.

The native Japanese-speaking participants with knowledge of English were also selected for this study initially on the basis of their usage of English. In addition, L2 proficiency in English was formally tested to ensure homogeneity in the sample. Proficiency in English was measured in three ways: one subjective measure and two objective measures. In the subjective measure, participants rated their own English language proficiency, which required individual scores in speaking, listening, writing, reading, grammar, and pronunciation. Proficiency in English was then independently measured using two external diagnostics.

The first external proficiency diagnostic was a written cloze test consisting of 50 items, the first grammar section of the Oxford Placement Test (Allan, 1992), which is considered particularly appropriate for students at an intermediate level. However, since the data elicitation procedure employed in this study elicited oral data, the second measure was an evaluation of oral proficiency using the University of Cambridge Local Examinations Syndicate (UCLES) oral testing criteria for the First Certificate exam. The First Certificate in English (FCE) is mid-level in the Cambridge suite of exams in English proficiency, with two lower-level exams (Key English Test, KET, and



Preliminary English Test, PET) and two higher-level exams (Certificate in Advanced English, CAE, and Certificate of Proficiency in English, CPE). According to the examining board, individuals at the FCE level are considered to have generally effective command of the spoken language: they are able to communicate effectively in familiar situations, display generally organized extended discourse, but exhibit some hesitations, inaccurate / inappropriate usage, and occasional intrusiveness of L1 features in pronunciation. In contrast, individuals at the lowest level of UCLES exam, KET, are considered to demonstrate only basic command of the spoken language: their speech tends to be formulaic, in very short utterances within extremely limited discourse, and pronunciation is so influenced by L1 features that it is incomprehensible at times. At the other end of the spectrum, individuals at the CPE level are considered to have fully-operational command of the spoken language: they are native-like in terms of language usage, discourse coherence and pronunciation.<sup>2</sup>

It should be noted that this study did not incorporate all of the same tasks involved in the FCE, which include an interview, individual description exercise, collaborative task, and free discussion. However, the oral testing criteria were applied to the descriptive narrative data elicited from participants as part of the study (i.e. narratives of the Canary Row stimulus). These narratives were subsequently scored in the areas of grammar and vocabulary, discourse management, pronunciation, and global achievement with a consensus judgment by two Cambridge-certified examiners. Regarding the relationship between the two proficiency measures, students at the FCE

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<sup>2</sup> More information can be found at <<http://www.cambridgeesol.org>>

level are generally expected to score between 67% and 80% on the Oxford Placement Test.

Full biographical details of participants in each group as well as individual proficiency scores in English can be found in Appendix I. A summary of the most important biographical and proficiency information is given below.

### **3.2.3 Monolingual speakers of Japanese**

The 16 monolingual Japanese speakers lived in the Kansai area of Japan. Languages reportedly learned comprised Chinese, English, Korean, and Spanish. Global self-ratings of proficiency in these languages ranged from 1 to 3 out of 5 with an average rating of 1.53 across participants. Given that English is a mandatory component of the Junior High and High School curricula, all participants had received several years of English instruction generally beginning around the age of 13. However, self-ratings of proficiency specifically in English ranged from 1 to 2.5 with an average of just 1.35. Most participants had never spent more than a week or so out of the country, although one female had spent three years in Spain as a university student (16 years prior to participation in this study). No monolingual Japanese speakers reported using a foreign language, in particular English, in their day-to-day lives. This information is summarized below in Table 3.2.

### 3.2.4 Monolingual speakers of English

The 13 monolingual English speakers lived in and around Boston, USA. Languages reportedly learned comprised French, German, Italian, and Spanish. Global self-ratings of proficiency in these languages, a composite of individual scores in speaking, listening, writing, reading, grammar and pronunciation, ranged from 1 to 3 out of 5 with an average rating of 1.79 across participants. None of these English-speaking monolinguals had ever learned any Japanese, they had not spent longer than one month in another country, and most did not report using a foreign language in their day-to-day lives (one participant reported communicating with friends in French for approximately one hour per week, and another reported reading in French for one hour per week). This information is summarized below in Table 3.2.

### 3.2.5 Native Japanese speakers with intermediate knowledge of English

The 28 native Japanese speakers with intermediate knowledge of English were divided into two sub-groups: 15 participants living in Japan, with limited experience in an English-speaking country and with no recent residence overseas, and 13 participants living in the USA, with extensive immersion in the culture. Two independent-samples  $t$  tests revealed that the two groups did not significantly differ in proficiency as measured by the Oxford Placement Test ( $t(25) = .795, p = .434$ ), and only marginally differed in proficiency as measured by the Cambridge FCE criteria ( $t(26) = 1.982, p = .058$ ), with the learners resident in *Japan* scoring slightly higher than those resident in the *USA*.

Since the groups were matched as closely as possible on formal proficiency in English, the contrast in residence was designed in the first instance to test the impact of cultural exposure, particularly on gesture patterns. Gesture patterns can be culturally determined; alternatively, they can be motivated by the linguistics of the accompanying speech. In the former scenario, different gesture patterns would be observed between the two non-monolingual groups. In the latter case, comparable gesture patterns would be observed between the two groups. Furthermore, contrasting residence was designed to control for possible effects of L1 attrition. Effects seen in the L1 only among those living in the USA might be explained by loss of the first language due to residence in a second language community. However, similar L1 patterns between both groups would render an explanation based on L1 attrition less likely. Each group of native Japanese speakers with intermediate knowledge of English is described separately below.

### **3.2.5.1 Native Japanese speakers with knowledge of English resident in Japan**

The 15 native Japanese speakers with intermediate knowledge of English resident in Japan also lived in the Kansai area. Languages reportedly learned comprised Chinese, English, French, German, Indonesian, Italian, Korean and Spanish. Global self-ratings of proficiency in these languages ranged from .67 to 4.17 out of 5 with an average rating of 2.10 across participants. Self-ratings of proficiency specifically in English ranged from 2 to 4.17 with an average of 2.97. Of the fifteen individuals in this group, eight had spent some time overseas: four individuals had spent less than three months abroad, two had spent between six months and 1 year abroad, and two had

spent more than a year abroad. However, residence abroad for all but one of the participants had been completed between 8 and 22 years prior to participation in this study. Age of first exposure to English (in terms of formal learning) in this group ranged from 9 to 13 years of age. All participants reported using English on a daily basis from between .5 and 8.5 hours (average approximately 3 hours per day) for purposes including communicating with colleagues or friends, reading, watching TV, or using the Internet.

Self-ratings of proficiency in English among individuals in this group, though higher than self-ratings of English proficiency reported by the monolingual speakers of Japanese (2.97 versus 1.53), do not look especially high. However, the independent measures of proficiency for this group revealed a mean score on the Oxford Placement Test of 78% (range 60% to 88%) and a mean global score on the Cambridge FCE of 4.27 out of 5 (range 2 to 5), placing these participants in the FCE or intermediate range. This information is summarized below in Table 3.2.

### **3.2.5.2 Native Japanese speakers with knowledge of English resident in the USA**

The 13 native Japanese speakers with intermediate knowledge of English were living at the time of participation in the study in and around Boston, USA. Languages reportedly learned comprised Chinese, English, French, German, and Italian. Global self-ratings of proficiency in these languages ranged from 1 to 4.33 out of 5 with an average rating of 2.48 across participants. Self-ratings of proficiency specifically in English ranged from 1.83 to 4.33 with an average of 3.27. All of the thirteen

individuals in this group had a length of residence in Boston of between one and two years. In addition, one participant had previously spent ten months in the USA, while a second participant had spent three years in Australia. Age of first exposure to English (in terms of formal learning) in this group ranged from 12 years of age to 14 years of age. All participants reported using English on a daily basis from between 1 and 12 hours (average approximately 6 hours per day)<sup>3</sup>, for purposes including communicating with colleagues or friends, reading, watching TV, or using the Internet.

Self-ratings of proficiency in English among individuals in this group were higher than self-ratings of English proficiency reported by the non-monolingual group living in Japan (3.27 versus 2.97). However, the independent measures of proficiency for this group revealed a mean score on the Oxford Placement Test of 75% (range 58% to 85%) and a mean global score on the Cambridge FCE of 3.69 out of 5 (range 2.33 to 5). Therefore, in contrast to the self-rating score, both independent measures of proficiency placed the non-monolingual participants in the USA at a slightly lower level of proficiency than those in Japan (marginally significantly lower in the case of the FCE score), but they were still well within the FCE or intermediate range. This information is summarized below in Table 3.2.

### **3.2.6 Summary of language background for all participant groups**

Table 3.2 below summarizes the main elements of language background for all participant groups.

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<sup>3</sup> One participant reported daily usage of English in excess of the number of hours that exist in a day. This self-report did not enter into the calculation of average usage of English.

Table 3.2: *Summary of biographical information*

Group	Languages studied	Mean self-rating <sup>a</sup> : all langs	Mean AoE <sup>b</sup> : English	Mean usage <sup>c</sup> : English	Mean self-rating <sup>d</sup> : English	Mean Oxford Score	Mean FCE Score <sup>e</sup>
Mono Japanese	Chinese English Korean Spanish	1.53 (range 1-3)	12.3 (range 7-14)	None	1.35 (range 1-2.5)	NA	NA
Mono English	French German Italian Spanish	1.79 (range 1-3)	Birth	NA	NA	NA	NA
Japanese L2 English (Japan)	Chinese English French German Indonesian Italian Korean Spanish	2.10 (range .67-4.17)	11.9 (range 9-13)	3 hrs (range .5-8.5)	2.97 (range 2-4.17)	78% (range 60-88%)	4.27 (range 2-5)
Japanese L2 English (USA)	Chinese English French German Italian	2.48 (range 1-4.33)	12.8 (range 12-14)	6 hrs (range 1-12)	3.27 (range 1.8-4.3)	75% (range 58-85%)	3.69 (range 2.3-5)

<sup>a</sup> Composite score in all skills; <sup>b</sup> Age of exposure; <sup>c</sup> Hours per day; <sup>d</sup> Composite score in all skills; <sup>e</sup> Total out of 5

### 3.3 Stimuli

Data were obtained through a narrative retelling task. Narratives were elicited based on the six-minute, animated, Sylvester and Tweety Bird cartoon, “Canary Row” (Freleng, 1950). This cartoon has been widely used in speech and gesture data collection with successful results. Each scene contains numerous motion events, and narration of the scenes typically elicits abundant gestures (cf. Kita & Özyürek, 2003; McNeill, 1992, 1997; Özyürek, 2002 inter al.).

The basic premise of the cartoon centers around Sylvester's repeated attempts to catch Tweety, attempts which consistently fail. The entire cartoon was broken down and shown in manageable scenes following McNeill (1992) in order to get maximal information from participants and increase the likelihood of mention of motion events. Each scene represented the enactment of one of Sylvester's ingenious, but hopeless, plots to capture Tweety. One such scene, the "Rope" scene, showed Sylvester using a telescope to take measurements of the distance between the building he was in and the opposite building, where Tweety lived. Sylvester made numerous calculations and drew a complex diagram on an architect's drawing board. He then proceeded to swing across the street on a rope, aiming for Tweety's window. Needless to say, having made a mistake in his calculations, he missed the window, crashed into the wall of the building, and slid down to the ground. Throughout Sylvester's endeavor, Tweety watched and made sarcastic comments. A detailed frame-by-frame analysis of each of the three scenes analyzed here can be found in Appendix III.

The order of scenes was systematically varied in the presentation of the stimulus. More specifically, two different orders for the scenes were constructed, although the first and last scenes remained in first and last position for both orders. Each order was shown to half the participants. Despite this variation in presentation order, the scenes formed a coherent whole, and participants clearly treated them as parts of a single narrative. Such stimulus material with the potential to elicit rich narrative enabled participants to fully engage in the rhetorical style they were most



accustomed to and allowed analysis of motion event expressions in the context of extended discourse.

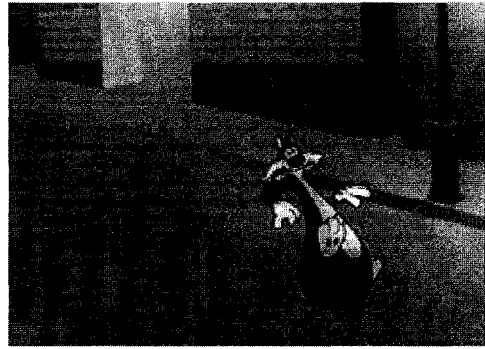
From the stimulus material, four motion events were selected for coding and analysis. These were selected because participants consistently talked and gestured about them as part of their narratives. These are briefly described in Table 3.3 with screen shots of each in Figure 3.1.

Table 3.3: *Motion events selected for coding and analysis*

<b>Scene</b>	<b>Motion Event</b>
Bowling Climb	Sylvester goes inside a drainpipe and climbs up, trying to get to Tweety's room
Bowling Roll	Sylvester rolls down the street with a bowling ball in his stomach, and goes into a bowling alley
Drainpipe Climb	Sylvester climbs up the outside of the drainpipe, trying to get to Tweety's room
Rope Swing	Sylvester swings on a rope across the street, again trying to get to Tweety's room



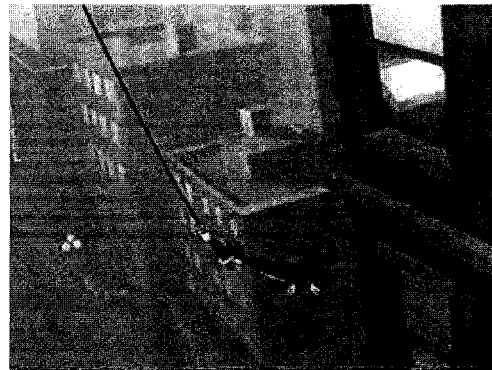
Bowling Climb



Bowling Roll



Drainpipe Climb



Rope Swing

Figure 3.1: *Screen shots of motion events selected for coding and analysis*

### 3.4 Procedure

Prior to participation in the experimental task, participants were pre-screened for language background and use. They were asked to complete the biographical questionnaire detailing language usage and rating proficiency in their foreign languages. In addition, native Japanese speakers with knowledge of English were briefly and informally interviewed in English in order to make an initial assessment of English proficiency. If they were deemed acceptable for inclusion in the study, they subsequently completed the Oxford Placement Test.

Monolingual informants (English and Japanese) participated in the study once, performing narratives in their native language only. Native Japanese speakers with knowledge of English participated in the study twice, performing narratives based on the same set of stimuli both in their first language (Japanese) and in their second language (English). The language order in which the non-monolinguals gave descriptions was counter-balanced across participants, and a minimum of three days fell between their first and second appointments.

All participants were ‘tested’ individually by a confederate, a native speaker of the language of the experiment. The participant and experimenter first engaged in a brief warm-up, consisting of small talk in the target language. The purpose of such small talk was two-fold. First, we wanted the participants to feel relaxed and comfortable, in order to elicit more natural narratives and to increase the likelihood of gesturing. In Japanese culture, as in many cultures, it is generally considered rude to gesture in formal situations; we therefore tried to make the procedure as informal as possible. Secondly, we wanted to avoid putting participants in “bilingual mode” (Grosjean, 1998). Given that our research question is about the existence of interactions between languages in the multilingual mind, we wanted to ensure the most conservative experimental set-up possible and keep participants in a single language mode.

Next, the experimenter explained to participants that they would be watching a series of animated scenes from a cartoon on a computer screen and would be expected to retell what they had seen to the experimenter while being videotaped. They essentially knew that the experimenter was a confederate, but were informed that s/he

had not seen the cartoon and that they should describe the events in as much detail as they could remember. As stated above, the order of scenes was varied with the exception of the first and last scenes. Participants controlled stimulus presentation on the computer themselves by touching the downward arrow key, after which the animations started automatically. At the end of each scene, participants encountered a blank screen on the computer and were instructed to begin describing what they had just seen. The experimenter was trained to appear fully engaged in the participants' narratives, but to avoid asking questions and to intervene as little as possible, apart from making encouraging comments, in order to minimize the effects of interaction. Questions from participants were answered briefly, provided that the question did not involve supplying the target Manner or Path. If the participant requested to view the scene a second time, they were allowed to do so. At the end of each description, the participant could once again push the downward arrow key to start viewing the next scene. The experimenter carefully monitored the number of descriptions given to ensure that none were missed.

A couple of additional procedures were employed for experiments where participants were performing in their L2 (English). Before participants began viewing Canary Row, they were introduced to a word list containing key nouns from each scene. This word list remained within view throughout the experiment, and participants were free to consult it at any time. The word list served two purposes. Firstly, in order to minimize appeals to the experimenter for lexical assistance, nouns previously identified as low-frequency items that participants might have trouble producing in the

L2, e.g. *birdcage, trolley*, were provided. Secondly, it was expected that participants would require a longer time to produce each narrative given that production was in the L2; therefore, the nouns served as a memory aid in case participants forgot the main thread of a scene.

### **3.5 Data Treatment**

Digital video data were transformed into MPEG1 for coding and analysis. All narratives were transcribed by a native speaker of the relevant language. Elan, a digital video tagging software program developed at the Max Planck Institute for Psycholinguistics was used to tag and code the data.<sup>4</sup> Elan enables a frame-by-frame analysis (at 40 ms intervals) of movement as well as sound.

#### **3.5.1 Speech data treatment**

Spontaneous narratives were divided into “clauses”, defined as “any unit that contains a unified predicate ... (expressing) a single situation (activity, event, state),” following procedures laid out in Berman and Slobin (1994:660). Clause boundaries throughout this thesis are indicated by square brackets. This method of segmentation was chosen to make the process of data analysis for the languages involved as crosslinguistically comparable as possible, but also because the clause is one of the units of differentiation in the typology of motion events as outlined in Chapter 1.

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<sup>4</sup> See <<http://www.mpi.nl/tools/elan.html>>.

However, linear segmentation of spontaneous speech, whatever the unit of division, does present certain challenges. Clauses sometimes contain two verbs. In these cases, infinitives or participles functioning as complements of modal or aspectual verbs were not segmented separately, e.g. [*I want to go*], and neither were predicates that were narrator comments, e.g. [*I think he went*]. Relative clauses that stranded subjects from matrix verbs were segmented as separate verb clauses, and the stranded subject was indexed to its predicate, e.g. (*The cat*<sup>1</sup>) [*who was in the opposite building*] [*tried to go to Tweety's room*]. Finally, cases of false starts and clear self-corrections were also not segmented as separate clauses, e.g. [*He went up, no, he went down*].

After segmentation of narratives, clauses describing the four target motion events were identified and isolated. This also created some difficulty as speakers often referred to a given event in different ways at various points in the discourse. Considering that the crux of the stimulus material concerned Sylvester's repeated *attempts* to catch Tweety, speakers produced clauses depicting what Sylvester wanted to do, what he thought about doing, what he planned to do, or what he actually did, or a combination of these processes, e.g. *Sylvester wanted to go to Tweety's room, so he thought about swinging, and he planned to swing with a rope, but when he swung ...* Because speakers were completely free to tell the story in whichever way they pleased, no principled criteria could be established for exclusion of any of these categories. Therefore, all clauses relating to the target motion events, those expressing desire,

thought, planning or realization, were segmented as relevant and coded.<sup>5</sup> Examples of these processes in English and Japanese are outlined below.

### 3.5.1.1 Treatment of spontaneous speech in English

An example of a narrative from a monolingual English-speaking participant describing the entire Bowling scene is given in (1). This narrative has been divided into clauses as indicated by brackets.

- (1) 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*]

The narrative in (1) contains ten clauses in total. Four of these clauses contain mention of the relevant motion events for this scene. Clauses 1 and 3 relate to the

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<sup>5</sup> The only exception to this was in the cases of Bowling Climb. There were essentially two instances of the event Bowling Climb. One involved Sylvester's entering the pipe and starting to climb up. The other involved Sylvester's crashing into the bowling ball, while *he was still climbing up the drainpipe*. Since the second instantiation of Bowling Climb was essentially conflated with another event, all mentions of climbing after Tweety had dropped the ball down the drainpipe were not identified as relevant for coding of the Bowling Climb event.

Bowling Climb event and 8 and 9 relate to the Bowling Roll event. The properties of these clauses were subsequently coded according to criteria established for the particular research question, criteria which are described in later chapters. More examples of clauses relevant to each motion event can be found in (2).

(2) Bowling Climb event

*[and he climbs up the drainpipe]*

*[you see Sylvester slithering up the drainpipe]*

Bowling Roll event

*[and then he goes rolling down the street]*

*[and he starts rolling down the roadway into a bowling alley]*

Drainpipe Climb event

*[and so he climbs up the up the drainpipe on the outside]*

*[and crawls up the drainpipe]*

Rope Swing event

*[he attempts to swing over with the rope]*

*[he's just going to swing across into the window from one building to the next]*

However, in addition to data in English from monolingual English speakers, data was collected from learners of English, which presented particular challenges. L2 data, especially at this level of proficiency, is characterized by numerous false starts, repetitions, and unclear semantics; therefore, it is rather difficult to segment into clauses, identify as relevant for a given motion event, and also to code for semantic



representation. An example clause from a learner of English describing the Bowling Roll event is given in (3)

(3) [*there was sucked into the ah the cat sucked into the bowling center*]

In example (3), the first five words were treated as a false start and were included in the clause proper, which was determined to begin at *the cat* as the subject of the following verb. However, this was not the only possibility. The noun phrase *the cat*, could technically have been the direct object of the first verb, *sucked*, and a new clause, without an overt subject, may have been initiated at the second instance of the verb. This would have resulted in two clauses. This example is complicated by the fact that the verb *suck* is not an appropriate description for the cat entering the bowling alley. In general, in examples such as these, where at least parts of a preceding phrase were repeated, the first phrase was treated as a false start and maintained as part of the main clause.

However repetitions themselves caused difficulty for coding. An example of a clause from another learner of English describing the Bowling Climb event is given in (4).

(4) [*This time he she tried climbing up to the room ah through the drainpipe ah along the wa mmm ah mmm through the drainpipe*]

Example (4) is a crucial example that could impact analyses because the locus of disfluency is exactly in the part of the clause that describes the relevant motion, i.e. *climbing through the drainpipe*. Here, all instances of, for example, Path expression could have been coded: *up*, *to*, *through*, *along*, and *through*. In reality, though, use of

the word *along* appears to have been abandoned and the second use of *through* is simply an echo of the first. In these cases, then, only a non-abandoned expression and only one instance of a repeated expression were coded, in this case use of *up*, *to*, and *through*.

### 3.5.1.2 Treatment of spontaneous speech in Japanese

Clause segmentation of spontaneous speech in Japanese was challenging due a particular type of verbal morphology.<sup>6</sup> Japanese is characterized by much less overt use of tense on verbs, and status of the connector morpheme, *-te*, is rather unclear. An almost infinite number of verbs with the suffixed morpheme *-te* can be concatenated, with tense appearing only on the final verb in a stretch of Japanese discourse. *-te* is by far the most popular connector in Japanese (Hasegawa, 1996), and many meanings have been ascribed to it. It is the semantics of *-te* which pose a problem for clause segmentation of spontaneous speech in Japanese. Martin (1975), for example, claims the existence of nine meanings of *-te* as shown in (5).

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<sup>6</sup> Modified nouns also proved difficult to deal with in Japanese. An example of a modified noun appears below:

*sore-ni kizuita tori-wa bouringu-no tama-wo sono paipu-no*  
 that-to noticed bird-Top bowling-Gen ball-Acc that pipe-Gen  
*ue-kara irete*  
 up-from put

‘the bird, which noticed it, put the bowling ball in the pipe from above’

In this example, *sore-ni kizuita* modifies the noun *tori-wa*. There are several ways one could segment such an utterance; however, a decision was made to treat such constructions like relative clauses in English. Thus, verb clause boundaries were applied as follows

[*sore-ni kizuita*]  
 [*tori-wa bouringu-no tama-wo sono paipu-no ue-kara irete*]

While it may not have been the best decision to separate the noun from its modifying phrase, at least this procedure was applied consistently throughout the Japanese data and did not therefore impact the crucial intra-language comparisons.

- (5)
- a. temporal sequence – “and then”
  - b. consequence – “and so”
  - c. contrast - “and/but”
  - d. concession – “and yet, even so”
  - e. condition – “-ing = if/when”
  - f. instrument – “by ...ing”
  - g. witness or exemplification – “and in proof thereof”
  - h. simple conjoining - “and”
  - i. manner or appearance - “-ing, like”

If *-te* really did have such varied semantics, we would have to impose different rules for its segmentation in order to make data treatment crosslinguistically comparable in English and Japanese. For example, cases in English comparable to (a) – (d) above would clearly be instantiations of clause boundaries. On the other hand, examples such as (f) might not be treated as clause boundaries in English. Even more problematic is that some *-te* constructions are ambiguous with respect to the exact category of meaning above.

However, not all linguists agree on the semantics of *-te*. Some say that the meanings specified above are pragmatic interpretations rather than semantic classifications and that there is only one basic meaning. Unfortunately, there is even disagreement on what that basic meaning is. Kuno (1973) and Nakatani (2003), for example, argue that the basic meaning of *-te* is temporal sequence and that others are derived. Hasegawa (1996) argues against the temporal sequence reading and claims that

*-te* marks non-incidental connection between two conjoined events, using as evidence cases where *-te* cannot be employed for basic temporal sequence. Hasegawa also discusses the possibility of a semantically empty *-te*, since its interpretation comes from the constructions either side.

Of particular interest for the purposes of this study, is work done specifically on motion events by Matsumoto (1991; 1996). Of the different kinds of motion verbs in Japanese, which include basic Manner and Path verbs and compound motion verbs containing Manner in the first verb and Path in the second verb, there are also complex motion predicates. These complex motion predicates contain a motion verb with a *-te* suffix followed by a main tensed verb. Matsumoto claims that these *-te* forms are participial forms modifying a main verb. He restricts the verbs that can appear in tensed/final positions in such constructions to deictic motion verbs (*iku*, ‘go’; *kuru*, ‘come’; *irassharu*, ‘go’; *kaeru*, ‘return’). These constructions, he claims, are monoclausal.

Given the controversy surrounding the semantics of *-te* and in order to make segmentation more easily replicable, a rather simple rule for segmentation of spontaneous speech in Japanese was applied. *-te* was considered primarily a simple connector of temporal sequence. Therefore, all instances of verbs ending in the suffix *-te* were segmented as individual clauses, with the exception of those occurring in complex motion predicates consisting of a motion verb, *-te* suffix, and a deictic verb. An example of this system of clause segmentation in Japanese is given in the narrative in (6), describing the Bowling scene. The trade-off of using this system was

crosslinguistic equivalence. For instance, we find examples of instrument or manner semantics expressed as participial forms and included in the same clause as a finite verb in English, but such constructions are mostly absent from the Japanese data. However, since many of the crucial comparisons were intra-language i.e. within Japanese and within English, it was decided that the trade-off was an acceptable one.

(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-wo soko-no toi-ni ue-kara*

bird-Top bowling-Gen ball-Acc that-Gen pipe-to up-from

*otoshite*]

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-wo 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-wo 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’

The narrative in (6) contains twelve clauses in total. Five of these clauses contain mention of the relevant motion events for this scene. Clauses 3 and 4 relate to Bowling Climb and 9, 10 and 12 relate to Bowling Roll. Clause 10 illustrates a complex motion predicate, in which two Path verbs are joined *ochiru* ‘fall’ and *iku* ‘go’. The properties of these clauses were subsequently coded according to the criteria described in later chapters. More examples of verb clauses relevant to each motion event can be found in (7).

(7) Bowling Climb

[*kondo-wa haisui-no kan-no naka-wo tootte*]

‘this time, (he) goes through the inside of the drainpipe’

[*shita-kara kou nobotte-ittara*]

‘when (the cat) goes climbing (to the bird) from the bottom like this’

Bowling Roll

[*de saka-wo kou kudaru-youni*]

‘and it like descends the slope like this’

[*nde sonomama tabun gorogorogoro-tto itte*]

‘and in that way it probably goes rumbling’

Drainpipe Climb

[*soto-no haisuikan-wo kou soto-no-ni tsutatte*]

‘(he) goes along like the outside of the drainpipe and’

[*mata shita-no sakki-to onaji tokoro issshokenmei nobotte-itte*]

‘again, the bottom, (the cat) is going climbing the same place as before with all his might and’

### Rope Swing

[*mukou-no ee mukaikkawa-no biru-no tokoro-made tobouto-shitandesukedo*]

(he) tried to fly to the opposite building

[*sore de ano roopu-de kou taazan mitaini buun-tte mukou-ni tabun mado-ni ikouto*]

‘and then with a rope (he) tries to go probably to the opposite window whoosh like Tarzan’

### **3.5.2 Gesture data treatment**

In addition to speech, this thesis exploits gesture as a methodological tool. Specifically, we are interested in what the semantics of a gesture can tell us about the underlying characterization of the linguistic system. With this goal in mind, the focus of study was the representational gesture stroke, since that is where relevant semantic information may be found. Therefore, although participants produced many kinds of gestures during their narratives, only representational gestures depicting the semantic elements of Manner and/or Path of target motion events were selected for analysis.<sup>7</sup> In order to increase the confidence level with which it could be said that representational gestural movements indeed depicted Manner and Path and were therefore relevant, only

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<sup>7</sup> See Chapter 1 for an overview of gesture types as well as a definition of representational gestures.



gestures minimally co-occurring with clauses containing target motion event speech were coded. In other words, semantics expressed in speech were recruited to interpret semantics expressed in gesture, but not the other way around so as to avoid circularity.

Gestures are extremely complex entities and several recent efforts have focused on identifying and operationalizing their structural composition. Early work by Kendon (1972) identified three typical stages of a gesture. First, there is a “preparation” stage, where gesture articulators, e.g. the hands, are moved (usually raised) from a rest position to the gesture space. The gesture space is generally around chest height, though this can vary by age and culture (McNeill, 1992). The next major stage of a gesture consists of the gesture “stroke.” The stroke reflects the peak of physical effort and serves as the expressive part of the movement, with, for example, semantic information. The stroke is eventually followed by a “retraction”, in which the hands return to a rest position. Additional work, however, has focused on two additional stages: “pre-“ and “post-stroke holds”, where the gesture articulators are held in a stationary position (Kendon, 1972; Kita, van Gijn, & van der Hulst, 1998; Seyfeddinipur, 2006). A single gesticular unit may contain a combination of these features, for example, an initial preparation phase, a series of strokes punctuated by pre-and post-stroke holds, and a final retraction phase. These components are illustrated in Figure 3.2 in a gesture that depicts the Rope Swing event.

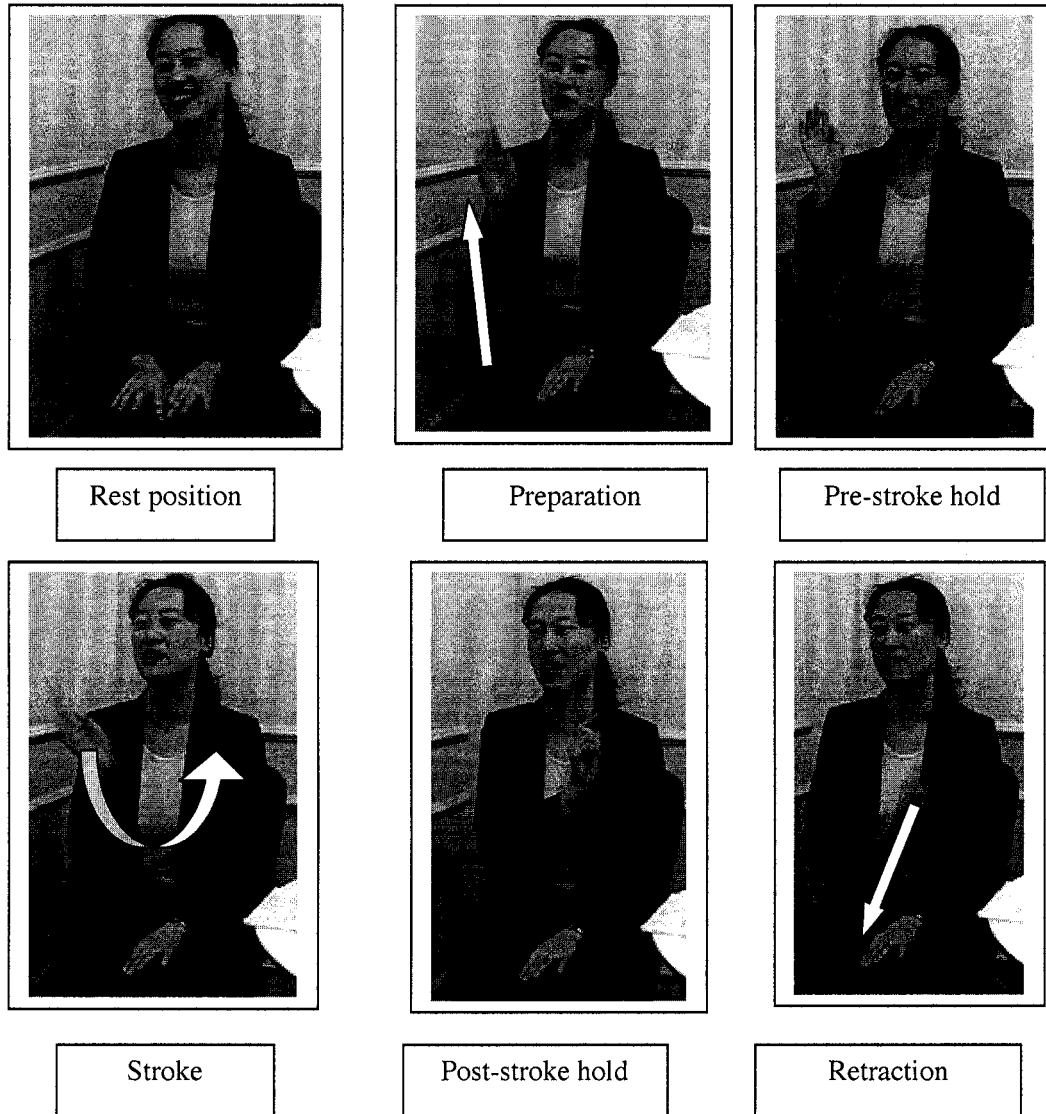


Figure 3.2: *Components of a gesture unit produced in a description of Rope Swing*

The onset and offset of each individual stroke, excluding pre- or post-stroke holds, was identified using a frame-by-frame analysis. Following Seyfeddinipur (2006), the video image was used as a guide for when the hand was in movement during the

stroke, at which time the image was typically blurred, and when the hand was static during a hold, at which time the image was clear. These differences in image clarity can clearly be seen in Figure 3.2. Strokes were then tagged and coded according to criteria relevant for the particular research questions, which are laid out in subsequent chapters. Hereafter, use of the words *gesture* or *stroke* refers interchangeably to *representational gesture stroke*.

It was not unusual for one gesture to be quickly followed by another gesture with no preparation or retraction, or for gesture representations to change partway through a single stroke, e.g. representation of Manner changing to Path. In these cases, each stroke or part of the stroke corresponding to a separate semantic representation was tagged and coded separately. General problematic cases included unclear gestures, where the semantic representation, i.e. Manner, Path or a combination of both, could not be discerned. These gestures were excluded from all analyses. Furthermore, participants typically used their hands to gesture, but occasionally the head or legs were employed. These gestures were included in the analyses provided that their semantic representation was codable.

Just as in the case for speech, segmenting and coding gestures produced in L2 discourse presented its own set of challenges. From a lay view, one might expect learner discourse to be littered with full-blown mimes, as L2 speakers simply gave up all attempts at lexical encoding and shifted to the visual modality. As we know from Gullberg (1998), this is not typically the case. Learners may recruit gesture to facilitate discourse, but this is more likely to be in the form of abstract deictics to overcome

grammatical difficulties or metaphoric gestures with which to hedge the message, for example, as opposed to fully iconic mimes that simply replace speech.

Although perhaps not abundant, we must acknowledge the potential impact of any iconic gestures used to facilitate repair in L2 discourse, which might bias the results relevant for research questions here. Specifically, in terms of describing motion, learners were predicted to have more lexical difficulty with expressing Manner, e.g. *rolling* or *swinging*, than Path, e.g. *across* or *down*. Response to this lexical difficulty might have taken the form of accompanying gestures focusing on only Manner. In such a scenario, analyses examining semantic representation in gesture would be more reflective of online repair strategies and might be less meaningful for gaining insight into the underlying linguistic system.

To control for potential bias in gesture analyses, a procedure by which such strategic gestures could be identified and excluded was implemented following Gullberg (1998), in line with Faerch and Kasper (1983). This procedure involved the assessment of disfluencies on the basis of signs of obvious lexical difficulty, e.g. in the use of paraphrases or circumlocution, or on the basis of “performance features”, the accumulation of which indicated strategic behavior. If at least two “performance features” were simultaneously present in any stretch of discourse, the accompanying gesture was classified as strategic and not analyzed further. These signals included unfilled pauses, filled pauses, slower articulation, mumbling, laughing, message abandonment, self-corrections, repetition, hedges, use of L1, and looks to listener for assistance / confirmation. An example follows in Figure 3.3 of a learner describing the

Bowling Roll event. All gestures depict a rolling motion. The alignment of strokes with speech is indicated by boldface in the text, and the accompanying features signaling disfluency are outlined under the transcript.



[so *the the and then the bowling was **ah kind of** what?*

Performance features signaling disfluency: filled pause, hedging, question intonation, immediate subsequent overt request for help



*nante iu* ('how to say')

Performance features signaling disfluency: use of L1, overt request for help



*rolling with the the cat]*

Not more than two performance features signaling disfluency, so this gesture was tagged and coded

Figure 3.3: Examples of strategic and non-strategic rolling gestures in a learner description of the Bowling Roll event

The example in Figure 3.3 illustrates a clause accompanied by three separate gesture strokes. The first two strokes were aligned with disfluency in speech, signaled by various features, such as pauses, hedging, and overt requests for help. At the time of the last gesture stroke, however, the speaker had found the word she needed, *rolling*, and continued with the clause in a relatively fluent way, albeit with repetition of the article. The final gesture was therefore tagged, coded, and included in analyses.

### **3.5.3 Reliability of speech and gesture data treatment**

To establish reliability of data treatment, 15% of the entire data set was segmented and blind coded by an independent second coder. For L1 speech data, there was 95% agreement on selection of relevant verb clauses for coding. Of these, 100% of clauses received matching speech codes for semantic representation. For L2 speech data, 90% agreement was reached on selection of relevant verb clauses for coding. Of these, 100% of clauses received matching speech codes for semantic representation.

For L1 gesture data, there was 88% agreement on identification of a relevant representational gesture depicting a target motion event, 80% agreement on identification of the stroke, and of the strokes that both coders identified as relevant, there was 94% agreement on semantic code. For L2 gesture data, 85% agreement was reached in identification of a relevant representational gesture depicting a target motion event, 81% agreement was reached on identification of the stroke, and of the strokes that both coders identified as relevant, 79% agreement was reached on the semantic code. Disagreements on semantic code for L2 gesture were largely explained by

differences in whether or not the gesture was considered strategic, and therefore excluded from analyses, as opposed to disagreements on the semantic representation of the gesture itself. In general, disagreements were resolved by accepting the coding of the initial coder.

### 3.5.4 Data analyses

Preliminary analyses showed that neither order of stimulus presentation nor order of language testing affected main results, therefore, the data was collapsed across these variables. Table 3.4 gives an indication of the total size of the corpus by detailing the number of target clauses and the number of target gesture strokes available for analysis in each group.<sup>8</sup>

Table 3.4: *Summary of total number of target clauses and target gesture strokes available for analysis across all groups*

<b>Group</b>	<b>Total # Clauses</b>	<b>Total # Gesture Strokes</b>
Monolingual Japanese (n=16)	108	84
L1 of Native Japanese with L2 English in Japan (n=15)	121	61
L1 of Native Japanese with L2 English in USA (n=13)	97	80
L2 of Native Japanese with L2 English in Japan (n=15)	110	141
L2 of Native Japanese with L2 English in USA (n=13)	97	145
Monolingual English (n=16)	74	67
<b>Total all groups</b>	<b>607</b>	<b>578</b>

Both qualitative and quantitative analyses of the data were conducted. Qualitative analyses included, for example, examinations of specific lexical items used to express Manner and/or Path. Quantitative analyses were used to identify distributional patterns, for example, in lexicalization. Since the variables involved were typically

<sup>8</sup> Clauses or gestures that were coded as unclear are not included in these counts.

nominal and the data set was relatively small with considerable variance, non-parametric statistical tests were employed. In addition, where possible, i.e. in cases of no significant difference between them, data from native Japanese speakers of English resident in Japan and the USA were collapsed to form one group.

The remainder of the dissertation explores language production in three specific areas in the domain of motion events: the expression of Path in monolingual and non-monolingual speech and gesture, the expression of Manner in monolingual and non-monolingual speech and gesture, and the combined expression of Manner and Path in monolingual and non-monolingual speech and gesture. After outlining the literature relevant for each area and the methodology specific to each study, qualitative and quantitative analyses first address research questions for L1 language production. Parallel analyses are then applied to L2 language production. Finally, from the independent pieces of evidence in each chapter, we draw general conclusions about the interaction between the L1 and L2 in the multilingual mind.



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## **Chapter 4: Expression of Path in Monolingual and Non-monolingual Speech and Gesture**

### **4.1 Introduction**

In human understanding of motion, the concepts of Source (point of origin), Path (trajectory), and Goal (destination) are core (Johnson, 1987). It is not unexpected, then, that all languages encode such concepts in some way or another, although the precise ways in which these semantic concepts are mapped onto lexical items varies according to the language. What is somewhat unexpected, however, is the systematicity with which crosslinguistic variation patterns, particularly in expression of Path of motion. According to Talmy's classification (1991), languages fall into one of two categories on the basis of whether they typically lexicalize Path of motion inside the verb or outside the verb. If typological differences can be expected in expression of Path in monolingual language production, the domain can be exploited in order to detect crosslinguistic influences in multilingual language production. If such influences exist and are visible, we can begin characterizing the nature of the relationship between a first and second language.

This study investigates how Path is expressed in elicited narratives from monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English. We investigate whether and how monolingual speakers of each language choose to lexicalize and encode Path, how they distribute Path morphosyntactically in the verb clause, whether and how they include

information about Path in co-speech iconic gestures, and whether and how non-monolingual speakers in L1 and L2 differ from the monolingual baseline in these areas. We begin by outlining what previous research tells us about the expression of Path crosslinguistically and in second language acquisition, followed by what predictions might come out of these findings for both monolingual and non-monolingual language production. We then describe the methodology specific to this study, including details of speech and gesture coding. Finally, we present our results and draw conclusions concerning the implications of crosslinguistic differences in Path expression for our understanding of the interaction between language systems in the multilingual mind.

## **4.2 Background**

### **4.2.1 Expression of Path from a typological perspective**

“Path” of motion was first identified as a key component of a motion event by Talmy (1985). It is defined as the trajectory taken by a “Figure”, the object undergoing translocational motion, which moves with respect to a “Ground”, the reference object for the Figure. In later work, Talmy (1991; 2000) determined Path to be the single core schema of any motion event and argued that languages could be divided into two groups, satellite-framed versus verb-framed, based on their framing of Path. “Satellite-framed” languages, for example, Chinese and all Indo-European languages except Romance, lexicalize core trajectory in satellites. Satellites are defined as constituents in a sister relationship to the verb. In English, satellites are realized as verb particles such as *up* and *down*. The category does not, however, traditionally include prepositional

phrases such as *to*, which require additional noun phrases and are thus not in a sister relationship to the verb. In contrast, “verb-framed” languages, for example, Polynesian, Semitic and Romance languages, lexicalize Path in the verb or verbal elements such as adverbial gerundives. To illustrate, an example is given for English (satellite-framed) and Japanese (verb-framed) below.

- (1) *The ball rolls down the hill*
- (2) *Tama-ga saka-wo kударu*  
 Ball-Nom hill-Acc descend  
 ‘The ball descends the slope’

In the prototypical example (1) from English, *the ball* is the Figure object, *the hill* is the Ground, and Path is lexicalized in the satellite *down*. In a corresponding prototypical example, (2), from Japanese, *tama* ‘ball’ is the Figure object, *saka* ‘hill’ is the Ground, and Path is lexicalized in the verb *kударu* ‘descend’. It is important to note, however, that there are other options for Path lexicalization in both satellite- and verb-framed languages. English, for example, has a number of Path verbs such as *descend*, *ascend*, etc., but, as Talmy observed, most of these are borrowings from Latin, representing a more formal register, and are not characteristic of English. The typology, then, reflects typical preferences in a language as opposed to obligatory constructions mandated by the grammar. Moreover, the prevalence of these typological biases in language usage has been supported by many empirical studies (cf. Gennari, Sloman, Malt, & Fitch, 2002; Naigles, Eisenberg, Kako, Hightler, & McGraw, 1998; Slobin, 1996b).

## 4.2.2 Consequences of lexicalization of Path

Consequences of lexicalization of Path can be seen in a number of areas in both speech and gesture.

### 4.2.2.1 Encoding of Path in discourse

The lexicalization options outlined above have repercussions at the clausal level. Slobin (1996b; 1997a; 1997b) employed elicited narrative data and a written corpus of literary data to compare encoding possibilities in English and Spanish. He found that one way English speakers tended to encode more information about Path than Spanish speakers was through mention of Ground within clauses describing motion.<sup>1</sup> To illustrate, the following example is given.

(3) *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*). Strictly speaking, *into* and *to* are not Path satellites by Talmy’s definition and only introduce Grounds; however,

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<sup>1</sup> 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. description of the context in which the motion took place prior to description of the motion itself, which allow information about Path to be inferred (cf. Slobin, 1996b).

since they do give information about the trajectory followed by the Figure, they were considered expressions contributing to the reading of Path for Slobin's purposes.

Slobin hypothesized that, as English generally locates Path outside the verb, many more Path elements can be tagged on 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; hence, the corresponding Spanish expression would be much heavier, causing Path to be foregrounded and perceptually salient. In his analysis of literary novels, 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, while they employed fewer clauses, speakers of English were observed ultimately to add more locative detail elaborating information about Path in their motion event descriptions than their Spanish-speaking counterparts.

The observations described above in part motivated Slobin's highly influential "Thinking for Speaking" hypothesis. In his words,

*"Thinking for speaking involves picking those characteristics of objects and events that (a) fit some conceptualization of the event, and (b) are readily encodable in the language"* (Slobin, 1996a:76)

In other words, speakers are predicted typically to attend to the aspects of an event that their language has the readily available linguistic means to express. Over time, this habitual attention is predicted to lead to certain rhetorical styles, as evidenced by the literary examples described above.

While we have seen that typological expression of Path is a robust feature of spoken discourse, typological preferences may be overridden by other factors. Wilkins (1997) assessed the influence of society versus the influence of typology on syntactic packaging of Path. Speakers of the Australian aboriginal language Arrernte, like speakers of many aboriginal languages, place great emphasis on the notion of the ‘journey’ based on their way of life as nomadic tribes people. Even though Arrernte lexicalizes Path in the verb slot, Wilkins hypothesized that this cultural focus would manifest itself in expression of more elaborated Paths than the typology of verb-framing typically allows. Indeed, Wilkins found that, equipped with a set of inflections encoding the complex existence of an action occurring against the background of a motion event with a specific orientation in space, Arrernte adults and children build much more complex motion paths than even speakers of English do.

#### **4.2.2.2 Expression of Path in gesture**

The findings presented above on typological expression of Path have further consequences for co-speech gestures. McNeill (1997) proposed that not only are co-speech iconic gestures depicting Path positioned differently crosslinguistically to align with the lexical device carrying Path semantics, but that explicit complexity of Path expression affects the number of Path gestures produced. He observed that English speakers, unpacking complex Paths into individual lexical components (as in *out*, *down*, *out*, and *into* in the example below), produced multiple gestures depicting each component separately. An example of this appears in (4) with square brackets

indicating clause boundaries, underlining indicating Path information in speech, and boldface indicating separate gesture strokes. Here the utterance was accompanied by six separate strokes depicting Path, each numbered, which symbolized different aspects of a complex journey involving four different Path trajectories.

(4) [but it *rolls*<sup>1</sup> *him* *out*<sup>2</sup> *down*<sup>3</sup> the *rain*<sup>4</sup> spout *out*<sup>5</sup> into the sidewalk *into*<sup>6</sup> a *bowling alley*]

<sup>1,2,3,4,5,6</sup> no description of exact nature of gestures given in original text

(adapted from McNeill, 1997:257)

McNeill argued that Spanish speakers, on the other hand, whose depiction of even a complex journey is accomplished through use of a single rather global verb covering the whole event (as in *sale* ‘exit’), produce a single correspondingly global Path gesture, the duration of which may span the entire clause. An example from Spanish, shown in (5), illustrates the case of a complex Path gesture packaged into a single stroke accompanying a single Path expression in speech.

(5) [y *sale* *volando*<sup>1</sup>]

and exits flying

‘and flies out’

<sup>1</sup> hand moves back, down, arcs left and curves upward and forward, all in one continuous movement

(adapted from McNeill, 1997:257)

In examination of the same topic, Stam (1998; 2006a) corroborated but also refined crosslinguistic observations for positioning of Path gestures in Spanish and



English. First, Stam noted the predominant consistency with which native Spanish speakers positioned Path gestures over verbs (see McNeill & Duncan, 2000 for similar findings). This temporal alignment is logical given that the verb slot is typically reserved for Path semantics in Spanish. However, many Path gestures in Spanish coincided with a category of *other* elements, in line with McNeill's idea of a blanketing of gesture over the entire clause. Native English speakers were observed to accumulate Path gestures within the clause, but exhibited much more variation as regards positioning, with Path gestures positioned over a variety of spoken elements (e.g. verbs, particles/prepositions, and Ground noun phrases), although many gestures were aligned with constituents including particles/prepositions. This pattern is also logical given the diffuse nature of encoding of Path within the clause in English, although not all the spoken elements aligned with Path gestures encoded Path themselves.

While typological preferences may be overridden in certain exceptional circumstances, research shows that robust crosslinguistic differences exist in spoken and gestured encoding of Path of motion in a first language.

#### **4.2.2.3 Acquisition of Path in a second language**

In second language acquisition, it appears that expression of Path is a problematic area for learners as evidenced by production studies of both speech and gesture. Cadierno (2004) found that intermediate and even advanced Danish learners of Spanish, in moving from a satellite- to a verb-framed language, used fewer verb types in their L2 than in their L1 and fewer than Spanish native speakers to express motion.

Furthermore, the intermediate learners attempted to elaborate Path in a rather redundant way in their L2 by adding directional Path adverbs to verbs already encoding Path semantics, a process that Cadierno labeled “satellization.” She likened this to the U-shaped pattern of development exhibited in L1 acquisition, also characterized by redundant encoding of Path (Berman & Slobin, 1994), but concluded that similar patterns in the source L1 to those in the L2 suggested the existence of L1 transfer.

Likewise, Negueruela, Lantolf, Jordan, and Gelabert (2004) observed highly proficient native English speakers of L2 Spanish and highly proficient native Spanish speakers of L2 English, who, despite their proficiency in the L2, all exhibited L2 patterns reflecting L1 lexicalization. For example, L1 English speakers produced multiple prepositional phrases to express complex trajectories in L2 Spanish, and L1 Spanish speakers encoded Path in non-target-like verbs in L2 English. Parallel results were found in Stam (2006b) and Navarro & Nicoladis (2005).

Yet second language production cannot wholly be characterized in terms of L1 transfer. In a longitudinal case study of an adult Spanish-speaking learner of French as a second language, Giacobbe (1992) found significant L2 use of adverbials to express Path. However, since both Spanish and French are verb-framed languages, adverbial use was a prominent feature of neither the source nor target language. This along with a similar phenomenon in L1 acquisition (Berman & Slobin, 1994) suggests that increased use of satellites in learner production is a universal feature of interlanguage.

Several studies examining L1 transfer in spoken expression of Path provide evidence suggesting consequences for gesture. Again, Negueruela et al. (2004)

described how L1 English speakers aligned gestures depicting Path with non-verb elements in L2 Spanish, and L1 Spanish speakers aligned Path gestures with verbs in L2 English. This is an interesting observation, since there is little or no linear distance between verbs and particles/prepositions in either English or Spanish, which raises the issue of exactly what constituted a gesture in this study and on what criteria gestural boundaries were drawn. Similarly, Stam (2006a; 2006b) found that both intermediate and advanced Spanish learners of English exhibited mixed patterns of gesture alignment in their L2, somewhere between the source and target. Furthermore, learners in general did not display the accumulation of Path gesture seen to a slightly greater extent in native English discourse and followed their L1 Spanish patterns in this respect.

However, it is not exactly clear whether the results above indicate transfer of patterns in speech with consequences manifest in gesture or transfer of gesture patterns alone. Indeed, Kellerman and van Hoof (2003) show that not all L2 gesture patterns can be explained as simple transfer phenomena. In their study of Spanish and Dutch learners of English, predictable patterns were found among Spanish-speaking learners of English, where Path gestures in the L2 were synchronized with verbs. Unexpectedly, English learners with L1 Dutch also synchronized Path gestures with verbs in the L2, a pattern not characteristic of their satellite-framed L1. While transfer cannot explain this finding, the authors did not commit to an alternative explanation, but suggested the possible existence of a universal interlanguage structure in this area. However, a universal interlanguage pattern of Path gesture alignment with Path verbs is somewhat

at odds with Giacobbe's (1992) suggestion that universal interlanguage characterizes prominent usage of Path satellites.

In addition to the above debate concerning which aspects of L2 production constitute evidence of L1 transfer and which constitute evidence of interlanguage, two additional problems exist in previous L2 studies in this area: proficiency level and sample size. It is notoriously difficult to measure proficiency accurately in the first place, and at least for English, numerous measures are available, which actually makes comparability across studies rather difficult. Cadierno (2004) and Negueruela et al. (2004) estimated proficiency on the basis of language background, while Kellerman and van Hoof (2003) did not address the issue at all, though one can infer from their participant pool that many of the speakers were rather proficient (i.e. Dutch university students). While Stam (2006a; 2006b) controlled rather carefully for proficiency in English, there were only five participants in each group. Similarly, in Negueruela et al. three participants constituted each group and Giacobbe's (1992) findings were based on a single case study, which makes generalization rather difficult. Kellerman and van Hoof and Cadierno, on the other hand, included seven and eight participants per group respectively, which enables rather more generalization, provided the groups were homogenous in terms of proficiency.

### 4.2.3 Summary

As we have seen, lexicalization of Path varies systematically across languages, typically inside or outside the verb. This has consequences both for morphosyntactic distribution of Path information in the verb clause, leading to accumulation of Path expressions, and for co-speech iconic gestures, resulting in alignment of Path gestures with specific morphosyntactic elements and accumulation of Path gestures. There is also evidence that in second language acquisition, typologically established patterns are transferred from the L1 to the L2 in speech with potential consequences for gesture. Although with the issues of proficiency level and sample size mentioned above, the picture here is perhaps not quite as clear as we would like. In general, however, typological preferences in motion event construal appear to be rather intransient features of a first language.

English and Japanese, the specific languages employed in this study, differ typologically in fundamental ways; thus, we have sufficient grounds to expect considerable differences in monolingual baseline expression of Path. We also have reason to believe that when two typologically different systems for expressing Path come into contact within one speaker, they will interact. This has been confirmed for L2 production (although not specifically for Japanese learners of English), but has not yet been investigated in the L1 production of those who are acquiring a second language. We turn, therefore, to what we might predict for both the L1 and L2 production of native Japanese speakers with intermediate knowledge of English.

### 4.3 Predictions

Assuming the existence of crosslinguistic influence in the domain of Path expression and on the basis of the research summarized above, the following predictions are postulated for our three populations: monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in their L1 and L2. These predictions are subsequently summarized in Table 4.1. It is important to note that predictions for the non-monolingual speakers are effectively educated guesses. While we know something about how L2 expression of Path is affected by the L1, we know nothing about how L1 expression of Path might be affected by an L2. Therefore, the predictions outlined below generally reflect the expectation that non-monolingual expression of Path in L1 and L2 will be somewhere between monolingual expression of Path in Japanese and English, as is often the case in specific L2 studies.

Prediction 1: Lexicalization of Path: which morphosyntactic resources are employed to map Path semantics

*Monolingual Japanese speakers:* are predicted to lexicalize Path primarily in the verb.

*Monolingual English speakers:* are predicted to lexicalize Path primarily outside the verb in adverbials (satellites and prepositions).

*Non-monolingual Japanese speakers in L1:* are predicted to exhibit mixed patterns of lexicalization, in verbs and adverbials.

*Non-monolingual Japanese speakers in L2:* are also predicted to exhibit mixed patterns of lexicalization, in verbs and adverbials.

Prediction 2: Morphosyntactic distribution of Path information within the clause: whether Path expressions are accumulated in the clause

*Monolingual Japanese speakers:* are predicted not to concatenate Path expressions within the clause.

*Monolingual English speakers:* are predicted to concatenate Path expressions within the clause.

*Non-monolingual Japanese speakers in L1:* are predicted to concatenate some Path expressions within the clause (more than monolingual Japanese speakers).

*Non-monolingual Japanese speakers in L2:* are predicted to concatenate some Path expressions within the clause to some degree (less than monolingual English speakers).

Prediction 3: Encoding of Path in narrative: the extent to which Path is explicitly mentioned

*Monolingual Japanese speakers:* are predicted to exhibit ceiling level inclusion of Path in narrative since Path is the core schema of a motion event.

*Monolingual English speakers:* are also predicted to exhibit ceiling level inclusion of Path in narrative.

*Non-monolingual Japanese speakers in L1:* are predicted to pattern in the same way as both groups of monolinguals.

*Non-monolingual Japanese speakers in L2:* are predicted to include Path most of the time, though this may be constrained due to lexical or processing difficulties.

Prediction 4: Alignment of Path gesture: which morphosyntactic resources Path gestures are aligned with.

*Monolingual Japanese speakers:* are predicted to align Path gestures primarily with verbs.

*Monolingual English speakers:* are predicted to align Path gestures with a range of morphosyntactic devices, which generally include adverbials.

*Non-monolingual Japanese speakers in L1:* are predicted to align Path gestures with a range of morphosyntactic devices, which may be equally divided between verbs and adverbials.

*Non-monolingual Japanese speakers in L2:* are predicted to align Path gestures with a range of morphosyntactic devices, which may be equally divided between verbs and adverbials.

Prediction 5: Numbers of Path gestures: the extent to which Path gestures are accumulated within the clause.

*Monolingual Japanese speakers:* are predicted not to accumulate Path gestures within the clause.

*Monolingual English speakers:* are predicted to accumulate Path gestures within the clause.



*Non-monolingual Japanese speakers in L1:* are predicted to accumulate Path gestures within the clause to some degree (more than monolingual Japanese speakers).

*Non-monolingual Japanese speakers in L2:* are also predicted to accumulate Path gestures within the clause to some degree (less than monolingual English speakers).

Table 4.1: Summary of predictions for expression of Path (P) in speech and gesture in monolingual Japanese speakers, native Japanese speakers with intermediate knowledge of English in L1 and L2, and monolingual English speakers.

Predictions	Mono Japanese	Non-mono Japanese (L1)	Non-mono Japanese (L2)	Mono English
Lexicalization of P in verb	✓	✗/✓	✗/✓	✗
Lexicalization of P in adverbial	✗	✗/✓	✗/✓	✓
Concatenation of P within clause	✗	✗/✓	✗/✓	✓
Inclusion of P in narrative	✓	✓	✗/✓	✓
Alignment of P gestures with verb	✓	✓	✓	✓
Alignment of P gestures with adverbial	✗	✗/✓	✗/✓	✓
Accumulation of P gesture within clause	✗	✗/✓	✗/✓	✓

## 4.4 Method

### 4.4.1 Participants

A total of 57 participants were included in the analyses involved in this study: 13 monolingual English speakers, 16 monolingual Japanese speakers, and 28 native Japanese speakers with intermediate knowledge of English. All of these individuals described the target motion events in speech. A subset of the participants also produced gestures accompanying their spoken descriptions. Speech and gesture data were

analyzed separately. Biographical information for these groups can be found summarized in the general methodology section in Chapter 3 and detailed in Appendix I.

#### **4.4.2 Stimuli**

Explanations and screen shots of these animated motion events can be found in the general methodology section in Chapter 3 and in Appendix II.

#### **4.4.3 Procedure**

The procedure for data collection was as laid out in the general methodology section in Chapter 3.

#### **4.4.4 Speech Coding**

Spontaneous speech was segmented into verb clauses following the procedure described in Chapter 3. After isolating those clauses that described the target motion events, narratives were coded for expression of Path at three levels: word, clause, and event description. Coding of Path speech was initially conducted at the word level. Although we began with Talmy's (1991) typology of verb-framing versus satellite-framing in lexicalization of Path, coding of Path elements in discourse for our purposes went rather far beyond these original specifications. Thus, all lexical elements encoding information about the trajectory followed by the Figure were coded as Path, including directional adpositional phrases and deictic verbs. Identification of Path semantics in a

single word or expression can be problematic, and the current coding scheme was modeled on coding schemes outlined in previous studies on motion events (e.g. Jensen, 2002; Kita & Özyürek, 2003; Slobin, 1996b; 1997a; 2004; Weingold, 1992, 1995). A full list of lexical items coded as Path for each target motion event is displayed in Appendix III.

In coding Path at the individual word level, the following guidelines were employed. Morphologically complex words in Japanese composed of a Manner component and Path component e.g. *tobi~komu* ‘fly~enter.in’, were divided, and the Path component was coded separately. Japanese enter and exit 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’, since Kita (1999) claims that these verbs in their bare forms express discrete changes of state without motion semantics. In English, *in* was interpreted as either the colloquial short version of *into* or *inside* and was also coded as Path as long as these were used adverbially to express motion, e.g. *went in/inside/into*, and not location, e.g. *be in/inside*.

A second level of coding was conducted at the clausal level and determined how many Path expressions appeared in each verb clause. Examples of this from the descriptions of Bowling Roll in English and Japanese appear in (6) and (7) with clause boundaries indicated by square brackets and Path expressions underlined.<sup>2</sup>

(6) [and goes rolling down the street into a bowling alley]

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<sup>2</sup> Descriptions of each of the stimuli, e.g. Bowling Roll, appear in Chapter 3 and Appendix II.

- (7) [*neko-wa sakamichi-wo korogatte ikimashita*]  
 cat-Top hill-Acc roll.Con went

Lit: 'the cat went rolling on the hill'

In example (6) from English, there are two Path expressions: *down* and *into*. Example (7) from Japanese, however, contains only one overt Path expression embedded in a complex motion predicate: *iku* 'go'.<sup>3</sup>

Finally, individual narratives were coded for whether Path was mentioned in descriptions of target motion events or not. Results for speech analyses can be found in section 4.5.

#### 4.4.5 Gesture Coding

Iconic gesture strokes were isolated according to the procedure laid out in Chapter 3. Gestures were coded as Path-only gestures if the gesture articulator(s) exhibited relatively straight translocational movement without concurrent movement that could be interpreted as depicting simultaneous depiction of Manner. Additional or concurrent depiction of Manner in gesture with respect to the target motion events might consist of wiggling of fingers, rotating of wrist or arm, or the portrayal of a climbing action. In gestured descriptions of Rope Swing, arc-shaped gestures were excluded from Path-only gesture analyses, as it was decided that the arc shape reflected

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<sup>3</sup> Native Japanese speakers may argue that this sentence contains directional information other than that conveyed by *iku* 'go'. This may be due to the special status of *korogaru* 'roll', which is discussed in footnotes 4 and 10 in Chapter 6. For the purpose of the chapter, without a postposition, *korogaru* with an associated Ground phrase was not coded as having explicit Path semantics.

the Manner component (swinging action) of these motion events.<sup>4</sup> Figure 4.1 shows stills of a typical Path-only gesture produced in a description of Bowling Roll. In producing this gesture, the speaker's left hand traced a lateral, left to right trajectory (from the speaker's perspective), while the right hand was held in place.



Figure 4.1: *Stills from the production of a Path gesture in the description of Bowling Roll*

Analyses of Path gestures consisted of identifying the lexical items broadly aligned with the stroke of the Path-only gesture.<sup>5</sup> In the common case of partial temporal overlap, the gesture was coded as overlapping with the whole word. In addition, the number of Path-only gestures was counted within a single clause to reflect elaboration of Path expression in gesture. Arguably elaboration of Path in gesture could also come in the form of simultaneous Manner-Path conflated gestures, since these also have a Path component. However, in order to follow procedures employed in previous studies and therefore to make findings comparable, such gestures were excluded from the current analyses. Examples of these coding processes as applied to clauses

<sup>4</sup> Arc trajectory gestures are discussed in Chapter 6 on combination of Manner and Path.

<sup>5</sup> The term “broad alignment” is used here to indicate that analyses did not focus on extremely tight temporal relationships between gesture and very specific phonetic segments in speech, but looked more broadly at the constituents co-occurring with the gesture.

describing Bowling Roll appear below with individual gesture strokes indicated by boldface and numbered, and Path expressions underlined.

- (8) [**gorogoro**    **gorogoro**<sup>1</sup>-to            **korogatte**<sup>2</sup>    itte<sup>3</sup>]  
 Mimetic            Mimetic -comp            roll.Con            go.Con

Lit: '(It) goes rolling RUMBLE RUMBLE'

<sup>1</sup> Simultaneous Manner-Path gesture: hand rotating while moving along a trajectory, excluded from further analysis here

<sup>2</sup> Manner gesture: hand rotating in place with no movement along a trajectory, excluded from further analysis here

<sup>3</sup> Path gesture: hand moving along a trajectory with no rotation of hand, aligned with a Path verb

- (9) [*de*    *sonomama*    *toori-wo*    **koro**<sup>1</sup>**gatte**<sup>2</sup>]  
 and    in.that.way    street-Acc    roll.Con

Lit: 'and (it) rolls on the street in that way'

<sup>1</sup> Path gesture: hand moving along a trajectory with no rotation of hand, aligned with non-Path information in speech (conjunction + adverb + Ground noun phrase) as well as part of a Manner verb

<sup>2</sup> Path gesture: hand moving along a trajectory with no rotation of hand, aligned with part of a Manner verb

In example (8), the verb clause is accompanied by three separate gesture strokes, but only the third is a Path-only gesture. The Path gesture in this clause is aligned with a Path verb. Example (9) shows a verb clause with two gesture strokes,

both of which are Path-only gestures. One is aligned with a variety of semantic components and part of a Manner verb; the other is aligned with the rest of the Manner verb. In cases where the gesture overlapped with part of a word, as in the case of (9), each gesture was coded as overlapping with the whole lexical item, in this case a verb. Results for Path gesture analyses can be found in section 4.5.

#### **4.5 Results**

As discussed in Chapter 3, non-parametric procedures were used for all quantitative analyses. Results are divided into five major sections. We first present results from a number of analyses of L1 production in speech (section 4.5.1) and gesture (section 4.5.2). For these analyses, three main groups are compared: monolingual Japanese speakers (J), monolingual English speakers (E), and native Japanese speakers with intermediate knowledge of English in their L1 (J (E)). Second, we present results of analyses of L2 production in speech (section 4.5.3) and gesture (section 4.5.4). For these analyses, native Japanese speakers with intermediate knowledge of English, this time in their L2 (E (J)), were compared to each of the monolingual groups: (E) and (J). Finally, within-subject analyses were conducted on the non-monolingual Japanese group in order to compare production of speech and gesture in their L1 and L2 (section 4.5.5). Prior to all quantitative analyses, the non-monolingual Japanese group resident in Japan was compared to its counterpart resident in the USA, and in the event of no differences between them, the data were collapsed to form one group of native Japanese speakers with intermediate knowledge of English.

Results are presented in this way, at the expense of some repetition, in order to be maximally clear on the languages involved in each analysis and also due to the fact that the non-monolingual L1 and L2 data had to be compared to the monolingual data in separate statistical tests, followed by final repeated measures tests to compare L1 and L2 language production within individuals.

#### **4.5.1 Expression of Path in L1 speech**

Three different sets of analyses at the levels of word, clause and discourse were conducted to investigate the expression of Path in speech in first language narrative production. First, we explored how Path was lexicalized in narrative in the L1. Second, we identified the extent of Path concatenation in the verbal clause in the L1. Third, we measured how often Path was included in narrative in the L1.

##### **4.5.1.1 Lexicalization of Path in L1 narrative**

In the analysis of Path lexicalization, two possible patterns were distinguished: verb and adverbial. Table 4.2 illustrates the use of each of these lexical categories by listing lexical types employed by each group.



Table 4.2: *Lexical types used to express Path across all events in L1 groups*

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
P verb types	<i>agaru</i> 'rise' <i>hairu</i> 'enter' <i>iku</i> 'go' <i>komu</i> (only in compound form) 'into' <i>kudaru</i> 'descend' <i>kuru</i> 'come' <i>nerau</i> 'aim' <i>noboru</i> 'climb' <i>noru</i> (only in compound form) 'onto' <i>ochiru</i> 'fall' <i>shinnyuu-suru</i> 'invade' <i>tai~suru</i> 'go toward' <i>tooru</i> 'go along' <i>tsutau</i> 'go through' <i>tsutawaru</i> 'go through' <i>utsuru</i> 'move' <i>wataru</i> 'cross' <i>yaru</i> 'be transmitted'	<i>agaru</i> 'rise' <i>hairu</i> 'enter' <i>idou-suru</i> 'move' <i>iku</i> 'go' <i>komu</i> (only in compound form) 'into' <i>kuru</i> 'come' <i>mezasu</i> 'go toward' <i>mukau</i> 'go toward' <i>nerau</i> 'aim' <i>noboru</i> 'climb' <i>nukeru</i> 'go through' <i>ochiru</i> 'fall' <i>oriru</i> 'decend' <i>shinnyuu-suru</i> 'invade' <i>tadoritsuku</i> 'arrive' <i>tooru</i> 'go along' <i>tsutau</i> 'go through' <i>tsutawaru</i> 'be passed along' <i>utsuru</i> 'move' <i>ugoku/ugokasu</i> 'move/be moved' <i>utsuru</i> 'move'	<i>agaru</i> 'rise' <i>chikazuku</i> 'approach' <i>hairu</i> 'enter' <i>iku</i> 'go' <i>komu</i> (only in compound form) 'into' <i>kuru</i> 'come' <i>massigura</i> 'go toward' <i>noboru</i> 'climb' <i>ochiru</i> 'fall' <i>shinnyuu-suru</i> 'invade' <i>tadoritsuku</i> 'arrive' <i>tooru</i> 'go along' <i>toutatsu-suru</i> 'arrive' <i>tsutau</i> 'go through' <i>tsutawaru</i> 'be passed along' <i>utsuru</i> 'move' <i>yaru</i> be transmitted'	<i>come</i> <i>get</i> <i>go</i>
P adverbial types	<i>he</i> 'to' <i>kara</i> 'from' <i>made</i> 'until/to' <i>ni</i> 'to' <i>zu-to</i> 'all the way'	<i>he</i> 'to' <i>kara</i> 'from' <i>made</i> 'until/to' <i>ni</i> 'to' <i>zu-to</i> 'all the way'	<i>he</i> 'to' <i>kara</i> 'from' <i>made</i> 'until/to' <i>ni</i> 'to' <i>zu-to</i> 'all the way'	<i>across</i> <i>all the way</i> <i>along</i> <i>back</i> <i>behind</i> <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>
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As we can see above, all groups employed both verbs and adverbial elements to encode Path; however, the differing number of lexical types appearing in each language is a clear indication that lexicalization patterns differ. More specifically, monolingual speakers of English employed a greater variety of adverbial expressions, while lexical diversity in both monolingual and non-monolingual Japanese discourse was observed in verbs. Moreover, counter to predictions, there was little quantitative or qualitative difference in the number of lexical types employed by native Japanese speakers with knowledge of English and monolingual Japanese speakers.

#### **4.5.1.2 Morphosyntactic distribution of Path within the L1 clause**

Given that speakers of both languages patterned as predicted with respect to lexicalization of Path and that adverbial elements lend themselves particularly well to accumulation within the clause, monolingual English speakers were predicted to concatenate adverbial expressions to a greater extent than monolingual speakers of Japanese. Table 4.3 illustrates the mean number of Path expressions (all kinds) per clause in verb clauses expressing Path across L1 groups.

Table 4.3: Mean number (SD) of Path expressions (verbs and adverbials) per clause employed in all clauses containing Path across L1 groups

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
P expressions	1.85 (.25)	2.05 (.24)	2.01 (.32)	1.58 (.31)

A Mann-Whitney U test showed no significant difference between the two sub-groups of non-monolinguals, i.e. those resident in Japan versus the USA ( $z = -.717$ ,  $p = .474$ ). In the absence of a difference, these two sub-groups were collapsed for the subsequent analyses to form one group of non-monolingual Japanese speakers performing in their L1 (J (E)).

Figure 4.2 shows an error bar plot illustrating the mean number of Path expressions per clause in all clauses containing Path across the three main L1 groups.

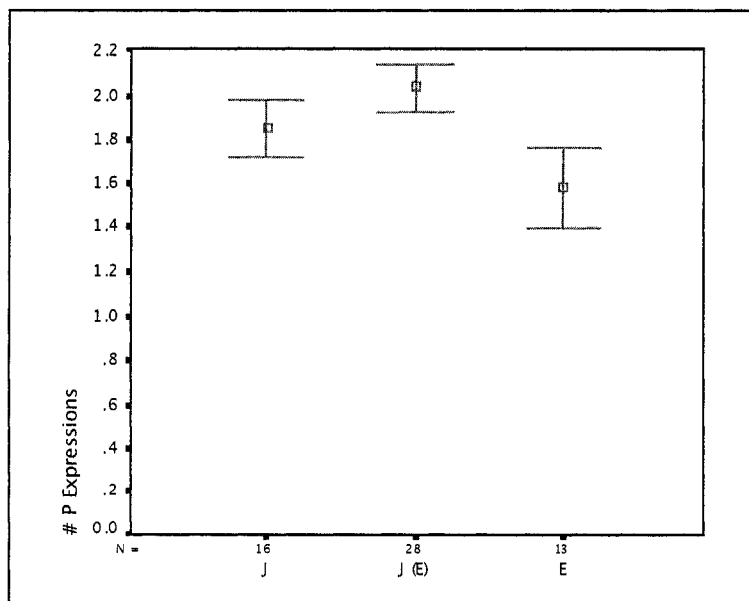


Figure 4.2: Mean number of Path expressions per clause in all clauses containing Path across three L1 groups: J (monolingual Japanese speakers), J (E) (native Japanese speakers with intermediate L2 English resident in Japan and the USA), and E (monolingual English speakers)

A Kruskal-Wallis test showed a significant difference in the mean number of Path expressions per clause between groups:  $\chi^2(2, N=57) = 16.692, p < .001$ . Follow-up tests showed, rather surprisingly, that monolingual Japanese speakers concatenated significantly more Path expressions within the clause than monolingual English speakers. However, the combined group of Japanese speakers with intermediate L2 English exhibited the greatest number of Path expressions per clause, concatenating significantly more Path expressions than their monolingual Japanese counterparts and monolingual English speakers. Considering that this result was quite unexpected, a number of post-hoc analyses were conducted for further investigation.

As seen in examples (2) and (7) previously, Japanese speakers were predicted to lexicalize Path in verbs following the verb-framed pattern. However, there are alternatives for Path encoding available to speakers of Japanese. A range of possibilities taken from descriptions of the climbing events is given below in (10) – (13), with Path elements underlined.

- (10) *neko-ga amadoi-no naka-wo tsutatte*  
 cat-Nom drainpipe-Gen inside-Acc go.along.Con

Lit: 'the cat goes along the inside of a drainpipe'

- (11) *tori-no tokoro-ni ikouto*  
 bird-Gen place-to try.to.go

Lit: '(the cat) tries to go to the bird's place'

- (12) *haisuikan-no naka-wo toori-nukete*  
 drainpipe-Gen inside-Acc go.along-go.through  
 Lit: '(the cat) goes along going through the inside of the drainpipe'
- (13) *chiyou-kara Tweety-no tokoro-made nobotte itta*  
 ground-from Tweety-Gen place-to climb.ascend.Con went  
 Lit: "(He) went climbing from the ground to Tweety's place"

Example (10) from a monolingual Japanese speaker illustrates the canonical verb-framed pattern, a clause with one Path expression in the verb *tsutau* 'go along'. The item *naka* 'inside' is not coded as Path in Japanese because it is a spatial noun marked as a direct object of the verb by the particle *wo*, and spatial nouns were not included in Path coding. Examples (11) and (12) from native Japanese speakers with intermediate knowledge of English show clauses with two Path expressions: in the first, the verb *iku* 'go' and the postposition *ni* 'to', and in the second, the compound verb combining *tooru* 'go along' and *nukeru* 'go through'. The final example in (13), also from a native Japanese speaker with intermediate knowledge of English, however, contains four Path expressions: two postpositions, *kara* 'from' and *made* 'to', and a complex motion predicate consisting of two verbs, *noboru* 'climb.ascend' and *iku* 'go'.<sup>6</sup> Clearly, with the existence of postpositions as well as complex motion predicates and compound verbs, Japanese speakers can quite easily concatenate Path expressions to a greater degree perhaps than speakers of other verb-framed languages, and actually do so to a greater degree than the monolingual English speakers observed here. However,

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<sup>6</sup> For discussion of complex motion predicates, see Chapter 3. And for discussion of the verb *noboru* 'climb.ascend', see Appendix III.

while this may explain the difference between the monolingual groups, it does not explain the intra-language difference between monolingual and non-monolingual Japanese speakers. In order to address this question, a post-hoc analysis calculating the actual number of verbs and adverbials used in each clause was conducted. Table 4.4 summarizes the mean number of verbs and the mean number of adverbials per clause across L1 groups.

Table 4.4: Mean number (SD) of Path verbs and Path adverbials per clause in all clauses containing Path across L1 groups

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
# P verbs	1.24 (.19)	1.27 (.15)	1.21 (.17)	.28 (.19)
# P adverbials	.61 (.18)	.78 (.29)	.80 (.31)	1.30 (.22)

A Mann-Whitney U test showed no significant differences between the two sub-groups of non-monolinguals for number of Path verbs ( $z = -.811$ ,  $p = .417$ ) or for number of Path adverbials ( $z = -.046$ ,  $p = .963$ ). Therefore, these two sub-groups were collapsed to form one group of non-monolingual Japanese speakers performing in their L1 (J (E)).

Next, two separate analyses were conducted to evaluate differences between language groups in production of each option for Path lexicalization. Figure 4.3 shows an error bar plot illustrating mean number of Path verbs per clause in all clauses containing Path across the three main L1 groups.

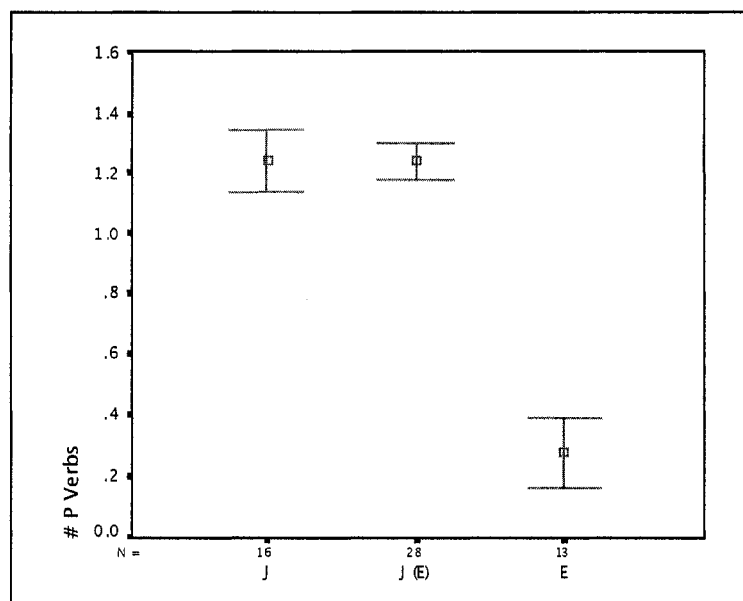


Figure 4.3: Mean number of Path verbs per clause in all clauses containing Path across three L1 groups: J, J (E) and E

A Kruskal-Wallis test showed a significant difference in the mean number of Path verbs per clause between groups:  $\chi^2(2, N=57) = 29.741, p < .001$ . Follow-up tests revealed that, as expected, monolingual English speakers produced significantly fewer Path verbs per clause than both groups of Japanese speakers. However, there was no difference between monolingual and the combined group of non-monolingual Japanese speakers. This means that non-monolingual Japanese were not using the options illustrated in (12) and (13) of compound verbs or complex motion predicates to pack more Path expressions per clause than their monolingual Japanese counterparts.

Figure 4.4 shows an error bar plot illustrating mean number of Path adverbials per clause in all clauses containing Path across the three main L1 groups.

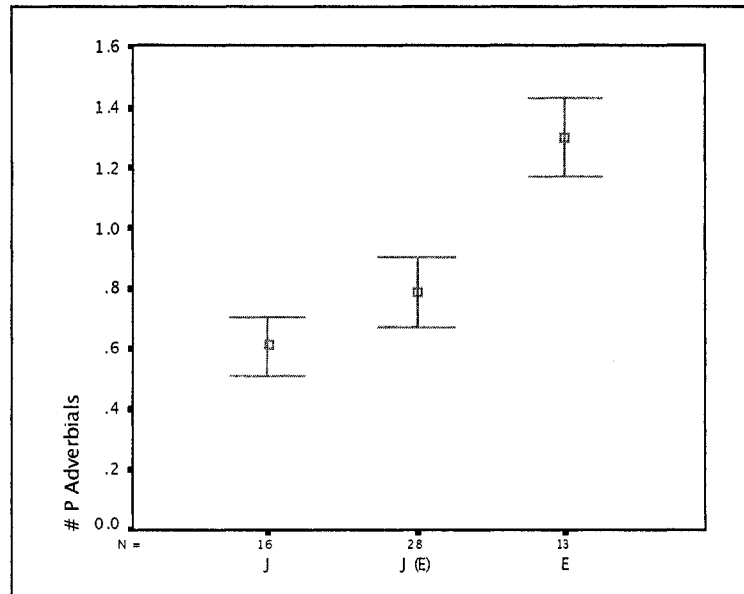


Figure 4.4: Mean number of Path adverbials per clause in all clauses containing Path across three L1 groups: J, J (E), and E

A separate Kruskal-Wallis test showed a significant difference in the mean number of Path adverbials between groups:  $\chi^2(2, N=57) = 26.841, p < .001$ . Follow-up tests revealed that monolingual English speakers produced significantly more Path adverbials per clause than both groups of Japanese speakers, but this time also that the combined group of non-monolingual Japanese speakers produced significantly more Path adverbials per clause than monolingual Japanese speakers.

Therefore, non-monolingual Japanese speakers exhibited a greater number of Path expressions per clause than either monolingual group with increased use of postpositions in their L1, which allow concatenation in the clause much like participles and prepositions do in English. Unlike participles in English, however, Japanese postpositions encode only either Source or Goal of motion as opposed to intermediate trajectory. Hence, a final post-hoc analysis was undertaken to compare encoding of



Source and Goal in motion events descriptions in order to fully understand the differences between monolingual and non-monolingual production in Japanese.

Table 4.5 summarizes mean numbers of adverbials encoding Source and Goal of motion per clause across L1 groups. As there were also a fair number of verbs encoding Goal of motion, e.g. *tadoritsuku* 'arrive' and *get*, but no verbs encoding Source, an additional analysis of combined verb and adverbial per clause usage to encode Goal was conducted.

Table 4.5: Mean number (SD) of Source and Goal adverbials per clause employed in all clauses containing Path across L1 groups.

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
# Source Adverbials	.17 (.21)	.16 (.11)	.26 (.23)	.03 (.07)
# Goal adverbials	.42 (.14)	.56 (.26)	.55 (.26)	.29 (.22)
# Goal verbs + adverbials	.42 (.14)	.61 (.30)	.58 (.26)	.37 (.23)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of non-monolinguals for number of Source adverbials ( $z = -.880$ ,  $p = .379$ ), for number of Goal adverbials ( $z = -.162$ ,  $p = .872$ ), or for number of Goal verbs + adverbials ( $z = -.646$ ,  $p = .518$ ). Therefore, these two sub-groups were again collapsed, (J (E)).

Subsequently, three separate analyses were conducted to evaluate differences between language groups in encoding of Source and Goal. Figure 4.5 shows an error

bar plot illustrating mean number of Source adverbials per clause in all clauses containing Path across the three main L1 groups.

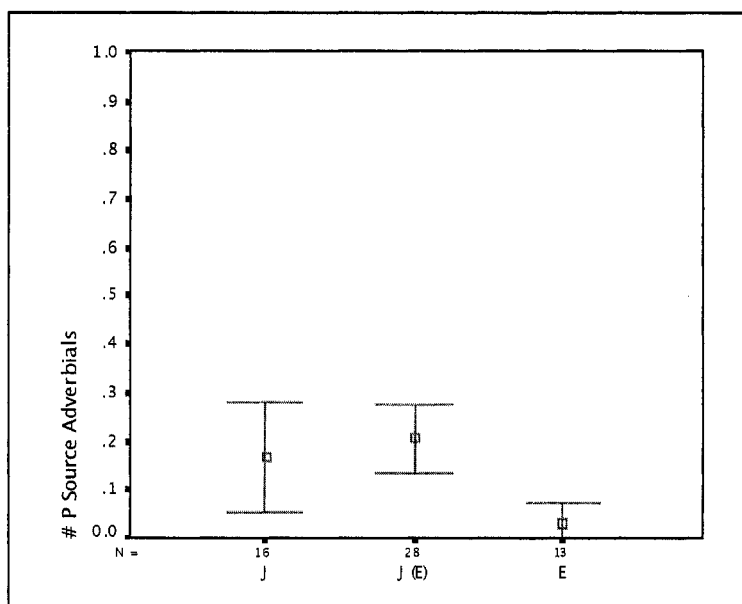


Figure 4.5: Mean number of Source adverbials per clause in all clauses containing Path across three L1 groups: J, J (E) and E

A Kruskal-Wallis test showed a significant difference in the mean number of Source adverbials per clause between groups:  $\chi^2(2, N=57) = 11.419, p = .003$ . Follow-up tests revealed that the combined group of non-monolingual Japanese speakers encoded Source of motion significantly more often than monolingual English speakers. However, no further significant differences were found, i.e. between monolingual English and Japanese groups or between non-monolingual and monolingual Japanese speakers.

Figure 4.6 shows an error bar plot illustrating mean number of adverbials encoding Goal per clause in all clauses containing Path across the three main L1 groups.

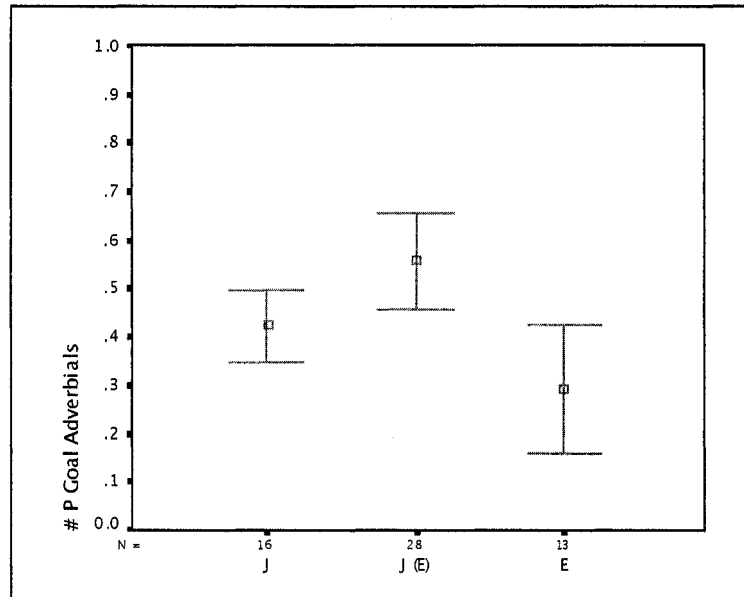


Figure 4.6: Mean number of Goal adverbials per clause in all clauses containing Path across three L1 groups: J, J (E), and E

A second Kruskal-Wallis test showed another significant difference in the mean number of adverbials encoding Goal per clause between groups:  $\chi^2(2, N=57) = 10.880$ ,  $p = .004$ . Follow-up tests revealed significant differences between all groups. Therefore, the combined group of non-monolingual Japanese speakers encoded Goal adverbially significantly more than monolingual speakers of Japanese, who in turn encoded Goal adverbially significantly more than monolingual speakers of English.

Finally, figure 4.7 shows an error bar plot illustrating mean number of verbs and adverbials encoding Goal per clause in all clauses containing Path across the three main L1 groups.

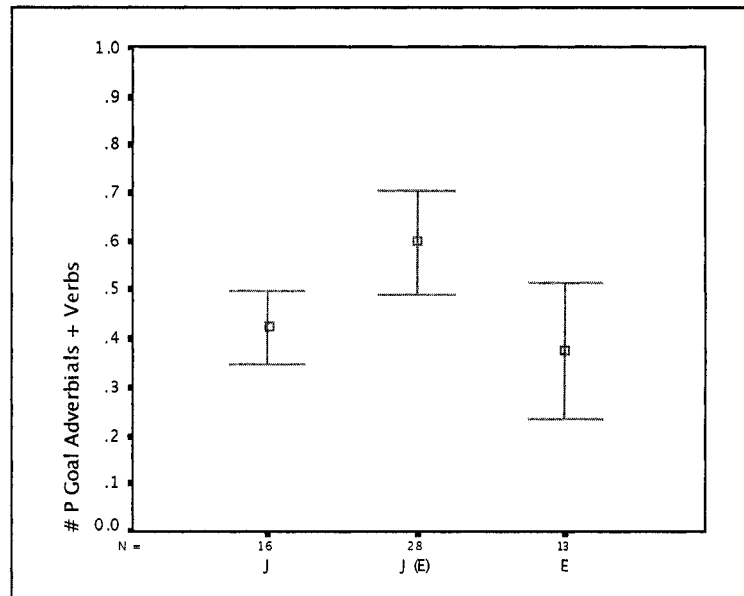


Figure 4.7: Mean number of Goal verbs and adverbials per clause in all clauses containing Path across three L1 groups: J, J (E), and E

A final Kruskal-Wallis test again showed a significant difference in the mean number of verbs and adverbials encoding Goal per clause between groups:  $\chi^2(2, N=57) = 8.197, p = .017$ . Again follow-up tests revealed that the combined group of non-monolingual Japanese speakers encoded Goal significantly more often in a combination of verbs and adverbials than both groups of monolingual speakers, who this time did not differ from each other.

To conclude, contrary to predictions for the monolingual baseline, Japanese speakers in general packaged more Path expressions per verb clause than monolingual

English speakers. However, clauses produced by native Japanese speakers with knowledge of English contained the highest number of Path expressions. This appeared to be due to significantly higher use of adverbials, in particular postpositions as well as a combination of verbs and adverbials encoding Goal of motion, compared to Japanese monolinguals.

#### 4.5.1.3 Encoding of Path in L1 narrative

In the final analysis of expression of Path in L1 speech, we investigated how often Path was explicitly mentioned in motion event narratives. Table 4.6 shows a two-tiered analysis of the mean proportion of target motion clauses and full target motion descriptions (i.e. all clauses produced to describe a target motion event) containing Path information across L1 groups.

Table 4.6: *Mean proportion (SD) of clauses and descriptions containing Path information across L1 groups*

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
P clauses	.97 (.09)	.94 (.08)	.92 (.08)	.95 (.08)
P descriptions	.98 (.06)	.98 (.06)	.96 (.09)	.98 (.07)

As predicted, results for inclusion of Path in narrative were almost at ceiling levels for all groups. A Mann-Whitney  $U$  test revealed no significant differences between the two sub-groups of non-monolinguals: for mean proportion of clauses with Path ( $z = -.444$ ,  $p = .657$ ) or for mean proportion of descriptions with Path ( $z = -.730$ ,  $p = .465$ ). Furthermore, two Kruskal-Wallis tests revealed no significant differences

between monolingual groups and the combined group of non-monolingual Japanese speakers with intermediate L2 English for Path expression in clause ( $\chi^2(2, N=57) = 4.408, p = .110$ ) or for Path expression in description ( $\chi^2(2, N=57) = .273, p = .872$ ). Therefore, all L1 groups encoded Path to the same degree at the level of the clause and at the level of event description.

We have seen that monolingual English and monolingual Japanese speakers lexicalize Path in different ways, and that this leads to a certain amount of concatenation of Path expression in monolingual English discourse, but surprisingly more in monolingual Japanese discourse. Moreover, while the lexicalization patterns of native Japanese speakers with knowledge of English appear qualitatively comparable to their monolingual counterparts, the morphosyntactic distribution of Path information varies quantitatively, such that non-monolingual Japanese speakers pack more Path adverbials into clauses than monolingual Japanese speakers. Moreover, native Japanese speakers with knowledge of English appeared to mark Goal of motion more explicitly in discourse than both groups of monolinguals. Given the relationship proposed particularly between complexity of Path expression within the clause and number of associated gestures depicting Path, the somewhat results described above are predicted to have an impact on Path gestures. We turn to this analysis next.

#### **4.5.2 Expression of Path in L1 gesture**

Analyses of co-speech iconic gestures in this study focus first on alignment and second on concatenation of Path gestures produced. The number of participants

included in analyses of gesture is smaller than that included in analyses of speech. While almost all participants mentioned Path in speech, not all participants gestured and only a subset of participants gestured about Path. The gesture production of these participants is reflected in the results below.<sup>7</sup>

#### **4.5.2.1 Alignment of Path gestures in L1 narrative**

For the analysis of gesture-speech alignment, two coding categories were considered: Path gestures aligned with speech that included a motion verb and Path gestures aligned with speech that included a Path adverbial. These categories were selected as they reflected the major point of departure for crosslinguistic differences in previous studies (cf. Stam, 2006a; 2006b). It was predicted that monolingual Japanese speakers would primarily align Path gestures with verbs, while monolingual English speakers were predicted to align Path gesture with both verbs and adverbials. However, since we saw that monolingual Japanese speakers actually employed a rather high number of adverbials to encode Path in speech, this question was a little more open than originally expected.

Table 4.7 illustrates the proportion of Path gestures out of all Path gestures aligned with speech that included a motion verb, as well the proportion of Path gestures aligned with speech including a Path adverbial, i.e. adposition or particle, across L1 groups.

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<sup>7</sup> In order for participants to be included in the gesture analyses, they had to contribute at least one gesture in a description of any of the four events.

Table 4.7: Mean proportion (SD) Path gestures out of all Path gestures aligned with speech containing a motion verb or Path adverbial across L1 groups

	Mono Japanese (J) n=13	L1 Non-mono Japanese Japan (J (E:Japan)) n=10	L1 Non-mono Japanese USA (J (E:USA)) n=11	Mono English (E) n=10
P gesture with motion verb	.53 (.39)	.65 (.26)	.49 (.25)	.42 (.28)
P gesture with Path adverbial	.21 (.24)	.16 (.20)	.26 (.20)	.58 (.32)

A Mann-Whitney  $U$  test indicated no significant differences between the two sub-groups of non-monolinguals, i.e. those resident in Japan versus the USA, for Path gestures with motion verbs ( $z = -1.488$ ,  $p = .137$ ) or for Path gestures with Path adverbials ( $z = -1.259$ ,  $p = .208$ ). Therefore, these two sub-groups were collapsed for the subsequent analyses to form one group of non-monolingual Japanese speakers performing in their L1 (J (E)).

Two separate analyses were conducted to evaluate differences in Path gesture positioning. Figure 4.8 shows an error bar plot illustrating mean proportion of Path gestures aligned with speech containing motion verbs across the three main L1 groups.



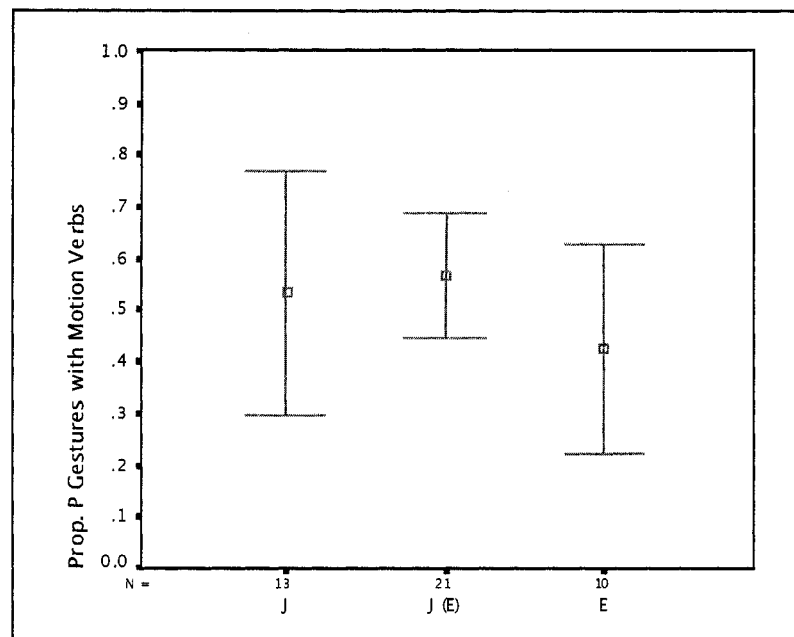


Figure 4.8: Mean proportion of Path gestures out of all Path gestures aligned with speech containing a motion verb across three L1 groups: J, J (E), and E

A Kruskal-Wallis test revealed no significant differences in the mean proportion of Path gestures aligned with speech containing a motion verb between monolingual groups and the combined group of non-monolingual Japanese speakers:  $\chi^2(2, N=44) = 1.674$ ,  $p = .433$ . Therefore, all groups aligned comparable proportions of Path gestures with motion verbs. Although both monolingual groups exhibited substantial variability, the distributions were not bi-modal.

A second analysis, illustrated in Figure 4.9, evaluated mean proportion of Path gestures aligned with speech containing Path adverbials across the three main L1 groups.

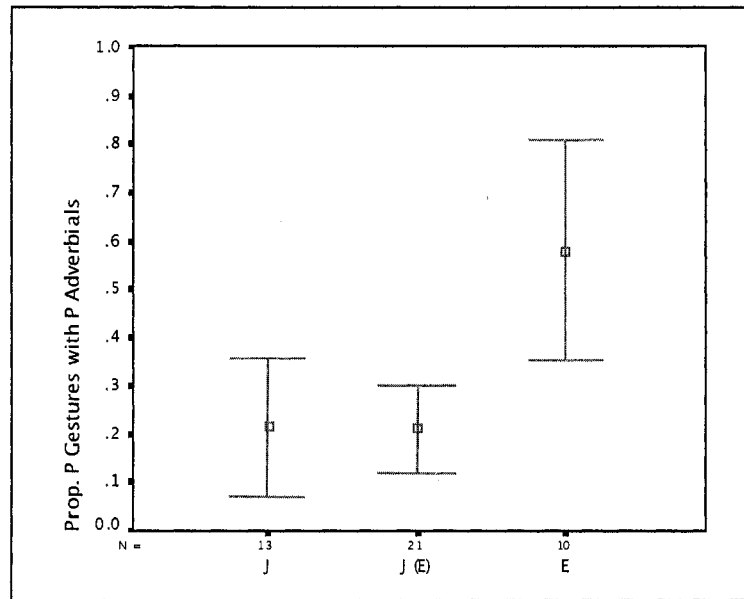


Figure 4.9: Mean proportion of Path gestures aligned with speech containing a Path adverbial across three L1 groups: J, J (E), and E

A Kruskal-Wallis test revealed a significant difference in mean proportion of Path gestures aligned with speech containing a Path adverbial between groups:  $\chi^2(2, N=44) = 9.950, p = .007$ . Follow-up tests showed that monolingual English speakers aligned a significantly higher proportion of Path gestures with speech containing Path adverbials than either of the Japanese-speaking groups, although again there was substantial variability with the monolingual English group, which this time appeared to be distributed bi-modally. No difference was found between monolingual and the combined group of non-monolingual Japanese speakers.

#### 4.5.2.2 Concatenation of Path gestures in L1 narrative

For the analysis of concatenation of Path gestures in L1 narratives, the number of Path gestures per verb clause was calculated. It was predicted that monolingual

English speakers would exhibit greater concatenation of gestures depicting Path corresponding to greater concatenation of expressions in speech depicting Path (cf. Stam 2006a; 2006b). However, given that monolingual Japanese speakers actually packed a significantly higher number of Path expressions per clause than monolingual English speakers, this made previous predictions for concatenation of Path gesture less likely. Table 4.8 illustrates the mean number of Path gestures per clause across L1 groups.

Table 4.8: *Mean number (SD) Path gestures per clause across L1 groups*

	Mono Japanese (J) n=13	L1 Non-mono Japanese Japan (J (E:Japan)) n=10	L1 Non-mono Japanese USA (J (E:USA)) n=11	Mono English (E) n=10
# P gesture	1.27 (.43)	1.15 (.23)	1.38 (.31)	1.63 (.64)

A Mann-Whitney U test showed marginally significant differences between the two sub-groups of non-monolinguals:  $z = -1.921$ ,  $p = .055$ . Therefore, these two sub-groups were not collapsed for the subsequent analysis. Figure 4.10 shows an error bar plot illustrating mean number of Path gestures per clause across all L1 groups.

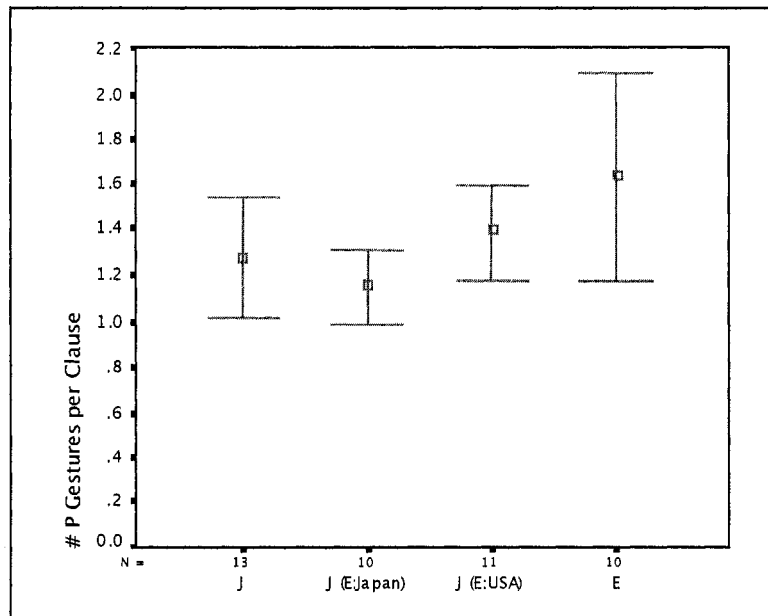


Figure 4.10: Mean number of Path gestures per clause across four L1 groups: J (monolingual Japanese speakers), J (E:Japan: native Japanese speakers with intermediate L2 English resident in Japan), J (E:USA: native Japanese speakers with intermediate L2 English resident in the USA), and E (monolingual English speakers)

A Kruskal-Wallis test showed no significant difference in mean number of Path gestures per clause between all L1 groups:  $\chi^2(2, N=44) = 6.422, p = .093$ . Statistically speaking, all groups produced comparable numbers of Path gestures per clause. However, the previous analysis revealed a marginally significant difference between non-monolingual sub-groups, such that those resident in the USA stacked more Path gestures per clause than those in Japan. An additional trend is observable from the graph for monolingual English speakers to produce a slightly greater number of Path gestures per clause than other groups. Although again there was the variability within the monolingual English-speaking group, it was not distributed bi-modally. Therefore, while the trend for concatenation of Path expressions in monolingual English speech

did not appear to follow that in previous research, the trend for concatenation of Path gesture in English discourse was in line with previous research.

In sum, as expected, monolingual Japanese speakers aligned Path gestures frequently with motion verbs and not with Path adverbials, whereas monolingual English speakers aligned Path gestures with both elements. However, rather unexpectedly, monolingual English speakers appeared to exhibit slightly greater concatenation of Path gesture in the verb clause, but not Path speech. In contrast, monolingual Japanese speakers, who exhibited concatenation of Path expression in speech, did not do so to such a great extent in gesture. Moreover, while native Japanese speakers with knowledge of English patterned very differently from their monolingual Japanese counterparts in Path speech, they did not pattern differently in Path gesture. These results will be discussed in section 4.6. We turn now to production patterns in the L2.

#### **4.5.3 Expression of Path in L2 speech**

All above analyses of Path expression in speech were repeated in the L2 of the same native Japanese speakers with intermediate knowledge of English. Results for L2 production are shown below with the “target” monolingual English results and “source” monolingual Japanese results repeated for ease of comparison.

##### **4.5.3.1 Lexicalization of Path in L2 narrative**

English offers the possibility for use of both verbs and adverbials for expression of Path. As we have seen, monolingual English speakers typically prefer adverbials.

Moreover, none of the three verb types used by monolingual English speakers included Latin borrowings such as *descend* or *ascend*, but were instead light Path verbs such as *go*. Therefore, use of Path verbs other than these light verbs in L2 discourse would be highly marked and suggestive of transfer from the L1. However, use of such verbs is also somewhat unlikely given their formal register. Instead, we might expect L2 speakers to use a combination of light Path verbs and adverbial Path expressions such as particles or prepositions, as these are very common in discourse and some of the very early lexical items introduced in beginning English textbooks. Table 4.9 illustrates the use of each of the lexical categories of verb and adverbial by listing lexical types employed by each group, repeating the lexical categories employed by monolingual speakers for convenience.

Table 4.9: *Lexical types used to express Path across all events in monolingual and L2 groups*

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=13
P verb types	<i>agaru</i> 'rise' <i>hairu</i> 'enter' <i>iku</i> 'go' <i>komu</i> (only in compound form) 'into' <i>kudaru</i> 'descend' <i>kuru</i> 'come' <i>nerau</i> 'aim' <i>noboru</i> 'climb' <i>noru</i> (only in compound form) 'onto' <i>ochiru</i> 'fall' <i>shinnyuu-suru</i> 'invade' <i>tai~suru</i> 'go toward'	<i>approach</i> <i>arrive</i> <i>come</i> <i>enter</i> <i>get</i> <i>go</i> <i>move</i> <i>push</i> <i>reach</i> <i>through</i> (v) <i>up</i> (v)	<i>approach</i> <i>come</i> <i>drop</i> <i>enter</i> <i>fall</i> <i>get</i> <i>go</i> <i>reach</i>	<i>come</i> <i>get</i> <i>go</i>

	<i>tooru</i> 'go along' <i>tsutau</i> 'go through' <i>tsutawaru</i> 'go through' <i>utsuru</i> 'move' <i>wataru</i> 'cross' <i>yaru</i> 'be transmitted'			
P adverbial types	<i>he</i> 'to' <i>kara</i> 'from' <i>made</i> 'until/to' <i>ni</i> 'to' <i>zu-to</i> 'all the way'	<i>along</i> <i>around</i> <i>down</i> <i>from</i> <i>in</i> <i>inside</i> <i>into</i> <i>over</i> <i>through</i> <i>to</i> <i>toward</i> <i>up</i>	<i>across</i> <i>down</i> <i>from</i> <i>in</i> <i>inside</i> <i>into</i> <i>outside</i> <i>through</i> <i>to</i> <i>up</i>	<i>across</i> <i>all the way</i> <i>along</i> <i>back</i> <i>behind</i> <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>

As predicted, learners employed light Path verbs and also a rather wide variety of common adverbial expressions to encode Path, which resembled the target pattern. However, compared to the monolingual English speakers, the learners of English employed a greater variety of Path verbs. There were several examples of non-target-like lexicalization. Learners used a number of Path verbs not found in monolingual English discourse (shown in example (14)), attempted to compound verbs in a non-target-like way (shown in examples (15) and (16)), and even tellingly transformed adverbials into verbs (shown in example (17)), as the following descriptions of Bowling Climb with relevant parts underlined illustrate.

- (14) *but ah move move into the drainpipe*
- (15) *that the black cat is coming up in the pipe*
- (16) *and uh and the cat goes enter the bowling center*
- (17) *and he throughed inside the drainpipe.*

In sum, while learners did exhibit a range of adverbial lexical types to express Path roughly comparable to that produced by monolingual English speakers, the overall pattern of Path lexicalization was rather mixed between verbs and adverbials in learner discourse. This phenomenon resembled monolingual production in the source language. Given this pattern, learners could concatenate Path expressions within the L2 clause, although findings from previous research suggest that this is unlikely.

#### 4.5.3.2 Morphosyntactic distribution of Path within the L2 clause

Although in their L2, native Japanese speakers with knowledge of English produced a range of lexical types to encode Path, they were not predicted to concatenate Path expressions within the clause to the extent of the other groups. Table 4.10 illustrates the mean number of Path expressions (all kinds) per clause in verb clauses expressing Path across monolingual and L2 groups.

Table 4.10: *Mean number (SD) of Path expressions (verbs and adverbials) per clause employed in all clauses containing Path across monolingual and L2 groups*

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J,Japan)) n=15	L2 Non-mono Japanese USA (E (J,USA)) n=13	Mono English (E) n=13
P expressions	1.85 (.25)	1.77 (.32)	1.60 (.42)	1.58 (.31)



A Mann-Whitney  $U$  test indicated no significant difference between the two sub-groups of non-monolinguals, i.e. those resident in Japan versus the USA ( $z = -1.295$ ,  $p = .195$ ). Therefore, these two sub-groups were collapsed for subsequent analyses to form one group of non-monolingual Japanese speakers performing in their L2 (E (J)).

Figure 4.11 shows an error bar plot illustrating mean number of Path expressions per clause in all clauses containing Path across monolingual and L2 groups.

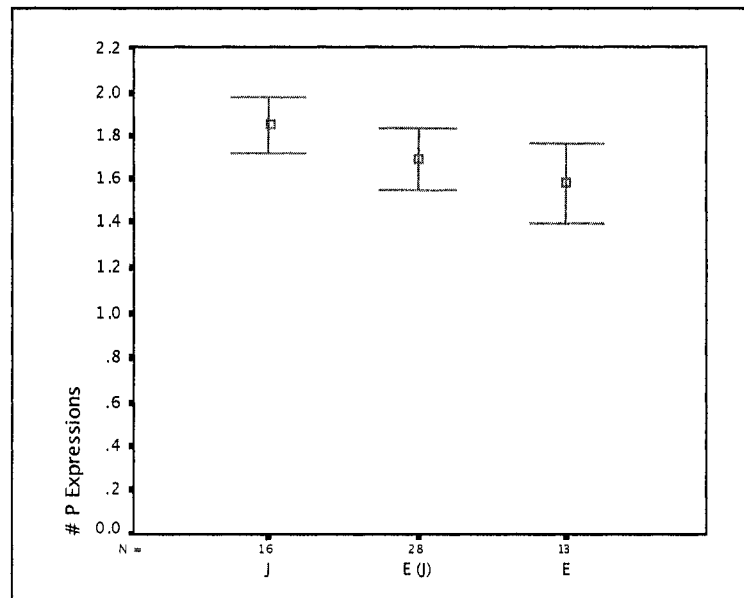


Figure 4.11: Mean number of Path expressions per clause in all clauses containing Path across monolingual and L2 groups: J (monolingual Japanese speakers), E (J) (native Japanese speakers with intermediate L2 English resident in Japan and the USA), and E (monolingual English speakers)

A Kruskal-Wallis test revealed no significant difference in the mean number of Path expressions used per clause between the combined group of native Japanese speakers with intermediate L2 English and monolingual groups:  $\chi^2(2, N=57) = 5.068$ ,  $p$

= .079. Thus, rather surprisingly L2 speakers packaged as many Path expressions per clause as monolingual speakers of English. Indeed, a trend was observed in which learners actually patterned between both groups of monolinguals, with slightly more Path expressions per clause than monolingual English speakers (i.e.  $\bar{\chi}$  1.69 versus  $\bar{\chi}$  1.58 respectively). Some examples of concatenation of Path expression in L2 production can be found below.

(18) [*and he climbed up inside through the pipe*]

(19) [*so um he decided go to to go to go climb up inside of this drainpipe*]

(20) [*and falling down to the slope to the bowling center*]

Example (18) illustrates Path lexicalized in three adverbial expressions. Example (19) shows the use of a light Path verb with two associated adverbials. And example (20) illustrates use of a Path verb and three Path adverbials. Of course, disfluencies, false starts and grammatical errors in much of the L2 production demonstrated the difficulty that learners had with descriptions of such complex motion events. Despite these difficulties, many of the concatenated Path expressions did reflect relatively target-like constructions, e.g. *went up to the room, through the drainpipe, roll down and down and down, climb up to the window, swing across to the window*.

Since L2 speakers exhibited concatenation of Path expression to a higher degree than expected, since they employed a combined strategy of verbs and adverbials, and since a wide variety of verb and adverbial lexical types were produced in the L2, subsequent post-hoc analyses of verb and adverbial use were conducted. Table 4.11

summarizes the mean number of verbs and adverbials per clause across monolingual and L2 groups.

Table 4.11: Mean number (SD) of Path verbs and Path adverbials per clause employed in all clauses containing Path across monolingual and L2 groups

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (J (J,Japan)) n=15	L2 Non-mono Japanese USA (E (J,USA)) n=13	Mono English (E) n=13
# P verbs	1.24 (.19)	.62 (.21)	.66 (.27)	.28 (.19)
# P adverbials	.61 (.18)	1.15 (.35)	.94 (.45)	1.30 (.22)

A Mann-Whitney U test indicated no significant differences between the two sub-groups of non-monolinguals for number of Path verbs ( $z = -.324$ ,  $p = .746$ ) or for number of Path adverbials ( $z = -.947$ ,  $p = .344$ ). Therefore, these two sub-groups were collapsed (E (J)).

Two subsequent analyses were conducted to evaluate differences between language groups in production of each option for Path lexicalization. Figure 4.12 shows an error bar plot illustrating mean number of Path verbs per clause in all clauses containing Path across monolingual and L2 groups.

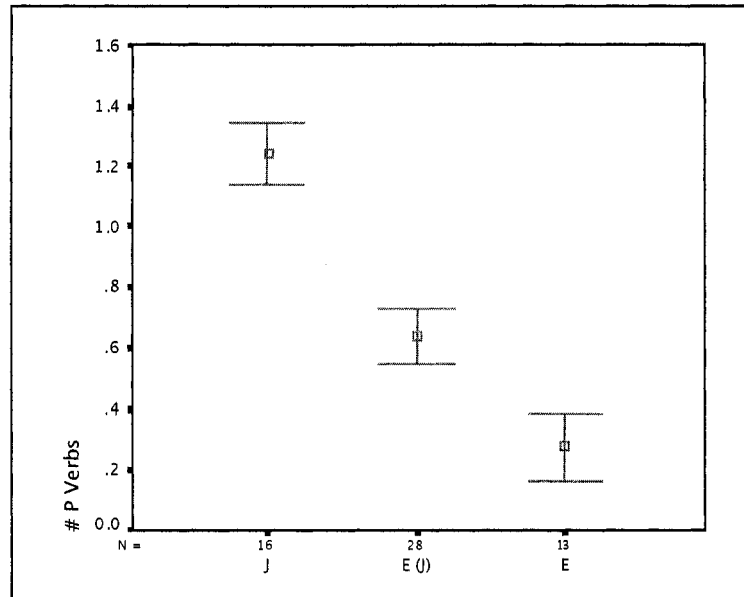


Figure 4.12: Mean number of Path verbs per clause in all clauses containing Path across monolingual and L2 groups: J, E (J) and E

A Kruskal-Wallis test showed a significant difference in the mean number of Path verbs used per clause between groups:  $\chi^2(2, N=57) = 41.160, p < .001$ . Follow-up pairwise comparisons revealed significant differences between all three groups. Thus, the combined group of Japanese learners of English produced significantly more Path verbs per clause than monolingual English speakers, although significantly fewer than monolingual Japanese speakers.

Figure 4.13 shows an error bar plot illustrating mean number of Path adverbials in all clauses containing Path across monolingual and L2 groups.

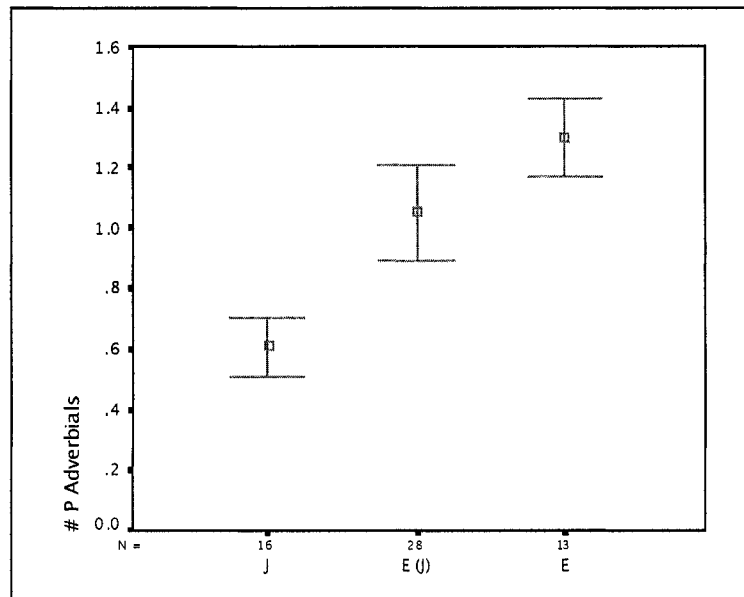


Figure 4.13: Mean number of Path adverbials in all clauses containing Path across monolingual and L2 groups: J, E (J), and E

A separate Kruskal-Wallis test showed a significant difference in the mean number of Path adverbials used per clause between groups:  $\chi^2(2, N=57) = 26.157, p < .001$ . Follow-up tests again revealed differences to be significant among all three groups. In a pattern reversing that observed for verbs, and the combined group of L2 speakers produced significantly fewer Path adverbials per clause than monolingual English speakers, but again significantly more than monolingual Japanese speakers.

Although L2 speakers appeared to pattern precisely between source and target language speakers in terms of verb and adverbial usage, final support for this conclusion depends on the exact nature of adverbial use, particularly with regard to expression of Source and Goal. As we saw previously, expression of Source and Goal is possible in both English and Japanese, but not frequent in monolingual English discourse. Hence, the final post-hoc analysis, summarized in Table 4.12, was

undertaken to compare encoding of Source and Goal in clauses across monolingual and L2 groups. These analyses focused in the first instance on adverbial usage, but as Goal of motion was additionally encoded in verbs, e.g. *reach* and *get*, verb use was also included,

Table 4.12: Mean number (SD) of Source and Goal adverbials per clause in all clauses containing Path across monolingual and L2 groups

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L2 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=13
# Source Adverbials	.17 (.21)	.05 (.09)	.07 (.10)	.03 (.07)
# Goal adverbials	.42 (.14)	.44 (.17)	.37 (.33)	.29 (.22)
# Goal verbs + adverbials	.42 (.14)	.59 (.24)	.56 (.34)	.37 (.23)

A Mann-Whitney U test revealed no significant differences between the two sub-groups of non-monolinguals for number of Source adverbials ( $z = -.501$ ,  $p = .616$ ), for number of Goal adverbials ( $z = -.719$ ,  $p = .472$ ), or for number of Goal verbs + adverbials ( $z = -.439$ ,  $p = .660$ ). Therefore, these two sub-groups were again collapsed (E (J)).

Three subsequent analyses were conducted to evaluate differences between language groups in encoding of Source and Goal. Figure 4.14 shows an error bar plot illustrating mean number of Source adverbials per clause in all clauses containing Path across monolingual and L2 groups.

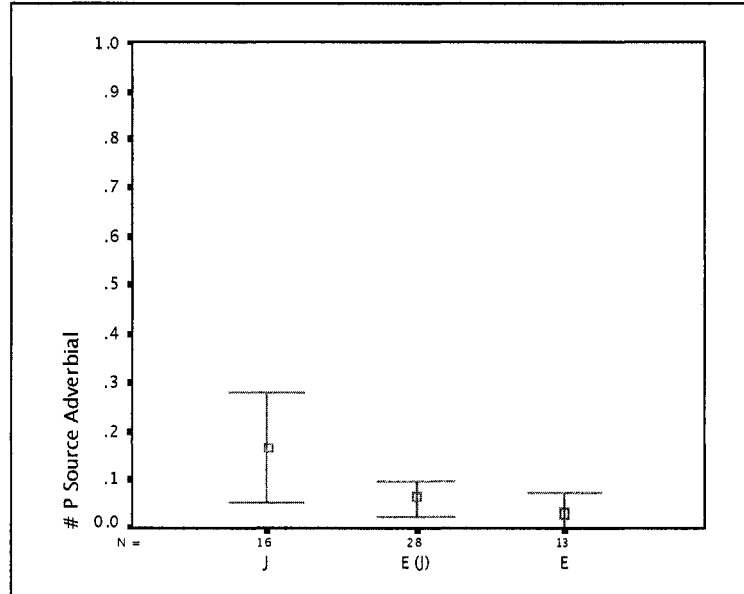


Figure 4.14: Mean number of Source adverbials per clause in all clauses containing Path across monolingual and L2 groups: J, E (J) and E

A Kruskal-Wallis test showed no significant difference in the mean number of Source adverbials used per clause between the combined group of native Japanese speakers with intermediate L2 English and monolingual groups:  $\chi^2(2, N=57) = 4.155, p = .125$ . Thus, L2 speakers exhibited statistically comparable propensity to encode Source as the target English group. However, one can see the typical shape in the graph with learner patterns falling between source and target patterns, although numbers are rather small.

Figure 4.15 shows an error bar plot illustrating mean number of Goal adverbials per clause in all clauses containing Path across monolingual and L2 groups.

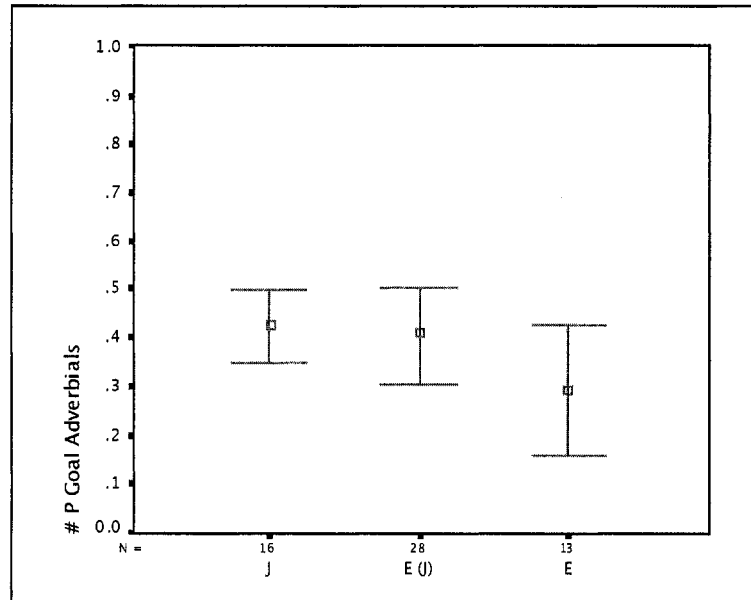


Figure 4.15: Mean number of Goal adverbials per clause in all clauses containing Path across monolingual and L2 groups: J, E (J), and E

A second Kruskal-Wallis test showed no significant difference in the mean number of Goal adverbials per clause used between the combined group of native Japanese speakers with intermediate L2 English and monolingual groups:  $\chi^2(2, N=57) = 3.804, p = .149$ . Thus, L2 speakers exhibited comparable propensity to encode Goal of motion as the target English group. However, since in previous analyses monolingual groups significantly differed in this area, one should note the trend for L2 speakers to pattern in a way more similar to monolingual speakers of the source language (i.e.  $\bar{\chi} .41$  versus  $\bar{\chi} .42$  respectively).



Figure 4.16 shows an error bar plot illustrating mean number of verbs and adverbials encoding Goal per clause in all clauses containing Path across monolingual and L2 groups.

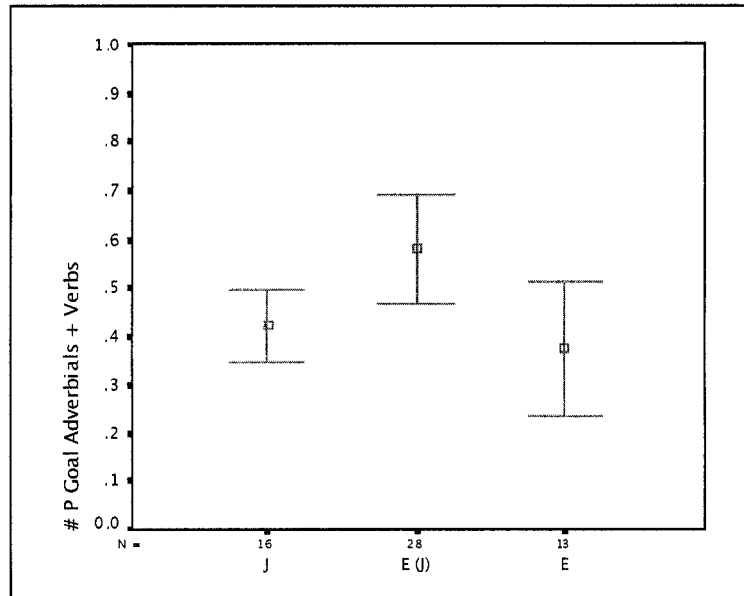


Figure 4.16: Mean number of Goal verbs and adverbials per clause in all clauses containing Path across monolingual and L2 groups: J, E (J), and E

A final Kruskal-Wallis test this time revealed significant differences in the mean number of Goal verbs and adverbials per clause between groups:  $\chi^2(2, N=57) = 6.788, p = .034$ . Follow-up tests showed that the combined group of L2 speakers encoded Goal significantly more often in a combination of verbs and adverbials than both groups of monolingual speakers, who as we saw in analyses of the L1 did not differ from each other in this particular area.

Overall, then, L2 production in terms of morphosyntactic distribution of Path information in the clause generally exhibited features of both source and target languages. Lexicalization patterns were mixed, with concatenation of Path expression

within the clause that included, among other things, frequent mention of Source and especially Goal of motion. We close the section on Path expression in L2 speech with an analysis of Path encoding.

#### 4.5.3.3 Encoding of Path in L2 narrative

In the final analysis of expression of Path in L2 speech, we investigated how often Path was explicitly mentioned in motion event narratives. Table 4.13 shows a two-tiered analysis of the mean proportion of clauses and full target motion descriptions (i.e. all clauses produced to describe a target motion event) containing Path information across monolingual and L2 groups.

Table 4.13: *Mean proportion (SD) of clauses and full target motion descriptions containing Path information across monolingual and L2 groups*

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L1 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=13
P in clauses	.97 (.09)	.92 (.10)	.80 (.19)	.95 (.08)
P in descriptions	.98 (.06)	1 (0)	.98 (.07)	.98 (.07)

As previously, results for inclusion of Path in narrative were at ceiling levels for almost all groups. A Mann-Whitney  $U$  test indicated no significant difference between the two sub-groups of non-monolinguals for mean proportion of clauses with Path, ( $z = -1.750$ ,  $p = .08$ ) and for mean proportion of descriptions with Path ( $z = -1.074$ ,  $p = .283$ ). Therefore, these groups were collapsed. However, we can see from the table that number of clauses with explicit mention of Path among L2 speakers resident in the USA was slightly lower than the other groups. This trend seemed to drive results from

the subsequent Kruskal-Wallis test which indicated a significant difference in proportion of clauses with Path information between the combined group of native Japanese speakers with intermediate L2 English and monolingual groups:  $\chi^2(2, N=57) = 7.643, p = .022$ . Pairwise comparisons revealed that learners explicitly mentioned Path less often than monolingual speakers of the source language, but did not differ from monolingual speakers of the target language. In terms of explicit encoding of Path at the discourse level, there were no significant differences between L2 and monolingual production:  $\chi^2(2, N=57) = .340, p = .844$ . Overall, however, we can conclude that L2 speakers patterned in a target-like way with respect to explicit mention of Path information at the clause and discourse levels. We turn to the analysis of gestures next.

#### **4.5.4 Expression of Path in L2 gesture**

Analyses of alignment and concatenation of Path gestures were repeated in the L2. While only a subset of monolingual participants gestured, all L2 participants gestured; hence, the full L2 dataset is included here.

##### **4.5.4.1 Alignment of Path gestures in L2 narrative**

As previously, two coding categories were considered: Path gestures aligned with speech that included a motion verb and Path gestures aligned with speech that included a Path adverbial. Given that L2 speakers employed a variety of lexicalization options to encode Path, it was predicted that they would vary in positioning of Path

gesture also. Table 4.14 illustrates the proportion of Path gestures out of all Path gestures aligned with speech that included a motion verb, as well the proportion of Path gestures out of all Path gestures aligned with speech including a Path adverbial, i.e. adposition or particle, across monolingual and L2 groups.

Table 4.14: *Mean proportion (SD) Path gestures out of all Path gestures aligned with speech containing a motion verb or Path adverbial across monolingual and L2 groups*

	Mono Japanese (J) n=13	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=10
P gesture with motion verb	.53 (.39)	.31 (.28)	.44 (.23)	.42 (.28)
P gesture with Path adverbial	.21 (.24)	.51 (.24)	.35 (.33)	.58 (.32)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of non-monolinguals, i.e. those resident in Japan versus the USA, for Path gestures with motion verbs ( $z = -1.411$ ,  $p = .158$ ) or for Path gestures with Path adverbials ( $z = -1.455$ ,  $p = .146$ ). Therefore, these two sub-groups were collapsed for the subsequent analyses to form one group of non-monolingual Japanese speakers performing in their L2 (E (J)).

Two separate analyses were conducted to evaluate differences in Path gesture alignment. Figure 4.17 shows an error bar plot illustrating mean proportion of Path gestures aligned with speech containing motion verbs across monolingual and L2 groups.

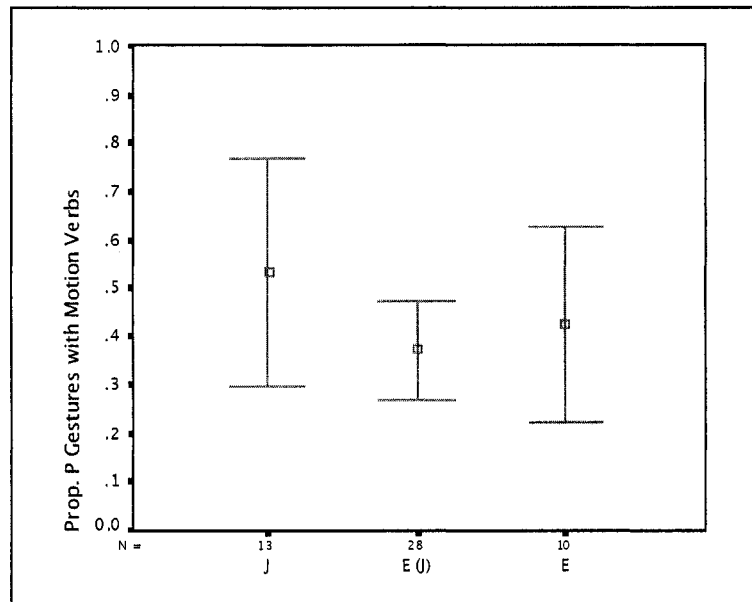


Figure 4.17: Mean proportion of Path gestures out of all Path gestures aligned with speech containing a motion verb across monolingual and L2 groups: J, E (J), and E

A Kruskal-Wallis test showed no significant difference in mean proportion of Path gestures aligned with speech containing a motion verb between the combined group of native Japanese speakers with intermediate L2 English and monolingual groups:  $\chi^2(2, N=51) = 1.977, p = .372$ . Therefore, all groups aligned comparable proportions of Path gestures with motion verbs.

A second analysis, illustrated in Figure 4.18, evaluated mean proportion of Path gestures aligned with speech containing a Path adverbial across monolingual and L2 groups.

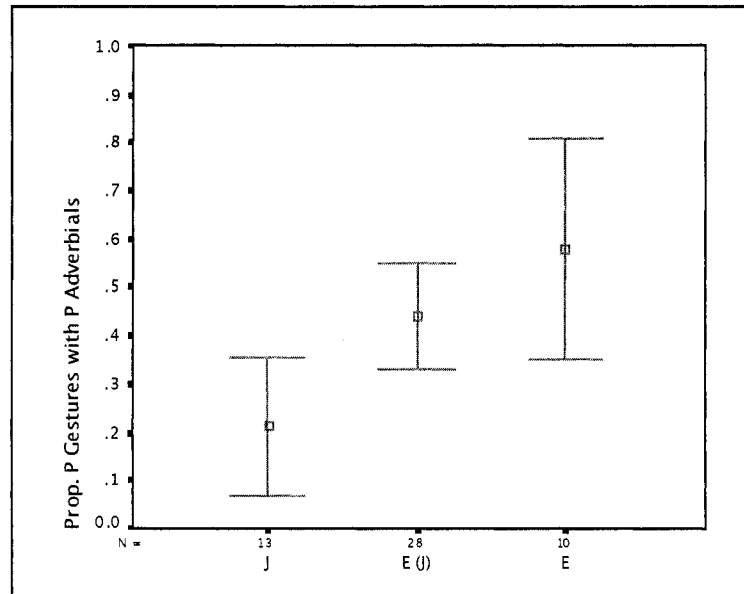


Figure 4.18: Mean proportion of Path gestures out of all Path gestures aligned with speech containing a Path adverbial across monolingual and L2: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of Path gestures aligned with speech containing a Path adverbial between groups:  $\chi^2(2, N=51) = 7.056, p = .029$ . In addition to the monolingual baseline difference found in this area, follow-up tests revealed that the combined group of L2 speakers patterned like monolingual speakers of the target language, and aligned a significantly greater proportion of Path gestures with Path adverbials than monolingual Japanese speakers. Therefore, while use of adverbials in speech did not look entirely target-like, L2 speakers exhibited evidence of learning in alignment of gestures with adverbials.

#### 4.5.4.2 Concatenation of Path gestures in L2 narrative

Subsequently, the number of Path gestures per verb clause was calculated for L2 production. Given that L2 speakers concatenated Path expressions in speech to

some extent, it was predicted that they would also exhibit some concatenation of Path gesture. Table 4.15 illustrates the mean number of Path gestures per clause across monolingual and L2 groups.

Table 4.15: Mean number (SD) Path gestures per clause across monolingual and L2 groups

	Mono Japanese (J) n=13	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=10
# P gesture	1.27 (.43)	1.80 (.63)	1.70 (.42)	1.63 (.64)

A Mann-Whitney  $U$  test showed no significant difference in mean number of Path gestures per clause between the two sub-groups of non-monolinguals: ( $z = -.440$ ,  $p = .660$ ). Therefore, the two sub-groups were collapsed.

Figure 4.19 shows an error bar plot illustrating mean number of Path gestures per clause across all monolingual and L2 groups.

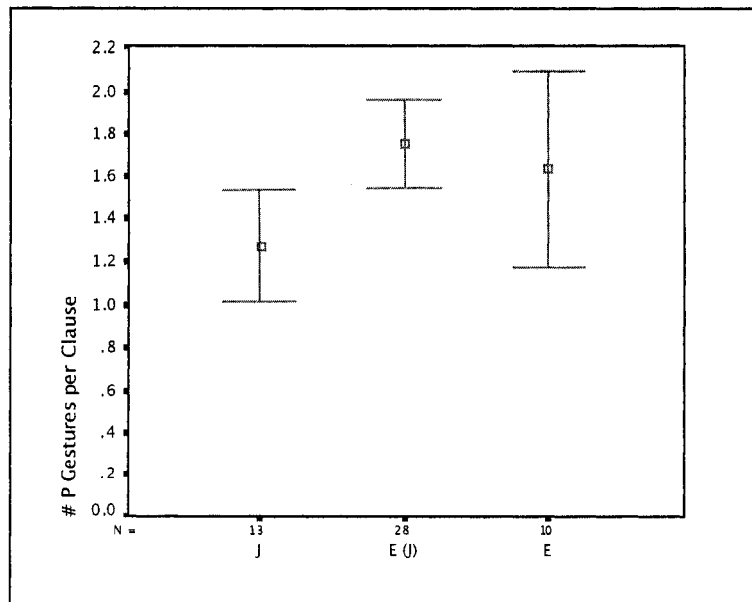


Figure 4.19: Mean number of Path gestures per clause across monolingual and L2 groups: J, E (J) and E

A Kruskal-Wallis test showed a significant difference in mean number of Path gestures per clause between groups:  $\chi^2(2, N=51) = 8.515, p = .014$ . Follow-up analyses revealed that the combined group of L2 speakers did not differ from monolingual speakers of the target language, but that they produced a significantly greater number of Path gestures per clause than monolingual Japanese speakers.

In sum, L2 speakers did not differ from monolingual speakers of English or Japanese in alignment of Path gestures with motion verbs. However, regarding alignment of Path gesture with Path adverbials, the L2 speakers patterned more like speakers of the target language, English, than speakers of the source language, Japanese. Similarly, in concatenation of Path in speech and gesture, L2 speakers again looked more target-like than source-like, but as we saw previously, the relationship between speech and gesture even in the monolingual baseline did not follow predictions.

#### **4.5.5 Within-subject comparison of expression of Path in L1 and L2 speech and gesture**

The final set of analyses in this chapter concerns the relationship between L1 and L2 production in speech and gesture of the native Japanese speakers with intermediate knowledge of English. These repeated-measures analyses were conducted using Wilcoxon tests, the results of which are summarized in Table 4.16 below with group means from the preceding analyses repeated for convenience. Since generally the group of non-monolinguals in Japan did not differ from that in the USA in either their



L1 or their L2, with the exception of number of Path gestures per L1 clause, they have been combined into one non-monolingual group with a common L1 and L2 score.

Table 4.16: *Summary of within-subject L1 and L2 production in all speech and gesture analyses*

Analysis	Non-mono L1	Non-mono L2	Result
Lexicalization of P	Mainly verbs	Both verbs and adverbials	Qualitative and quantitative difference
Mean # P expressions within clause	2.03 (.28)	1.69 (.37)	Significant difference: $z = -3.798, p < .001$
Mean # P verbs per clause	1.24 (.16)	.64 (.24)	Significant difference: $z = -4.623, p < .001$
Mean # P adverbials per clause	.79 (.30)	1.05 (.40)	Significant difference: $z = -2.727, p = .006$
Mean # adverbials encoding Source p. clause	.20 (.18)	.06 (.09)	Significant difference: $z = -3.743, p < .001$
Mean # adverbials encoding Goal p. clause	.56 (.25)	.41 (.25)	Significant difference: $z = -2.274, p = .023$
Mean # verbs + adverbials encoding Goal p. clause	.60 (.28)	.58 (.29)	Non-significant difference: $z = -.394, p = .694$
Encoding of P in clause	.93 (.08)	.86 (.16)	Non-significant difference: $z = -1.708, p = .088$
Encoding of P in event description	.97 (.08)	.99 (.05)	Non-significant difference: $z = -1.000, p = .317$
Mean prop. P gesture aligned with motion verb	.57 (.26)	.37 (.26)	Significant difference: $z = -2.871, p = .004$
Mean prop. P gesture aligned with P adverbial	.21 (.20)	.44 (.29)	Significant difference: $z = -2.114, p = .035$
Mean # of P gesture per clause	J (E:Japan) 1.15 (.23)	E (J,Japan) 1.80 (.63)	Significant difference: $z = -2.521, p = .012$
	J (E:USA) 1.38 (.31)	E (J,USA) 1.70 (.42)	Significant difference: $z = -2.524, p = .012$

The results summarized above are rather predictable given that these individuals were speaking completely different languages, L1 Japanese and L2 English. Thus, when performing in their L1, Japanese speakers with knowledge of English lexicalized Path in ways similar to monolingual speakers of Japanese, and when performing in

their L2, they partially switched to the patterns more characteristic of monolingual English speakers, but with greater lexical variety. However, given that both languages essentially allow both options for lexicalization, i.e. verb and adverbial, it is noteworthy, at least for L2 production, that patterns did not appear to be completely determined by preferences in one language or the other.

The differing patterns for lexicalization have implications for other linguistic phenomena. Depending on the language of production, speakers exhibited differing numbers of Path verbs and Path adverbials in each clause. Moreover, when using adverbials in L1 Japanese, speakers focused more on encoding of Source and in particular Goal of motion, i.e. *kara* 'from' *made* 'to', whereas in L2 English, speakers focused rather less on these components, also encoding information about the intermediate trajectory, i.e. *up* or *along*. In parallel, Path gestures produced in the L1 were primarily aligned with verbs and not adverbials, whereas in the L2, they were aligned with both. However, none of these features actually affected encoding, which was close to ceiling.

One difference of interest is the asymmetry observed in degree of concatenation of Path in speech versus that in gesture, where speakers demonstrated reverse patterns in their L1 and L2. While in the L1, speakers concatenated Path expressions to a high degree within the clause, in the L2 they did so less. In contrast, in the L2, speakers concatenated Path gesture within the clause, while in the L1 they did not. Yet these findings are fully in line with findings that show an increase of gesturing in an L2 in general (Gullberg, 1998). One of the reasons might be that the speed with which L2

production proceeds, particularly at this level, creates a longer stretch of discourse, which might then be punctuated with more gestures, as the example in (21) illustrates.

(21) [*rolling around over<sup>1st</sup> the road<sup>2nd</sup> through<sup>3rd</sup> the bowling place toward<sup>4th</sup> towards<sup>5th</sup> towards toward the bowling place]*

<sup>1st</sup> Manner gesture: hand rotating in a circle, aligned with Manner verb, Path particle, and Path adverbial – not included in analyses

<sup>2nd</sup> Path gesture: hand moving in a straight trajectory, aligned with Ground noun

<sup>3rd</sup> Path gesture: hand moving in a straight trajectory, aligned with Path adverbial

<sup>4th</sup> Path gesture: hand moving in a straight trajectory, aligned with Path adverbial

<sup>5th</sup> Path gesture: hand moving in a straight trajectory, aligned with Path adverbial

On the other hand, the asymmetry in the degree of concatenation of Path expression in speech versus in gesture seen in L1-L2 production reflects a general asymmetry observed in the monolingual baseline, such that non-monolingual Japanese speakers in the L1 resembled monolingual Japanese speakers, while non-monolingual Japanese speakers in the L2 resembled monolingual English speakers. The baseline difference here is not likely to be explained by general disfluency. Alternative explanations will be discussed in the subsequent section.

Despite the differences outlined above, there were cases where L1-L2 production exhibited similarities. The example in (22) shows production from the same individual in both Japanese and English.

- (23) L1 *[sono himo-wo tsukatte biru-no mado-kara*  
 that rope-Acc use.Con building-Gen window-from  
*tonari-no biru-he pyoon-to tobi-utsurouto]*  
 next-Gen building-to boingMim-with fly- try.to.move  
 Lit: ‘using that rope he tried to move flying BOING from the window of  
 the building to the next building’
- L2 *[next he tried to using rope from the building to building next door*  
*building] [he moved the rope] [he tried to go to next door building]*

Close inspection of these utterances reveals that they are remarkably similar with respect to lexicalization of Path and morphosyntactic distribution of Path information in the verb clause. However, the most striking similarity above concerns explicit mention of Goal in a combination of verb and adverbial. Here, native Japanese speakers explicitly talked about Goal as often in their L1 as in their L2. Recalling results of comparisons to the monolingual baseline, regardless of which language they were speaking, non-monolinguals encoded Goal significantly more often than either group of monolinguals. Therefore, while in production in L1 and L2 differed in many areas, there were some striking similarities, and even variation should be interpreted in light of other perhaps wider differences in the crosslinguistic monolingual baseline. A summary of main findings as well as a discussion of the full picture follows next.

#### 4.5.6 Summary of main findings in expression of Path

Table 4.17 summarizes all main findings from this chapter.

Table 4.17: *Summary of main findings in expression of Path*

Analyses	Findings
Lexicalization of P	Fully in line with predictions, monolingual speakers of English primarily lexicalized Path in adverbials, monolingual speakers of Japanese primarily lexicalized Path in verbs, and non-monolingual Japanese speakers lexicalized Path in both verbs and adverbials in both their L1 and their L2.
Concatenation of P expression within clause	Contrary to predictions, monolingual Japanese speakers concatenated more Path expressions within the clause than monolingual English speakers. Also contrary to predictions, L2 speakers did not differ from either monolingual group in number of expressions, although they marked Goal more often. But most surprisingly, non-monolingual Japanese speakers in their L1 concatenated the highest number of Path expressions overall, with greater marking of Goal than monolingual groups.
Encoding of P in speech	Fully in line with predictions, all groups encoded Path at ceiling levels in discourse and to a large extent in clauses. L2 speakers in the USA exhibited slightly less frequent encoding Path in clauses, but did not significantly differ from the monolingual English target.
Alignment of P gesture to speech	As predicted, monolingual speakers of Japanese aligned Path gestures with verbs and monolingual speakers of English aligned Path gestures with adverbs. Contrary to predictions, in their L1, non-monolingual speakers of Japanese patterned like monolingual Japanese speakers, and in their L2, they patterned like monolingual English speakers.
Concatenation of P gesture	Contrary to predictions, there was no relationship between concatenation of Path in speech and gesture. Monolingual speakers of English did not concatenate Path in speech to any great degree, but did so in gesture, more than monolingual speakers of Japanese. As above, in their L1, non-monolingual speakers of Japanese patterned like monolingual Japanese speakers and in their L2, they patterned like monolingual English speakers.

## **4.6 Discussion**

This study investigated spoken and gestured expression of Path in monolingual and non-monolingual discourse. Questions addressed were (1) how speakers lexicalized Path, (2) to what extent spoken expressions of Path were concatenated within the clause, (3) to what extent speakers encoded Path in speech, (4) what morphosyntactic devices Path gestures were aligned with, and (5) to what extent gestured expressions of Path were concatenated within the clause. Prior to interpreting the non-monolingual results, the picture from monolingual speakers must be sufficiently clear. These will therefore be discussed first.

### **4.6.1 Monolingual expression of Path**

A monolingual baseline difference was found in virtually all areas with the exception of explicit encoding of Path. Compared to monolingual Japanese speakers, monolingual English speakers lexicalized Path in a wider range of adverbials and aligned Path gestures more frequently with Path adverbials. Monolingual Japanese speakers, on the other hand, lexicalized Path in a wider range of verbs, which correspondingly attracted a high number of Path gestures. However, since Path is the core schema of a motion event, carrying the Figure from its Source to its Goal, both groups exhibited ceiling levels of explicit Path mention at the clause and discourse levels. These findings corroborated those of previous studies.

However, an unexpected point of departure in the monolingual baseline concerned the degree of concatenation in Path speech and gesture, findings that

contrasted with previous research. In terms of speech, Slobin and colleagues have shown that English speakers accumulate Path expressions, particularly through mention of Grounds introduced by prepositions. In contrast, speakers of verb-framed languages such as Spanish have been shown not to accumulate Path expressions within the clause, since each instance of Path mention typically requires a separate verb. The current dataset revealed that although monolingual English speakers did concatenate Path expression to some degree (mean 1.58 Path expressions per clause), monolingual Japanese speakers packed significantly more Path expressions per clause (mean 1.85 Path expressions per clause).

There were several differences between this and previous studies, which might have contributed to different findings. One obvious difference is in discourse type. Many previous observations were made on the basis of literary texts (e.g. Slobin, 1996b; 2004). Literary writers presumably have the desire to communicate their thoughts expressively, eloquently and efficiently, but they also have the time necessary to achieve this goal. In a task requiring spontaneous, spoken descriptions, speakers are generally not able to be as fully expressive in as efficient a way. Secondly, even other work using a similar type of data conducted analyses in a different way. Following Slobin, Stam (2006a) counted number of clauses with more than one Path expression, whereas the current study counted number of Path expressions per clause. Differences could also have arisen simply from the variety of motion events described. Furthermore, in Stam, descriptions of only two events, Bowling Climb and Bowling Roll, were analyzed. It is important to note that while certain rhetorical patterns may be

evidenced in spontaneous, spoken descriptions of some motion events, these 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 sufficiently complex journey in order to elicit maximal concatenation of Path expression in English speech. Finally, there may have been differences in the biographical profiles of English-speaking participants. The data in both Slobin and Stam came from “native” speakers of English, who may or may not have had varying degrees of proficiency in another language. On the other hand, the participants employed in the current study were considered “monolingual” in the sense that they fit Cook’s (2003) profile of being “minimally bilingual”, i.e. with minimal exposure to another language, with no current active study of another language, and with no use of another language in their everyday lives. With the objective of this dissertation being to investigate bidirectional L1-L2 influence even at intermediate levels of L2 proficiency, it would appear to be crucial to control for second language knowledge in any investigation of the “native” speaker baseline.

The above differences in methodologies notwithstanding, a final explanation for the findings presented here relates particularly to Japanese. Japanese, unlike Spanish, has many more options for stacking of Path expressions, for example, postpositions, compound verbs and complex motion predicates. Therefore, it may not actually 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 pays a lot of attention to Source and Goal of motion in a range of morphosyntactic devices, and thus behaves rather like a satellite-framed language (Ibarretxe-Antunano, 2004). On the other hand, the extensive concatenation of Path expression in Japanese may be an artifact of the coding scheme, particularly the fact that each component in compound verbs and complex motion predicates was treated as an individual expression of Path. At the very least, then, we must conclude that, in contrast to previous claims, typological classification regarding expression of Path does not necessarily impact morphosyntactic distribution 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.

The second unexpected finding concerns expression of Path in gesture. On the basis of previous research in speech in English, McNeill (1997) claimed that accumulation of Path expressions to depict complex trajectories would be reflected in a corresponding accumulation of Path gestures, each depicting a separate part of journey. Stam (2006a) provided some support for this claim in the form of non-significant trends, albeit on the basis of a rather small sample (five native English speakers versus five native Spanish speakers). However, this claim was not borne out by the data presented here. Monolingual English speakers concatenated significantly fewer Path expressions but significantly more Path gestures within the clause than monolingual Japanese speakers. Therefore, the notion that complex Paths expressed in individual stacked constructions can be depicted in an accompanying series of differentiated Path

gestures might be valid for examples documented in the literature, but it does not have predictive power. In other words, just because a complex Path is expressed in speech, it need not follow that all aspects of that journey will receive attention in gesture, and conversely that even if depiction of the journey in speech is simple, gestural representation might be more complex. At this point it is unclear what exactly does motivate those instances of Path gesture concatenation that we see especially among monolingual English speakers, but we will return to this in the general discussion in Chapter 7.

#### **4.6.2 Effects of the L2 on the L1 in expression of Path**

In an investigation of possible influence of a second language on a first, the crucial comparison is the *intra*-language one, holding other factors constant, between a monolingual L1 and a non-monolingual L1. Areas in which these systems show contrast can be taken as evidence to suggest alteration of the L1 system potentially as a result of acquisition of a second language. And in cases where a divergent L1 pattern actually begins to resemble a pattern exhibited by monolingual speakers of the L2, we may have stronger evidence to suggest influence of an L2 on an L1.

The L1 of Japanese speakers with knowledge of English differed from the monolingual L1 in several areas. This difference was initially observed in concatenation of Path expression within the verb clause. Non-monolingual speakers of Japanese packed significantly more Path expressions per verb clause than their monolingual counterparts. Several explanations for this difference were considered in

post-hoc analyses. These analyses showed that non-monolingual Japanese speakers were not exploiting means by which additional verbs could be inserted into clauses, i.e. in the form of compound verbs or complex motion predicates, but instead were recruiting significantly more adverbials for each clause than their monolingual Japanese counterparts.<sup>8</sup>

At a global level, the above pattern bears obvious resemblance to the monolingual English pattern, which also featured dominant use of adverbials for Path expression. This result contrasts with previous findings for Spanish-English bilinguals (Hohenstein, Eisenberg, & Naigles, 2006), where increased use of adverbials in the L1 Spanish was not observed as a result of exposure to English, although this was rather unexpected and authors were quick to point to methodological reasons accounting for the null result. However, the non-monolingual Japanese speakers here did differ from monolingual English speakers in two ways. First, non-monolingual Japanese speakers exhibited a significantly greater concatenation of Path expression within the clause than monolingual English speakers. Second, the adverbials used in non-monolingual Japanese discourse typically encoded information about Goal and occasionally Source of motion, whereas adverbials in monolingual English discourse generally encoded intermediate trajectories.

Overall, then, non-monolingual speakers of Japanese appeared to be using a combination of lexicalization strategies, verb and adverbial, in their expression of Path. While this pattern does suggest influence of the L2 on the L1, the nature of that

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<sup>8</sup> This explanation is not affected by the counting of the individual components of compound verbs and complex motion predicates since within Japanese this treatment was identical.

influence is rather more complicated than a simple matter of one-to-one loan translation. Lexicalization of directionals functions differently in English and Japanese. For example, the Japanese equivalent of the English adverbial *up*, depicting an intermediate trajectory, would be *ue-ni* 'to the top/upness', which essentially describes 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 would ultimately communicate slightly different semantic information. Furthermore, this combination of lexicalization strategies used by native Japanese speakers with knowledge of English appeared to exhibit a reflex in syntax, such that more information about Path was packed into each clause than that observed in monolingual discourse from either language.

In terms of similarities where no influence on the L2 was observed, monolingual and non-monolingual speakers of Japanese exhibited a comparable quantitative and qualitative range of lexical types, explicitness of encoding of Path expression, alignment of Path gesture, and concatenation of gesture within the clause. Regarding lexical types, the similarity is not surprising. Monolingual and non-monolingual Japanese speakers have essentially the same lexical inventory available to them; hence, we would expect them to make similar use of it. Differences would be more likely in the distribution of these lexical types, which is what we saw above. Second, ceiling levels of explicitness of Path encoding were predicted in all L1 production given that the concept of Path is central to the concept of a motion event. Third, even though morphosyntactic encoding of Path differed distributionally, this did

not affect alignment of Path gesture. Again, such a pattern can be explained. Alignment of gesture and speech is a complicated issue, which is perhaps not fully understood. Although many claim alignment is based on semantics, other factors such as prosody may play a role. In a monolingual Japanese utterance, the verb generally carries Path semantics but also sentence stress, the combined effect of which may attract a Path gesture. In a non-monolingual Japanese utterance, with the semantics of Path evident in the verb and accompanying adverbials, sentence stress may ultimately determine alignment of the gesture with the verb, resulting in comparable positioning between monolingual and non-monolingual Path gestures. Finally, the issue of concatenation of Path gesture has already been established as problematic in monolingual production, and non-monolingual production is no different. Therefore, a high degree of concatenation of Path expression will not necessarily result in corresponding concatenation of Path gesture, as evidenced by all production considered thus far.

#### **4.6.3 Effects of the L1 on the L2 in expression of Path**

Last, but by no means least, we consider the performance of non-monolinguals in their L2. Traditional analyses of L2 production in the framework of crosslinguistic influence are conducted in much the same way as the preceding ones, first with an intra-language comparison, assessing L2 production in light of the 'target'. Again, areas of contrast, specifically those where performance in the L2 resembles that of the L1, is typically considered evidence of influence of an L1 on an L2.

From the analyses presented here, in their L2, Japanese speakers with knowledge of English exhibited some evidence of learning, with mixed patterns in many areas. Learners displayed a wider range of verb types but a narrower range of adverbial types than monolingual speakers of English, a phenomenon characteristic of the first language. Interestingly, contrary to original predictions, learners also displayed many instances of concatenation of Path expression within the clause, slightly more so than monolingual English speakers. However, since monolingual Japanese speakers also did this and both groups conspicuously encoded more Goal information in adverbials, such a pattern might be interpreted as influence from the L1. Moreover, L2 speakers patterned squarely in the middle of both monolingual groups in terms of the number of Path verbs per clause, the number of Path adverbials per clause, and the alignment of Path gestures with Path adverbials. Regarding the number of Path gestures produced per clause, L2 speakers did not differ significantly from speakers of the target language. Yet, as we have seen, factors affecting this particular feature are somewhat mysterious; therefore, similar patterns in this area may have arisen for different reasons.

Finally, direct comparisons of L1 and L2 production by the same group of individuals showed all the differences one would expect with production in two different languages. However, there was one striking similarity, and that was explicitness of encoding of Goal either in adverbials or verbs. In this respect, non-monolinguals, both in their L1 and their L2, marked Goal significantly more than both groups of monolinguals. Therefore, although a difference in the actual distribution of morphosyntactic resources was observed, the semantics of Goal seemed to feature

prominently in non-monolingual discourse. This semantic focus did not seem to come from either language, but it is not exactly clear at this stage where such a focus did come from. Moreover, general differences between non-monolingual production in Japanese and English were crucially often less conspicuous than differences between monolingual production in Japanese and English. Patterns in Path adverbial usage illustrate this point very clearly. Therefore, focusing on the differences between production in the L1 and L2 masked some of the underlying similarities, yet it is the similarities that may give us an indication of the potential interactions between languages in the mind of a second language learner.

#### **4.7 Conclusion**

Within the broad goal of this dissertation of identifying and subsequently characterizing the interaction between language systems in the multilingual mind, this study examined expression of Path in elicited narratives from monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English. A number of robust patterns in speech suggested influence of the L1 on the L2, the traditional line of enquiry, but also influence of the L2 on the L1, a more novel finding. In certain areas, for example, use of adverbials, production in the L1 and L2 of a non-monolingual looked more similar than production in the L1s of monolingual speakers of different languages. Moreover, in other areas, for example encoding of Goal, non-monolingual speakers patterned in a completely parallel way in their L1 and L2, but this was a unique pattern that in no way resembled

monolingual speakers of either English or Japanese. In general, these findings are very much in line with research on Japanese-English bilinguals (Tatsumi, 1997), who showed influence of their dominant language, Japanese, on their non-dominant language, English, with greater sensitivity toward locative settings in describing downward motions, but more importantly, influence of the non-dominant on the dominant language in extensive use of adverbials to express Path.

We must, however, be somewhat tentative in our conclusions. It is not clear whether new distributions in non-monolingual discourse really provide evidence of crosslinguistic influence between the specific linguistic systems under investigation here or whether they are indicative of more universal developmental patterns. One of the main findings of this chapter was in use of adverbials, but findings from Giacobbe's (1992) longitudinal case study of an adult Spanish-speaking learner of French suggest evidence of a developmental phenomenon characterized by use of adverbials to express Path. However, the findings presented in this chapter do go some way towards showing that there is potential for interactions between languages in the multilingual mind. We now turn to subsequent chapters in order to make the nature of this interaction a little clearer.



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## **Chapter 5: Expression of Manner in Monolingual and Non-monolingual Speech and Gesture Portuguese**

### **5.1 Introduction**

As we saw in Chapter 4, lexicalization of Path of motion varies crosslinguistically, although in highly systematic ways. In short, languages choose either to express Path primarily in the verb or primarily outside the verb. On the whole, lexicalization of Manner of motion does not exhibit such crosslinguistic variation in Talmy's (1991; 2000) binary typology; Manner is predominately lexicalized in verbs or verb-like elements. However, there are other aspects of Manner expression that do vary across languages as a result of linguistic typology, for example, the extent to which speakers of different languages talk about Manner. Moreover, findings such as these have been interpreted as supporting hypotheses claiming links between language and at least linguistic cognition.

The existence of typological differences in expression of Manner in monolingual language production can again be exploited in order to detect crosslinguistic influences in multilingual language production. Furthermore, the nature of such influences may enable us to form hypotheses concerning crosslinguistic influences on patterns of "thinking for speaking"<sup>1</sup>, which in turn may help in further characterizing the nature of the relationship between a first and second language.

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<sup>1</sup> Slobin's (1996) "thinking for speaking" hypothesis is discussed in Chapter 4. The hypothesis claims that speakers will attend to the aspects of an event that their language has the readily available linguistic

This study, then, investigates the expression of Manner in elicited narratives from monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in L1 and L2. We investigate whether and how monolingual speakers of each language choose to encode Manner in speech; whether and how they encode information about Manner in co-speech representational gestures; and whether and how non-monolingual speakers in their L1 and L2 differ from the monolingual baseline in these areas. We begin by outlining what previous research tells us about the expression of Manner crosslinguistically and in second language acquisition, followed by what predictions might come out of these findings for both monolingual and non-monolingual language production. We then describe the methodology specific to this study, including details of speech and gesture coding. Finally, we present our results and draw conclusions concerning the impact of crosslinguistic differences in Manner expression on the interaction between language systems in the multilingual mind.

## **5.2 Background**

### **5.2.1 Lexicalization of Manner from a typological perspective**

According to Talmy's typology, it is the existence of Path that defines a motion event, "[t]he basic Motion event consists of one object (the Figure) moving or located with respect to another object (the reference object or Ground)." (Talmy, 2000:25) As Slobin (2004b) notes, this renders Manner of motion an optional component of a motion

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means to express, and that, over time, this habitual attention is predicted to lead to certain rhetorical styles.

event in any language, satellite- or verb-framed. Perhaps because of this lesser status, Slobin argues that Manner is a rather “ill-defined set of dimensions that modulate motion, including motor patterns, rate, rhythm, posture, affect, and evaluative factors” (2004b:255, note 5). Despite the rather imprecise nature of the concept, as one of the components of a motion event, Manner has received much theoretical and experimental attention.

In a typological framework, lexicalization of Manner, or the mapping of the semantic component of Manner onto morphosyntactic devices, is to a large extent determined by expression of Path (Talmy, 1991; 2000). In satellite-framed languages, e.g. English, the core component of Path will normally be lexicalized outside the main verb, leaving the main verb slot free for lexicalizing the Manner in which the motion took place. However, verb-framed languages, e.g. Japanese, typically reserve the main verb slot for lexicalization of Path, leaving Manner to be lexicalized in a subordinate verb or adverbial. These patterns are shown below for English and Japanese, with Manner underlined.

- (1) *The ball rolls down the hill*
- (2) *Booru-ga saka-wo korogatte iku*  
 ball-Nom hill-Acc roll.Con go  
 Lit: ‘The ball goes rolling on the hill’
- (3) *Mawari-nagara saka-wo oriru*  
 rotate-while hill-Acc descend  
 Lit: ‘(It) rotates while descending the hill’

The prototypical example from English in (1) illustrates Manner lexicalized in the main verb, *roll*. Examples (2) and (3) from Japanese illustrate Manner lexicalized as an adverbial<sup>2</sup> and a subordinated verb<sup>3</sup> respectively. Of course, both languages have alternative options available. English speakers might also lexicalize Manner as an adverbial or a subordinated verb as in (4) and (5) below. Likewise, Japanese has a certain number of compound verbs available, which lexicalize Manner along with Path in a single lexical item, as in (6), or Sino-Japanese compounds formed from Chinese borrowings combined with the neutral Japanese verb *suru* ‘do’ as in (7). Also very common in Japanese (Hamano, 1998), Basque (Ibarretxe-Antunano, 2004), Korean, and Thai (Weingold, 1995) is lexicalization of Manner in ideophones or mimetics (*giseigo* or *gitaigo* ‘words which imitate sound or shape,’ (Weingold, 1995:319)), which can function as adverbials as shown in (8).

(4) *The ball goes down the hill rolling*

(5) *As it rolls, the ball goes down the hill*

(6) *Sakamichi-wo koroge-ochiru*

hill-Acc          roll-fall

Lit: ‘(It) rolls falls the hill’

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<sup>2</sup> This construction type, classified by Matsumoto (1991; 1996) as a complex motion predicate, is discussed in Chapter 3. In these constructions, the first verb with the *-te* connective suffix in the multi-verb construction, which is often a Manner verb, functions as an adverbial, rendering the utterance mono-clausal.

<sup>3</sup> This construction, on the other hand, is a bi-clausal construction with dependent plus matrix clause conjoined by the subordinating particle *nagara* ‘while’.

- (7) *Booru-ga kaiten-suru*  
 ball-Nom revolve-do  
 Lit: 'The ball does revolve'
- (8) *Guruguru gorogoro-to haitte iku*  
 Mimetic Mimetic-Comp enter.Con go  
 Lit: '(It) goes entering, ROUND RUMBLE'

As in the case of expression of Path, typological predictions for lexicalization of Manner, i.e. in the main verb or an accompanying verb-like element, are seen as preferences exhibited in the language as opposed to grammatical requisites. While such preferences have been corroborated empirically for English in numerous studies (e.g. Naigles, Eisenberg, Kako, Highter, & McGraw, 1998; Slobin, 2004a, 2004b), we know less about the extent to which typological predictions for lexicalization of Manner in Japanese are indeed robust.

## 5.2.2 Consequences of lexicalization of Manner

Consequences of lexicalization of Manner can be seen in a number of areas in both speech and gesture.

### 5.2.2.1 Encoding of Manner in discourse

The first consequence of lexicalization of Manner concerns the extent to which information about Manner is articulated or encoded in a language. This contrasts with the semantic component of Path, which, as we saw from Chapter 4, is the defining

characteristic of a motion event and is therefore normally encoded by speakers of all languages. While all languages possess morphosyntactic devices to talk about Manner, whether speakers habitually make use of these devices is another question entirely. Talmy himself theorized that in verb-framed languages, independent expression of Manner in a subordinated verb or adverbial “can be stylistically awkward, so that information about Manner ... is often either established in the surrounding discourse or omitted altogether” (Talmy, 1985:69). Subsequent work by Slobin and colleagues (e.g. 1996b; 1997; 2004a; 2004b; 2006) has provided substantial support for this observation. The main empirical findings in this body of research stem from three corpora: crosslinguistic narratives based on the Frog Story (Mayer, 1969), literary novels originally published in different languages, and literary novels translated from one language to another. Other sources of data considered are newspapers and natural conversations between adults and between children and adults.

Using examples from Tolkien’s *The Hobbit*, Slobin (1997) illustrates how the Manner of *climbing*, encoded in the original English text, *climbed out of the tree*, is translated with equivalent Manner verbs into the satellite-framed languages, Dutch, German and Russian, but is absent from translations into the verb-framed languages, French, Italian, Portuguese, Spanish and Hebrew. Instead, these languages replace the Manner verb with a Path verb, an equivalent of *descend*. Conversely, when faced with the task of translating from a verb-framed language into a satellite-framed language, translators often add a Manner verb not present in the original text (Slobin, 1996b).



Numerous quantitative and qualitative analyses of a range of data support these observations.

The general picture emerging from analyses of the various data sources considered by Slobin is that encoding of Manner information in discourse is largely dependent on how “codable” it is (2004b:237). Manner is considered highly codable when it is expressed in a finite, monomorphemic, high-frequency verb. Such lexical accessibility contributes to “ease of processing”. Therefore, in a language like English, where Path is typically lexicalized outside the verb, leaving the main verb slot free for Manner expression, and many Manner verbs being both monomorphemic and high-frequency, speakers will routinely process Manner as an inherent part of motion. However, verb-framed languages, which typically reserve the main verb slot for Path, forcing Manner into an adverbial or subordinated verb, find Manner less codable and process it perhaps as a more incidental part of motion.

Parallel to the degree of codability and ease of processing is the issue of relative “weight” of Manner information, which Slobin seems to define in terms of syntax and discourse. In satellite-framed languages, use of a single main verb to express Manner is not syntactically complex and is regarded as the neutral option; thus, encoding of Manner information in discourse is generally perceived as “backgrounded” information. Hence, it is argued to be the absence of Manner information that would be considered salient in a satellite-framed language. Slobin illustrates this point with the hypothetical example of hearing that a bird *came into a room* and wondering why the bird did not *fly into the room* (Slobin, 1997:456). In contrast, as we have seen above, the structures

employed in verb-framed languages to express Manner (adverbials, subordinated verbs) are “heavy” in syntactic terms and therefore more difficult to process. Furthermore, multiple clauses containing Path information may already be recruited to convey complex trajectories. As a result, encoding of Manner is somehow marked and therefore perceived as “foregrounded” information in discourse. In order for information to warrant such foregrounding, it should be an exceptionally salient feature of an event.

The prevailing view, then, is that Manner information will be encoded, primarily lexicalized in the main verb, in discourse produced by speakers of satellite-framed languages. In contrast, Manner will probably not be lexicalized in the main verb, and may not be encoded at all, in the discourse of verb-framed language speakers. However, there are further interesting intra-typological differences which also deserve mention. In narrative data from six satellite-framed languages, Dutch, German, English, Mandarin, Thai and Russian, Slobin (2006) observes a wider than expected range in propensity to encode Manner. More specifically, only 17% of Dutch speakers employed a Manner verb in their descriptions of an owl flying out of a hole in a tree compared to use of an equivalent of the verb *fly* by 100% of Russian speakers. This reflects a broader division between Germanic versus other satellite-framed languages in encoding of the Manner of *flying*. Slobin explains the results for this particular motion event by comparing the linguistic resources for combining Deixis, Manner and Path in each of the languages. Germanic languages are restricted to a choice between a Deictic or a Manner verb combined with a Path satellite (i.e. *come out* or *fly out*). Either option is equally available and to some degree selected, but for some reason, speakers often opt for the

Deictic as opposed to the Manner perspective for this particular event. Russian speakers, on the other hand, have to choose between a Deictic or Path prefix on a Manner verb (e.g. *pri-letet* “come-fly” or *vy-letet* “out-fly”), but crucially both options require the Manner verb. Mandarin, as an equipollently-framed language (see footnote 4 below), can express all three elements (Deixis, Manner and Path) in a serial verb construction, with the result that Manner is often mentioned even to describe an event where a deictic perspective seems salient to speakers of Germanic languages.

On the basis of the above data, Slobin (2004b) argues for a typological cline rooted in “Manner salience” as opposed to the binary division proposed by Talmy, at least with respect to the encoding of Manner.<sup>4</sup> In “high-manner-salient languages”, for example Russian, Thai and Mandarin, Manner is easily codable and does not compete with other elements of a motion event; therefore, almost all speakers will lexicalize Manner in the main verb. Germanic languages are proposed to occupy some middle ground on the cline because Manner is easily codable, but competes for the main verb slot with elements such as Deixis. Therefore, Manner will appear in the main verb some of the time in these languages, perhaps dependent on the perceptual properties of the event, e.g. to what extent a deictic perspective is salient. However, in “low-manner-salient languages”, for example, Spanish, French, Turkish, Italian and Hebrew (all verb-framed languages), Manner is not easily codable at all and hence will often be omitted.

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<sup>4</sup> Slobin (2004b) argues for an additional tripartite typology based on expression of Path: satellite-framed, verb-framed and equipollently-framed languages. The latter group is proposed to account for serial-verb languages, bipartite verb languages and generic verb languages, which express Manner and Path in morphemic elements of equal status. However, since the addition of the third category does not change the classification of English and Japanese as satellite-framed and verb-framed respectively, this additional typology is not discussed here.

Striking in all the research reviewed above is the focus on the *verb*. What of Manner lexicalized in other morphosyntactic devices? Özçaliskan and Slobin (2003) investigated this very issue by asking whether speakers of a verb-framed language, Turkish, actually encode Manner using devices other than the verb to a greater extent than speakers of a satellite-framed language, English. Again oral narratives and literary novels in the original languages comprised the data. Özçaliskan and Slobin hypothesized that inferences about Manner could be made on the basis of adverbial expressions, descriptions of internal states, and descriptions of features of the physical environment. They found that elaborations such as these differed in the two languages in that they accompanied Manner verbs in English and non-Manner verbs in Turkish. However, there was no difference in the frequency with which speakers of either language employed this kind of Manner elaboration. Therefore, although Turkish used adverbial and other devices to lexicalize Manner information not lexicalized in the verb, English speakers still encoded Manner of motion in discourse at a higher rate because of the higher rate of Manner verbs.

In a similar analysis of Spanish and English, however, Naigles, Eisenberg, Kako, Highter, and McGraw (1998) found mixed results. They assessed use of Manner modifiers including gerunds, adverbs and postpositional phrases and discovered that while the pattern of co-occurrence supported previous findings (i.e. Manner modifiers appear with Manner verbs in English but with Path verbs in Spanish), the frequency of Manner modification use differed quite dramatically crosslinguistically. Taking such modification into consideration, Spanish speakers encoded Manner 72% of the time in

descriptions of static pictures and 79% of the time when describing dynamic videos. These findings highlight the importance of broader analyses of lexicalization and encoding, which take more than just the verb into consideration.

### **5.2.2.2 The Manner lexicon**

A second consequence of Talmy's typology proposed by Slobin (1996b; 1997; 2004b; 2006) relates to the nature of the lexicon with respect to the semantics of Manner.

#### **5.2.2.2.1 Types of Manner verbs**

It appears that not all Manner verbs are equal. Slobin (1997) argues for a two-tiered lexicon of Manner verbs: those that are relatively neutral and convey everyday activities such as *walking* or *running*, and those that are exceptional such as *dashing* and *scrambling*. All languages typically have a range of first-tier Manner verbs. However, they may be used more extensively in a satellite-framed language. For example, in translations from a verb-framed language such as French into a satellite-framed language such as Dutch, first-tier Manner verbs are often substituted for Path verbs. But what verb-framed languages primarily lack is the range of second-tier Manner verbs exhibited by satellite-framed languages, and this contributes to the issue that follows, i.e. the smaller lexicon of Manner verbs in general.

#### 5.2.2.2.2 Size of the Manner lexicon

Expression of Manner is the neutral option in satellite-framed languages. Therefore, when Manner is perceptually salient in an event, Slobin argues that speakers of these languages must “up the ante” with increased specificity. As a result of this pressure, satellite-framed languages possess huge lexicons of Manner verbs, particularly of the second-tier type, which each encode very fine-grained semantic features.

Slobin substantiates this assertion with evidence from a number of sources. For example, he notes single verbs in Spanish such as *deslizarse*, which can be translated as *creep*, *glide*, *slide*, *slip*, or *slither* in English (1997:458). In addition, comparisons of translations of literary novels illustrate the variety of Manner verb types in English (27) as compared to French (18) (2004a:199). Furthermore, Slobin provides diachronic evidence, noting the sheer number and diversity of new Manner verbs added to the lexicon of English from the sixteenth to the twentieth centuries, for instance. Although he has not completed a count of the Manner verb inventories of all languages, rough estimates are that a satellite-framed language such as English may have several hundred, whereas a verb-framed language such as Turkish has less than one hundred (2006:10-11).

Turning to Japanese, Slobin himself recognizes that predictions for an impoverished Manner lexicon in verb-framed languages in general may not be true of Japanese. Various morphosyntactic devices exist to talk about Manner in Japanese, most notable of which are perhaps mimetics. Indeed, a recent dictionary of iconic expressions in Japanese (Kakehi, Tamori, & Schourup, 1996) defines and illustrates a

vast number of Japanese mimetics in over 1300 pages comprising two volumes. Cautiously, Slobin states, “it remains to be determined whether recourse to sound symbolism allows a language to elaborate the domain of manner of motion in ways that parallel the large lexicons of manner verbs in the S-languages we have examined.” (2004b:235) However, his expectation was that the existence of mimetics does allow a language to be as fine-grained in descriptions of Manner as a language with a large collection of Manner verbs. If that were true, then we would expect Japanese to occupy a place higher up on the cline of Manner salience than other verb-framed languages without ideophonic resources, with the result that Japanese speakers would routinely talk about Manner explicitly more often.

Indeed research on literary translations of *The Hobbit* into Japanese repeating Slobin’s analyses partially reveals such a pattern. In separate studies, Ohara (2004) and Sugiyama (2005) found that, unlike translations into other verb-framed languages, Japanese translations of *The Hobbit* encoded almost as much Manner information as the original. However, Ohara revealed that Japanese texts actually contained almost as many verb types to express Manner as the original in English (21 versus 25).<sup>5</sup> Contrary to Slobin’s previous predictions, she discovered that the greatest variety of Manners was actually conveyed in verbs, often Manner-Path compound verbs, e.g. *odori-agaru* ‘jump-ascend’, as opposed to mimetics.

The findings above constitute a very important contribution to the characterization of verb-framed languages with respect to expression of Manner, but

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<sup>5</sup> Ohara’s analysis of verb types may have differed slightly from Slobin’s (2004a) leading to a small disparity in verb type counts (25 versus 27 respectively)

some caution is necessary. Analyses of Japanese were solely based on translations, in which it is assumed that the translator tried to stay as close to the original as possible within the confines of their lexicon. Under those circumstances, some of the effects of typological differences between English and Japanese (i.e. encoding of Manner and diversity of Manner lexicon) were reduced. However, it remains to be seen to what extent the same patterns are actually “*characteristic*” of Japanese in the way that Talmy’s typology was intended to capture:

*“characteristic means that (1) it is colloquial in style, rather than literary, stilted, and so on; (2) it is frequent in occurrence in speech, rather than only occasional; (3) it is pervasive, rather than limited – that is, a wide range of semantic notions are expressed in this type.”* (Talmy, 2000:27)

Thus, only with a range of data sources, including those from spontaneous narratives, can we fully observe the patterning of Manner expression in Japanese.

### **5.2.2.3 Expression of Manner in gesture**

The third consequence of Talmy’s original typology is an extension of the Slobinian line of research to the gestural domain, proposed by McNeill (1997). McNeill contrasts two examples of spoken utterances both accompanied by co-speech representational gestures in English. Both utterances encoded information about Manner and Path (*roll + down*), but only one of the gestures encoded Manner (hand rotating with fingers wiggling). This gesture, which simultaneously depicted a trajectory (hand moving outwards), was aligned with the entire Manner verb + Path satellite



construction. However, the other gesture was a Path-only gesture and was aligned with only the Path information in the utterance. McNeill interprets the existence of such examples as illustrations of English speakers using gesture, consciously or unconsciously, to either highlight or downplay semantic information, in this case Manner information.

McNeill further claims that what might be considered strategic use of gesture is restricted to first tier Manner verbs. If a second tier Manner verb had been used, the interlocutor would have been in no doubt as to the semantic intentions of the speaker, i.e. to draw attention to the Manner. But first tier Manner verbs are “verbs of minimal inherent marking whose Manner component is brought out via the gesture” (McNeill, 1997:258). McNeill states that speakers may even select a first tier Manner verb such as *roll* merely to represent motion of an agent without intending to convey that the agent really is rolling, and that such a situation would become clear with the absence of a gesture. While this does not seem likely and the statement is more of a proposal with no empirical support, the absence of such gestural marking on the first tier Manner verb, *roll*, may at least indicate that rolling does not hold special relevance for the discourse.

In reference to the example from English above, it is the absence of Manner gestures accompanying what McNeill terms “unintended” Manner in speech in English that contrasts with the strategy he argues is employed by Spanish speakers. Drawing on Slobin’s findings from Spanish and other verb-framed languages where Manner is typically not considered salient enough to mention, McNeill provides examples of Manner omitted from speech, but encoded in the gestures of Spanish speakers. Thus,

Spanish speakers who intend to communicate Manner but are constrained by the semantics and syntax of their language, recruit Manner gestures to overcome the constraints. McNeill describes further how, in the absence of a corresponding word with which to align, Manner gestures “blanket” an entire motion event description, which may go over several clauses, in a “Manner fog” (McNeill, 1997:258).

It is important to note first that it is not clear to what extent McNeill considers the gestural behaviors described above to be consciously strategic, and therefore it is not clear what the relationship between speech and gesture is in these particular cases and whether that differs for other cases, i.e. on the assumption that not all gesture is conscious, strategic behavior (see Gullberg, 1998, who problematizes the issue of “strategic” gesture in general). The second thing to note is that the hypotheses are not mirror images of each other. In the case of gesture downplaying Manner information in speech, the assumption is that talking about Manner is the default and Manner will either be encoded in accompanying gesture or not, yielding a (+ Manner speech, +/- Manner gesture) outcome. In the case of Manner fog, *not* talking about Manner is the default and Manner will be added in gesture or not, yielding a (- Manner speech, +/- Manner gesture) outcome.

#### **5.2.2.4 Implications for cognition**

A common theme underlying all the studies cited above is a focus on pure linguistic phenomena. However, an additional line of research focuses on whether and to what extent these kinds of linguistic phenomena impact cognition along the lines of

Whorfian linguistic determinism (Whorf, 1956), which broadly claims that the language one speaks determines the way one thinks. Berman and Slobin approached this issue rather cautiously, originally stating:

*“frequent use of [linguistic] forms directs attention to their functions, perhaps even making those functions (semantic and discursive) especially salient on the conceptual level. That is, by accessing a form frequently, one is also directed to the conceptual content expressed by that form”* (Berman & Slobin, 1994:640).

In later articulation of this line of thought, Slobin claimed that such a process is one of “typological determinism” in that “typology predisposes speakers towards certain types of *construal* or *conceptualization* of events” (Slobin, 2004a:197). The crux here is in strength of relationship between language and cognition. Unlike previous Whorfian claims, Slobin’s claim is restricted to the domain of linguistic cognition. Thus, it is the actual *use* of one’s language as constrained by linguistic patterns, as opposed to knowledge about one’s language, which affects perception and conceptualization of events but not general cognition of events.<sup>6</sup> This defines a process he describes as “thinking for speaking” (Slobin, 1996a). In other words, as discussed in Chapter 4, speakers are predicted typically to attend to the aspects of an event that their language has the readily available linguistic means to express. Over time, this habitual attention is predicted to lead to certain rhetorical styles, such as habitual encoding or non-encoding of Manner.

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<sup>6</sup> Many thanks go to Marianne Gullberg for extensive discussions on the difference between ‘linguistic cognition’ and ‘general cognition’.

Further work attempting to test the existence and strength of possible links between language and even linguistic cognition in this domain on the basis of experimental research using non-linguistic tasks has yielded conflicting results. Oh (2003, cited in Slobin, 2006) found crosslinguistic differences in recall of motion between English and Korean speakers, whereby English speakers recalled significantly more subtle details concerning different dimensions of Manner. Although Gennari, Sloman, Malt and Fitch (2002) did not find a difference between Spanish-speaking and English-speaking participants in motion recognition task, they did find a crosslinguistic difference in similarity judgments when the event had been described verbally prior to the judgment task. In contrast, a similar study by Papafragou, Massey and Gleitman (2002) found no crosslinguistic differences at all in memory and categorization tasks between English- and Greek-speaking adults and children, regardless of prior linguistic encoding.

Overall, it is clear that robust crosslinguistic differences exist in verbal encoding of Manner of motion, notwithstanding the subtle complexities that have emerged since the original publication of Talmy's typology. However, the picture is rather less clear for possible cognitive consequences of such differences. We now turn to how learners of a second language approach the acquisition of this semantic domain.

#### **5.2.2.5 Acquisition of Manner in a second language**

Although Manner is lexicalized in verbs in both verb- and satellite-framed languages, there is still much to be acquired for the learner of a second language.

Obviously learners must develop the lexical equivalents of words in their L1 in the L2, but this matter is complicated by the degree of specificity that the “second-tier” Manner verbs in particular encode in satellite-framed languages. Thus, the Spanish learner of English, when checking the dictionary for an appropriate translation of *deslizarse*, will be faced with a variety of options including *creep*, *glide*, *slide*, *slip*, or *slither* (Slobin, 1997:458).

In this review, we focus predominately on the role of transfer from the L1, since that is most relevant for the current study. The few empirical studies that exist on the acquisition of Manner in a second language are somewhat contradictory, but generally suggest that proficiency plays a role in the degree of L1 transfer. Montrul (2001) investigated the issue from the perspective of transitivity, exploiting the fact that Manner verbs in English can be both transitive and intransitive, e.g. *It rolls* and *I roll it*, but only intransitive in Turkish and Spanish. She tested intermediate learners of English with either Spanish or Turkish L1s and learners of Spanish with either English or Turkish L1s. She found errors of undergeneralization, where native Spanish and Turkish speakers incorrectly rejected cases of transitive Manner verbs in English, and errors of overgeneralization, where native English speakers, but not native Turkish speakers, incorrectly accepted cases of transitive Manner verbs in Spanish. These results signal significant L1 transfer during L2 acquisition of the subcategorization frames of Manner verbs.

Cadierno and Ruiz (2006) found rather less transfer than they had hypothesized, albeit with rather more advanced Danish and Italian learners of Spanish in an inter-

intra-typological study. Contrary to predictions, no differences were found in the number of Manner verbs, neither adverbial gerunds nor subordinated verbs, used by learners coming from a satellite-framed L1 (Danish) and moving to a verb-framed L2 (Spanish) as compared with learners for whom there was no typological distance between the L1 (Italian) and the L2. They claimed that this suggests a limited role for thinking for speaking in L2 acquisition at least at advanced levels. However, such results could also be explained from the perspective of lexical development, i.e. that Danish learners of Spanish could not be expected to use a higher number of Manner verbs or adverbials if they had not actually acquired the relevant the lexical items.

In a telling analysis of gesture as well as speech, Negueruela, Lantolf, Jordan, and Gelabert (2004) examined highly proficient Spanish learners of English and English learners of Spanish in a narrative retelling task. Although the populations were relatively small (twelve participants distributed across four participant groups) and did not allow for statistical comparisons, general patterns suggested transfer from the L1 in both L2 speech and gesture. Thus, L2 English speakers rarely encoded Manner in speech, but frequently added Manner information in gesture when it was not verbally expressed, a pattern resembling L1 Spanish in the so-called phenomenon of a “Manner fog”. Conversely, L2 Spanish speakers verbally expressed Manner much of the time, a pattern resembling L1 English.

Negueruela et al’s results on the number of Manner mentions by L2 learners of Spanish partially conflict with the Danish learners of Spanish in Cadierno & Ruiz’s (2006) study and point to lexical development being rather less of an issue for L2

Spanish particularly from an L1 English background. Of course, a higher number of cognates between Spanish and English could have played a role here. Moreover, some of these same L2 Spanish speakers encoded Manner in gesture even if it was not present in speech about half the time, a pattern resembling both L1 English and L1 Spanish. However, here the authors themselves invoked lexical development as an explanation as opposed to a shift in patterns of thinking for speaking, arguing that gesture was functioning as a lexical compensatory device in many of these cases, even at such high levels of L2 proficiency.

Finally, findings from Negueruela et al. were corroborated by Stam (2006), who also observed Spanish speakers of English at intermediate and advanced levels of proficiency. Again populations were rather small (five participants in each learner group), but only two learners talked, for example, about Sylvester's *rolling* down the hill, focusing instead on his descent. Furthermore, learners tended to gesture about Manner in its absence in speech. These patterns did not seem to be affected by proficiency level.

### **5.2.3 Summary**

In sum, although lexicalization of Manner does not vary across languages in the same way that lexicalization of Path varies, there are still substantial crosslinguistic differences in this domain which can be exploited in an investigation of crosslinguistic influence. We have seen that English, as a satellite-framed language, possesses an extensive array of Manner verbs, which express distinctions at a very fine-grained level.

Theorists also claim that, along with the distinct morphosyntactic packaging of Path in English, the high frequency and simple morphology of these verbs leads to ease of processing, which has consequences for frequency of encoding and potentially for linguistic cognition in the domain of Manner. On the other hand, Japanese, as a verb-framed language, was initially predicted to have a narrower repertoire of Manner verbs, to lexicalize Manner in verbal elements outside the main verb, and to frequently avoid encoding it altogether in spoken discourse, while potentially gesturing about it. However, an additional factor crucial for expression of Manner in Japanese is the existence of mimetics, which enable just as fine-grained distinctions as those made in English. Moreover, recent studies have revealed that Japanese literary translations include almost as much Manner information as the English original, and this is primarily achieved with compound verbs. Nonetheless, whether monolingual speakers of Japanese actually employ these resources online in spontaneous narratives to as great an extent remains to be seen.

Furthermore, as in expression of Path, there is again evidence from studies on second language acquisition of typological patterns for expressing Manner being at least partially transferred from the L1 to the L2 in speech, with consequences for gesture. Such transfer has been shown in knowledge of the subcategorization frames of Manner verbs, as well in encoding in speech and gesture, although it is difficult to tease apart the role of transfer versus the role of lexical acquisition in these latter issues.

At this point, then, we have reason to believe that when two typologically different systems for expressing Manner come into contact within one speaker, they will



interact. This has been confirmed for L2 production (although not specifically for Japanese learners of English), but has not yet been investigated in the L1 production of those who are in the process of acquiring a second language. We turn, therefore, to what we might predict for both the L1 and L2 production of native Japanese speakers with intermediate knowledge of English.

### **5.3 Predictions**

Assuming the existence of crosslinguistic influence in the domain of Manner expression, the following predictions are postulated for our three populations: monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in their L1 and L2. These predictions are subsequently summarized in Table 5.1. It is important to note that, just as in Chapter 4, predictions for the non-monolingual speakers are effectively educated guesses. While we know something about how emerging L2 expression of Manner is affected by the established L1, we know nothing about how established L1 expression of Manner might be affected by an emerging L2. Therefore, the predictions outlined below generally reflect the expectation that non-monolingual expression of Manner in L1 and L2 will be somewhere between monolingual expression of Manner in Japanese and English, as is often the case in specific L2 studies.

Prediction 1: Lexicalization of Manner: which morphosyntactic resources are primarily used to map Manner semantics.

*Monolingual Japanese speakers:* are predicted to lexicalize Manner in a narrow range of verbs, but also in adverbials, in particular mimetics.

*Monolingual English speakers:* are predicted to lexicalize Manner in a rather wide range of verbs. Adverbials such as comparison phrases (i.e. *like a ...*) are a possibility, but novel onomatopoeic constructions, the closest equivalent to Japanese mimetics, are not expected in discourse from adults.

*Non-monolingual Japanese speakers in L1:* are predicted to lexicalize Manner in both verbs and adverbials, to degrees differing from both groups of monolinguals. As a result, they may exhibit greater overall lexical variety than either group of monolinguals.

*Non-monolingual Japanese speakers in L2:* are predicted to lexicalize Manner in verbs to some degree, but this may be constrained by lexical knowledge, and as a result they may find alternative ways of lexicalizing Manner. However, the range of lexical types is expected to be somewhat narrower than that exhibited by other groups.

Prediction 2: Morphosyntactic distribution of Manner information in the clause: whether Manner expressions are concatenated within the clause

*Monolingual Japanese speakers:* if, Manner is expressed with a combination of lexical resources available to express Manner (verbs and mimetics), may concatenate more Manner expressions into each clause than other groups (in a way similar to that seen for Path expression in Chapter 4).

*Monolingual English speakers:* with lexicalization of Manner only in verbs, are predicted to pack only one Manner expression per clause.

*Non-monolingual Japanese speakers in L1:* may differ from monolingual Japanese speakers by packing fewer Manner expressions per clause, but more than monolingual English speakers.

*Non-monolingual Japanese speakers in L2:* may pack fewer Manner expressions per clause than other groups due to constraints on lexical knowledge, or conversely may pack more expressions than other groups as a variety of expressions are employed to clarify meaning.

Prediction 3: Encoding of Manner in speech: whether Manner is explicitly mentioned

*Monolingual Japanese speakers:* are predicted to encode Manner in spontaneous speech less often than monolingual English speakers due to the complexities involved in its lexicalization (compound or subordinated verb), although the existence of an extensive inventory of Manner expressions may actually result in the absence of a monolingual baseline difference in this area.

*Monolingual English speakers:* are predicted to encode Manner to a high degree.

*Non-monolingual Japanese speakers in L1:* may encode Manner more often than monolingual Japanese speakers, but less often than monolingual English speakers.

*Non-monolingual Japanese speakers in L2:* may encode Manner less often than other groups due to constraints on lexical knowledge.

Prediction 4: Encoding of Manner in gesture: whether Manner is depicted explicitly in gesture.

*Monolingual Japanese speakers:* are predicted to produce gestures encoding Manner particularly in cases where no Manner information is present in speech. In such circumstances, the Manner gesture should be distributed across the whole clause in a “Manner fog”.

*Monolingual English speakers:* are predicted to downplay Manner information by encoding it in speech but not in gesture.

*Non-monolingual Japanese speakers in L1:* are predicted to exhibit mixed patterns of gestural encoding of Manner, i.e. encoding Manner in gestures when it is not present in speech, but also encoding Manner in speech but not in gesture.

*Non-monolingual Japanese speakers in L2:* are also predicted to exhibit mixed patterns of gestural encoding of Manner, i.e. encoding Manner in gestures when it is not present in speech, which may result from lexical difficulty, but also encoding Manner in speech but not in gesture.

Table 5.1: Summary of predictions for expression of Manner (M) in speech and gesture in monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in L1 and L2

Predictions	Mono Japanese	Non-mono Japanese (L1)	Non-mono Japanese (L2)	Mono English
Lexicalization of M in the verb	✓	✓	✓	✓
Lexicalization of M in adverbials (e.g. mimetics, comparison phrases)	✓	✗/✓	✗/✓	✗
Concatenation of M expression within clause	✓	✗/✓	✗/✓	✗
Encoding of M in speech	✗	✗/✓	✗/✓	✓
M information in gesture but not in speech	✓	✗/✓	✗/✓	✗
M information in speech but not in gesture	✗	✗/✓	✗/✓	✓

## **5.4 Method**

### **5.4.1 Participants**

A total of 57 participants were included in the analyses involved in this study: 13 monolingual English speakers, 16 monolingual Japanese speakers, and 28 native Japanese speakers with intermediate knowledge of English. All of these individuals described the target motion events in speech. A subset of the participants also produced gestures accompanying their spoken descriptions. Speech and gesture data were analyzed separately. Biographical information for these groups can be found summarized in the general methodology section in Chapter 3 and detailed in Appendix I.

### **5.4.2 Stimuli**

Explanations and screen shots of these animated motion events can be found in the general methodology section in Chapter 3 and in Appendix II.

### **5.4.3 Procedure**

The procedure for data collection was as laid out in the general methodology section in Chapter 3.

#### 5.4.4 Manner speech coding

After segmenting spontaneous speech into verb clauses and isolating those that described the target motion events, narratives were coded for expression of Manner. Coding of Manner speech was conducted at three levels: word/expression, clause and discourse.

Although we began with Talmy's typology of verb-framing versus satellite-framing in lexicalization of Manner, coding of Manner elements in discourse for our purposes went beyond these original specifications. Thus, all elements lexicalizing information about the way in which the Figure underwent its translocational motion were coded as Manner, including adverbials (mimetics and comparison phrases). As with identification of Path semantics, previous studies on motion events were used as a guide for identifying Manner semantics (e.g. Jensen, 2002; Kita & Özyürek, 2003; Slobin, 1996b, 1997; Slobin, 2004b; Weingold, 1992, 1995). A full list of lexical items coded as Manner for each target motion event is displayed in Appendix III.

A second level of coding was conducted at the clausal level and determined how many Manner expressions appeared in each verb clause. Examples of this coding in English and Japanese appear in (9) - (11) with Manner expressions underlined.

(9) [and he climbs up the drainpipe]

(10) [de korokorokorokoro-to korogatte itte]

and Mimetic-Comp roll.Con go.Con

Lit: 'and (he) goes rolling ROUND ROUND'

- (11) [*suwingu*      *kou*      *furiko-no-youni*]  
       swing            like      pendulum-Gen-like  
       Lit: '(He) swings like a pendulum'

In example (9) from English, there is one Manner expression in a verb: *roll*. Example (10) from Japanese, however, contains two Manner expressions, one mimetic adverbial, *korokorokorokoro* 'round and round', and the other a Manner verb in combination with a Path verb in a complex motion predicate, *korogaru* 'roll'. Finally, example (11) also contains two Manner expressions, one a borrowed verb from English, *suwingu* 'swing', and the other an adverbial comparison phrase, *furiko-no-youni* 'like a pendulum'.

Finally, individual narratives were coded for whether Manner was mentioned at all in descriptions of target motion events or not. Results for speech analyses can be found in section 5.5.

#### 5.4.5 Manner gesture coding

Representational gesture strokes were isolated according to the procedure laid out in Chapter 3. Gestures were coded as exhibiting a Manner component if the gesture articulator(s) displayed movement that could be interpreted as depicting the Manner of a given event. This generally involved movement of fingers or rotation of the wrist, e.g. wiggling of fingers, twirling of the arm, or the portrayal of a climbing action, with or without a concurrent translocational movement from one point to another (Manner-Path conflated versus Manner-only gestures). In gestured descriptions of Rope Swing, arc-shaped gestures were coded as Manner-Path conflated gestures with the arc shape

reflecting the Manner component (swinging action). Since the arc itself could not be produced separately from the translocational movement in this particular gesture, no gestures were coded as Manner-only for this event.<sup>7</sup> Figure 5.1 shows stills of a typical Manner gesture produced in a description of Bowling Roll.



Figure 5.1: Stills from the production of a Manner gesture in the description of Bowling Roll

Analyses of Manner gestures consisted of identifying the extent to which the gesture overlapped with the semantics of the accompanying clause and narrative description as a whole. Examples of gesture coding processes as applied to clauses describing Bowling Climb appear below with individual gesture strokes indicated by boldface and numbered, and Manner expressions underlined.

(12) [ue-ni            **ikouto**            **surundakedo**<sup>1st</sup>]

up-to try.to.go            do.but

Lit: '(He) tries to go up but'

<sup>7</sup> Some might claim that an arc shape in gesture does not indicate Manner, but merely the shape of the Path trajectory. In answer to this objection, I would argue that salient trajectory shapes in gesture such as a gesture depicting a zig-zag shape is as much a Manner component for the Manner verb *zig-zag* as the arc shape is for the Manner verb *swing*. The problem of such gestures, of course, is that the Manner cannot be produced independently of the Path.



<sup>1st</sup> Manner gesture: rotation of wrist and movement of fingers, hand depicting a climbing action in place (i.e. without upwards trajectory); Manner information not present in accompanying speech

(13) [you see Sylvester *slithering up the*<sup>1st</sup> drainpipe]

<sup>1st</sup> Manner-Path conflated gesture: movement of fingers, fingers wiggling, depicting a climbing action, while moving in an upward trajectory; Manner information present in accompanying speech

In example (12), the clause with no spoken encoding of Manner is accompanied by a Manner gesture; hence, there was no semantic overlap between the speech and gesture. Example (13), on the other hand, shows full semantic overlap between speech and gesture whereby a verb clause with both Manner and Path encoding is accompanied by a Manner-Path conflated gesture. Results for Manner gesture analyses can be found in section 5.5.

## 5.5 Results

As discussed in Chapter 3, non-parametric procedures were used for all quantitative analyses. In line with Chapter 4, results are presented in five sections. We first present results from a number of analyses of L1 production in speech (section 5.5.1) and gesture (section 5.5.2). For these analyses, three main groups are compared: monolingual Japanese speakers (J), monolingual English speakers (E), and native Japanese speakers with intermediate knowledge of English in their L1 (J (E)). Second, we present results of analyses of L2 production in speech (section 5.5.3) and gesture

(section 5.5.4). For these analyses, native Japanese speakers with intermediate knowledge of English, this time in their L2 (E (J)), were compared to each of the monolingual groups: (E) and (J). Finally, within-subject analyses were conducted on the non-monolingual Japanese group in order to compare production of speech and gesture in their L1 and L2 (section 5.5.5). Prior to all primary analyses, the non-monolingual Japanese group resident in Japan was compared to its counterpart resident in the USA, and in the event of no differences between them, the data were collapsed to form one group of native Japanese speakers with intermediate knowledge of English.

### **5.5.1 Expression of Manner in L1 speech**

Analyses of Manner expression in speech were conducted to determine how participants lexicalized Manner, in the verb versus additional resources; whether participants concatenated Manner expressions within the clause; and the extent to which Manner was explicitly expressed in speech.

#### **5.5.1.1 Lexicalization of Manner in L1 narrative**

Prior to the quantitative analysis of predominant patterns of lexicalization, a qualitative analysis of the inventory of Manner expressions was conducted across L1 groups. Table 5.2 gives a breakdown by verb and adverbial of all lexical types used in all events to express Manner. For this analysis, non-monolingual groups in Japan and the USA have been treated separately in order to render the participant groups as comparable as possible in terms of participant numbers, otherwise it might look as

though non-monolingual speakers had a much greater variety of lexical types, when really there are just more participants.

Table 5.2: *Verb and adverbial lexical types used to express Manner across all events and L1 groups*

	Mono Japanese (J) n=15	L1 Non-mono Japanese Japan (J (E:Japan)) n=14	L1 Non-mono Japanese USA (J (E:USA)) n=12	Mono English (E) n=13
M verb types	<i>korogaru</i> 'roll' <i>moguru</i> 'dive' <i>suberu</i> 'slide' <i>tobu</i> 'fly' <i>yojiru~</i> 'clamber' <i>yurasu</i> 'swing' (trans)	<i>hashiru</i> 'run' <i>janpu-suru</i> 'do jump' <i>korogaru</i> 'roll' <i>moguru</i> 'dive' <i>shinobu</i> 'sneak' <i>suwingu</i> 'swing' <i>tobu</i> 'fly' <i>yojiru~</i> 'clamber' <i>yurasu</i> 'swing' (trans)	<i>janpu-suru</i> 'do jump' <i>kakeru</i> 'run' <i>korogaru</i> 'roll' <i>moguru</i> 'dive' <i>nagasareru</i> 'cause to be swept' <i>shinobu</i> 'sneak' <i>tobu</i> 'fly' <i>tsu~</i> 'barrel' <i>yojiru~</i> 'clamber' <i>yurasu</i> 'swing' (trans)	<i>climb</i> <i>crawl</i> <i>creep</i> <i>roll</i> <i>run</i> <i>slither</i> <i>squeeze</i> <i>swing</i>
M adverbial types	<i>buranko-no youni</i> 'resemble a swing' <i>buun</i> 'buzz' <i>byuu</i> 'whizz' <i>daa(n)</i> 'quickly and vigorously' <i>gaa</i> 'bang' <i>gorogoro</i> 'roll roll' <i>guruguru</i> 'roll roll' <i>korokoro</i> 'roll roll' <i>kuu</i> 'quickly and quietly' <i>taazan mitai ni</i> 'look like Tarzan' <i>taazan-no youni</i> 'resemble Tarzan'	<i>biyoon</i> 'stretch' <i>dondon</i> 'quickly' <i>furiko no youni</i> <i>gorogoro</i> 'roll roll' <i>korokoro</i> 'roll roll' <i>pyoon</i> 'jump' <i>syuu</i> 'whizz' <i>taazan mitai ni</i> 'look like Tarzan' <i>taazan-no youni</i> 'resemble Tarzan'	<i>byuu</i> 'whizz' <i>gaa</i> 'bang' <i>gorogoro</i> 'roll roll' <i>guwaa</i> 'move all at once quickly' <i>taazan mitai ni</i> 'look like Tarzan' <i>taazan-no youni</i> 'resemble Tarzan'	<i>like tarzan</i>

Regarding lexical types used to encode Manner, rather surprisingly all Japanese-speaking groups displayed a generally wider variety of Manner expressions than the monolingual English group, even in terms of the repertoire of Manner verbs. This may be explained by the degree of specificity that each lexical item encodes. Given that we know that English does have a wide range of Manner verbs with very fine-grained semantics, it is perhaps more likely for English monolinguals to converge on a relatively small number of expressions. If the semantics of Manner verbs are less fine-grained in Japanese, as in other verb-framed languages, then they might be expected to exhibit greater variation in lexical choices.

Somewhat striking is the apparent use of ad-hoc borrowings from English, e.g. *janpu-suru* ‘do jump’ and *suwingu* ‘swing’, only by native Japanese speakers with intermediate L2 English. At first this may appear to be a clear case of lexical influence from English. However, there are two factors to consider. The first is that compared to other Manner expressions, these were rather rare: one case of *janpu-suru* and one case of *suwingu* among non-monolingual Japanese speakers resident in Japan, and one case of *janpu-suru* among non-monolingual Japanese speakers resident in the USA. Second, these borrowings were not completely absent from monolingual Japanese narratives, just absent from the events analyzed here. *Suwingu*, for example, was used by a Monolingual Japanese speaker to describe an instance of Tweety’s swinging on a swing. Due to the small number of occurrences in this particular corpus, analysis of borrowings was not pursued further. However, this may constitute an area of future research with a slightly larger dataset.

However, substantial qualitative difference between the range of verbs and adverbials employed by monolingual Japanese versus native Japanese speakers with intermediate L2 English was clear. More specifically, non-monolingual Japanese speakers exhibited a wider range of verbs than monolingual Japanese, whose lexical diversity lay in adverbial expressions. In order to see if such a qualitative difference reflects a robust difference in lexicalization patterns, a quantitative analysis of use of each of the different morphosyntactic devices is needed.

In the quantitative analysis of Manner lexicalization, adverbial usage was divided into mimetic adverbial and adverbial comparison because the category of mimetic adverbial does not really exist in English. The equivalent of a mimetic in English would be a novel onomatopoeic, and because this was not expected, crosslinguistic influences from English would be easier to see in a separate analysis of adverbial comparisons, a category that exists in both English and Japanese. Therefore, three possible patterns were distinguished: verb, mimetic adverbial, and adverbial comparison. These categories are illustrated in (9) – (11) above. Table 5.3 shows a summary of the mean number of Manner verbs, mimetics and comparison adverbials per clause employed in all target clauses containing Manner across L1 groups.

Table 5.3: *Mean number (SD) of Manner verbs, mimetics and comparison adverbials per clause employed in all clauses including Manner across L1 groups*

	Mono Japanese (J) n=15	L1 Non-mono Japanese Japan (J (E:Japan)) n=14	L1 Non-mono Japanese USA (J (E:USA)) n=12	Mono English (E) n=13
M verb	.79 (.26)	.80 (.30)	.72 (.39)	1 (0)
M mimetic	.38 (.51)	.25 (.31)	.15 (.31)	0 (0)
M comparison	.13 (.28)	.18 (.21)	.22 (.32)	.03 (.08)

A Mann-Whitney  $U$  test indicated no significant differences between the two sub-groups of non-monolinguals, i.e. those resident in Japan versus the USA, for number of Manner verbs ( $z = -.316$ ,  $p = .752$ ), for number of Manner mimetics ( $z = -1.232$ ,  $p = .218$ ), or for number of Manner comparison ( $z = -.028$ ,  $p = .978$ .) Due to the absence of a difference, these two sub-groups were collapsed for the subsequent analyses to form one group of non-monolingual Japanese speakers performing in their L1 (J (E)).

Next, three separate analyses were conducted to evaluate differences between language groups in production of each option for Manner lexicalization. Figure 5.2 shows an error bar plot illustrating mean number of Manner verbs in all clauses containing Manner across the three main L1 groups.

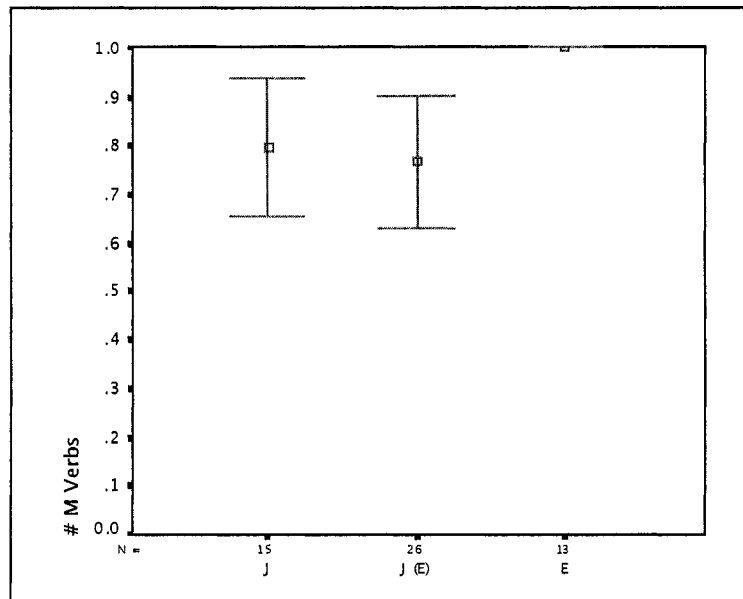


Figure 5.2: Mean number of Manner verbs per clause in all clauses containing Manner across three L1 groups: J (monolingual Japanese speakers), J (E) (native Japanese speakers with intermediate L2 English), and E (monolingual English speakers)

A Kruskal-Wallis test showed a significant difference in mean number of Manner verbs per clause between groups:  $\chi^2(2, N=54) = 8.004, p = .018$ . Follow-up tests showed that, as expected, all monolingual English speakers used Manner verbs in clauses containing Manner, which exceeded verb use by either of the two groups of Japanese speakers (monolingual and non-monolingual). Contrary to possible predictions, the new combined group of Japanese speakers with intermediate L2 English did not significantly differ from their monolingual Japanese counterparts.

Figure 5.3 shows an error bar plot illustrating mean number of Manner mimetics per clause in all clauses containing Manner across the three main L1 groups.

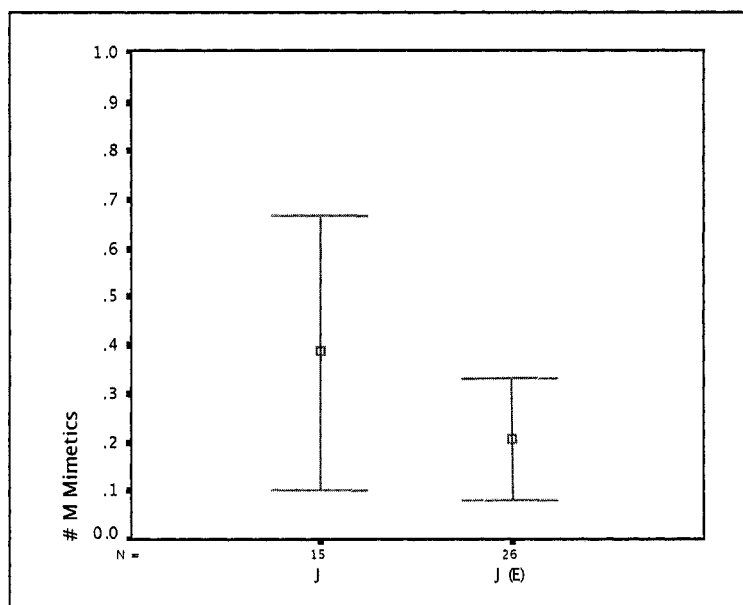


Figure 5.3: Mean number of Manner mimetics per clause in all clauses containing Manner across three L1 groups: J, J(E), and E

As monolingual English speakers employed no novel onomatopoeic expressions at all, they were not included in the statistical test. A Mann-Whitney test showed no significant difference in mean number of Manner mimetics per clause used by

monolingual Japanese speakers and the combined group of non-monolingual Japanese speakers:  $z = -.822$ ,  $p = .411$ . However, bearing in mind their greater lexical variety in adverbial usage, there may be a trend for monolingual Japanese to employ more mimetics than non-monolingual Japanese speakers. Although the monolingual Japanese exhibited substantial variability, this was not distributed bi-modally.

Figure 5.4 shows an error bar plot illustrating number of Manner comparisons per clause in all clauses containing Manner across the three main L1 groups.

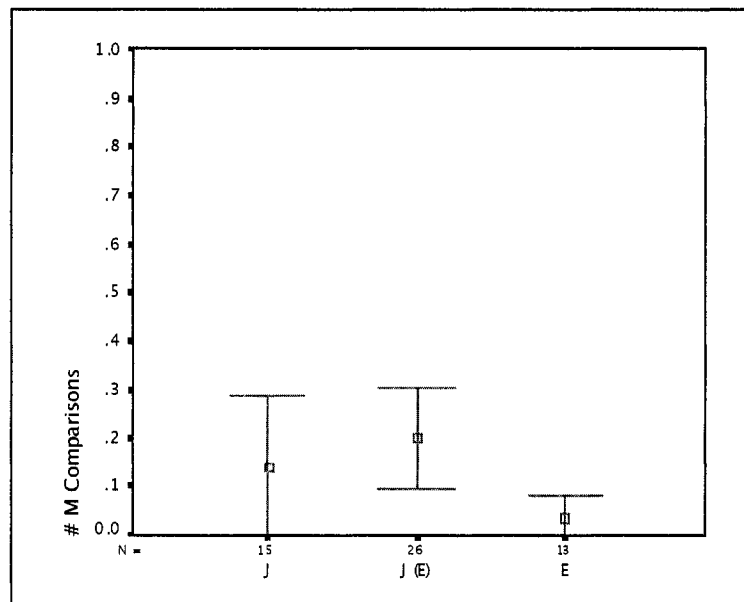


Figure 5.4: *Mean number of Manner comparisons per clause in all clauses containing Manner across three L1 groups: J, J(E), and E*

A Kruskal-Wallis test revealed no significant differences in mean number of Manner comparisons per clause used by monolingual Japanese speakers, the combined group of non-monolingual Japanese speakers, and monolingual English speakers:  $\chi^2(2, N=54) = 4.940$ ,  $p = .085$ . Thus, no group produced significantly more comparison phrases to describe Manner. However, there may be a trend the reverse of that observed



for mimetics, i.e. for non-monolingual Japanese to employ more adverbial comparisons than monolingual Japanese speakers.

To sum up the analysis of lexicalization patterns, we have seen that as predicted, monolingual English speakers lexicalize Manner in the verb significantly more often than Japanese speakers, regardless of whether those Japanese speakers know English. Conversely, Japanese speakers use significantly more mimetics and slightly more adverbial comparisons than monolingual English speakers. Finally, there may be an intra-language trend for monolingual Japanese speakers to prefer mimetics and for non-monolingual Japanese speakers to prefer adverbial comparison, although this is not significant and the variability is rather high.

#### **5.5.1.2 Concatenation of Manner expressions in L1**

The preceding results, showing a variety of lexical types employed to encode Manner in Japanese discourse, make our original predictions for greater concatenation of Manner expression within the Japanese clause even stronger. With such lexical resources in productive use, Japanese speakers may pack a Manner verb as well as at least one adverbial into each and every clause to facilitate unusually detailed descriptions. Table 5.4 shows the mean number of Manner expressions of any kind per clause employed in all target clauses containing Manner across L1 groups.

Table 5.4: Mean number (SD) of Manner expressions (verbs and adverbials) per clause employed in all clauses including Manner across L1 groups

	Mono Japanese (J) n=15	L1 Non-mono Japanese Japan (J (E:Japan)) n=14	L1 Non-mono Japanese USA (J (E:USA)) n=12	Mono English (E) n=13
M expressions	1.31 (.53)	1.23 (.30)	1.10 (.18)	1.03 (.08)

A Mann-Whitney U test showed no significant difference between the two sub-groups of non-monolinguals ( $z = -1.296$ ,  $p = .195$ ). As a result, these two sub-groups have again been collapsed.

Figure 5.5 shows an error bar plot illustrating mean number of Manner expressions per clause in all clauses containing Manner across the three main L1 groups.

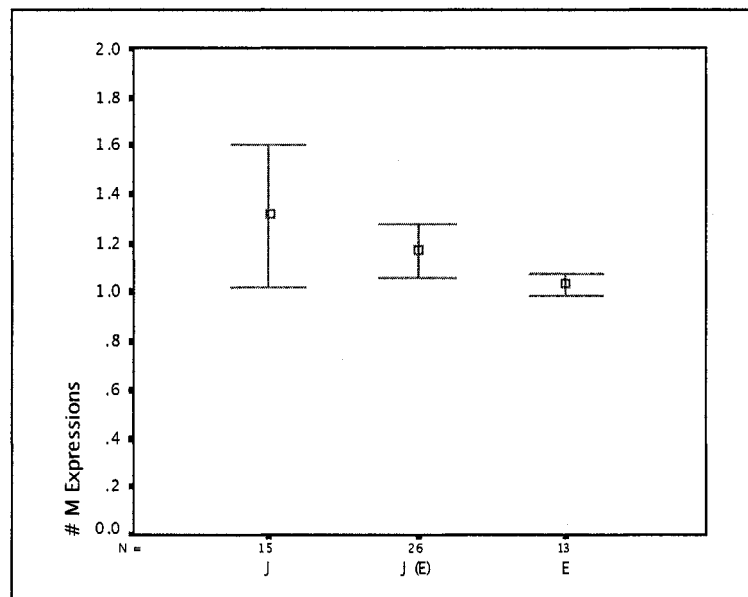


Figure 5.5: Mean number of Manner expressions per clause in all clauses containing Manner across three L1 groups: J, J (E), and E

A Kruskal-Wallis test showed no significant differences in mean number of Manner expressions per clause used by monolingual Japanese speakers and the combined group of non-monolingual Japanese speakers, and monolingual English speakers:  $\chi^2(2, N=54) = 4.461, p = .107$ . Again, the monolingual Japanese group exhibited substantial variability, but it was not distributed bi-modally. Therefore, regardless of lexicalization differences, no group packed significantly more Manner expressions per clause than any other.

### **5.5.1.3 Encoding of Manner in L1**

Concluding our analyses of expression of Manner in L1 speech, we test the extent to which Manner was encoded in speech. Recall that speakers of verb-framed languages generally encode Manner less often than speakers of satellite-framed languages. However, we have seen that despite expected differences in lexicalization, Japanese speakers, monolingual or otherwise, have a surprisingly wide array of lexical items at their disposal and they pack at least as many Manner expressions per clause than monolingual English speakers. Thus, it is an open question whether Japanese speakers encode Manner in speech less often than English speakers.

Table 5.5 shows a two-tiered summary of the mean proportion of clauses encoding Manner out of all the clauses describing the target motion and the mean proportion of descriptions encoding Manner out of all the descriptions relating to the target motion across L1 groups.

Table 5.5: Mean proportion (SD) of clauses encoding Manner per total number of target motion clauses and mean proportion of descriptions encoding Manner per total target event descriptions across L1 groups

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
Mean prop. clauses with M	.32 (.15)	.34 (.20)	.38 (.25)	.80 (.15)
Mean prop. narr's with M	.46 (.21)	.55 (.24)	.61 (.28)	.98 (.07)

The preliminary Mann-Whitney  $U$  test indicated no significant differences between the two sub-groups of non-monolinguals for mean proportion of clauses with Manner encoding per total motion clauses ( $z = -.601$ ,  $p = .548$ ) or for mean proportion of descriptions with Manner encoding per total event descriptions ( $z = -.754$ ,  $p = .451$ ). Thus, these two sub-groups have been collapsed.

Figure 5.6 contains an error bar plot illustrating mean proportion of clauses with Manner encoding per total target motion clauses across the three main L1 groups.

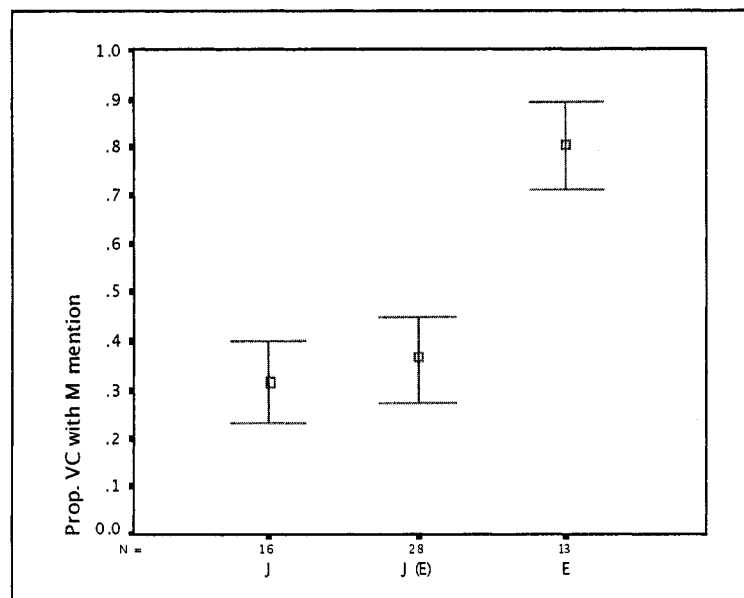


Figure 5.6: Mean proportion of clauses with Manner encoding per total target motion clauses across three L1 groups: J, J (E), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of clauses encoding Manner per total motion clauses between groups:  $\chi^2(2, N=57) = 25.182, p < .001$ . Follow-up tests revealed that, as predicted, monolingual English speakers encoded Manner in a significantly higher proportion of clauses than both groups of Japanese speakers. Contrary to predictions, no significant intra-language differences between monolingual and the combined group of non-monolingual Japanese speakers were found.

At the discourse level, the picture was much the same. Figure 5.7 shows an error bar plot illustrating the mean proportion of event descriptions encoding Manner per total target event descriptions across the three main L1 groups.

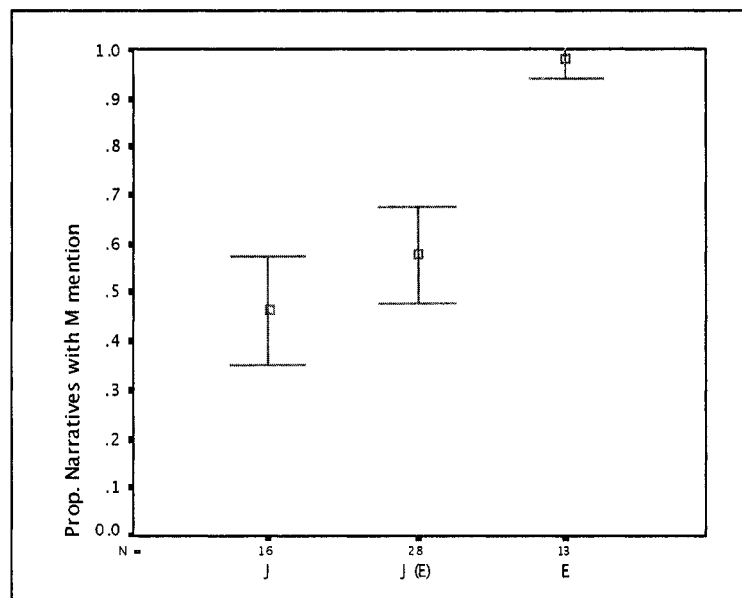


Figure 5.7: Mean proportion of event descriptions encoding Manner per total event descriptions across three L1 groups: J, J(E), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of event descriptions encoding Manner per total target event descriptions between groups:  $\chi^2(2, N=57) = 27.952, p < .001$ . Follow-up tests again revealed that monolingual English speakers encoded Manner in a significantly higher proportion of event descriptions than both groups of Japanese speakers, who were also rather more variable. Again no significant intra-language differences were found at the discourse level.

In sum, despite similarities in number of Manner expressions per clause when Manner was encoded, there was a clear crosslinguistic difference in propensity to encode Manner at the level of the clause and the level of discourse, with English speakers explicitly talking about Manner more often than Japanese speakers. This apparent contradiction will be reconciled in the discussion. Even though no significant intra-language differences were found in this domain between monolingual and non-monolingual Japanese speakers to suggest crosslinguistic influence of an L2 on an L1, there were very slight trends in the predicted direction. Given these results, the necessity for an analysis of gesture becomes all the more compelling.

### **5.5.2 Expression of Manner in L1 gesture**

We have seen that, as expected, there are crosslinguistic differences in encoding of Manner in speech. However, previous research has shown that semantic overlap between speech and gesture plays an additional role in these crosslinguistic differences. In the following analyses two hypotheses were tested. First, to investigate the “Manner fog” hypothesis, we examined how often speakers omitted Manner from speech but

added it in gesture. Japanese speakers were predicted to exhibit Manner fog in gesture. Second, to investigate the idea that gesture “downplays” Manner information in speech, we examined how often Manner was encoded in speech but not in accompanying gesture, leaving a gesture encoding only Path. English speakers were predicted to exhibit Path gestures downplaying Manner speech. It is important to note that the Manner fog hypothesis is not the logical inverse of the downplay Manner hypothesis. In other words, participants not exhibiting Manner fog would simply be talking and gesturing about Path. In contrast, participants not downplaying Manner information would be talking and gesturing about Manner (and probably also about Path).

Table 5.6, then, shows the mean proportion of gestures expressing Manner when no Manner was present in the accompanying clause out of the total number of motion gestures, as well as the mean proportion of motion gestures expressing only Path when Manner appeared in the accompanying clause out of the total number of motion gestures. As not all participants gestured, only a subset of participants are included in these analyses.<sup>8</sup>

Table 5.6: *Mean proportion of motion gestures expressing Manner when no Manner was present in the accompanying clause (Manner fog) per total motion gestures and the mean proportion of gestures expressing only Path when Manner appeared in the accompanying clause (Manner downplay) per total motion gestures*

	Mono Japanese (J) n=13	L1 Non-mono Japanese Japan (J (E:Japan)) n=10	L1 Non-mono Japanese USA (J (E:USA)) n=12	Mono English (E) n=11
M. fog	.11 (.12)	.04 (.07)	.06 (.12)	0 (0)
M. downplay	.17 (.27)	.35 (.32)	.39 (.37)	.58 (.22)

<sup>8</sup> In order for participants to be included in the gesture analyses, they had to contribute at least one gesture in a description of any of the four events.

A Mann-Whitney U test indicated no significant differences between the two sub-groups of non-monolinguals for mean proportion of Manner gestures with no Manner in accompanying clause ( $\underline{z} = -.084$ ,  $\underline{p} = .933$ ) or mean proportion of gestures expressing only Path with Manner in accompanying clause ( $\underline{z} = -.200$ ,  $\underline{p} = .841$ ). Thus, these two sub-groups have been collapsed.

Figure 5.8 contains an error bar plot illustrating mean proportion of motion gestures encoding Manner where no Manner information was present in the accompanying clause (Manner fog) out of all motion gestures across the three main L1 groups.

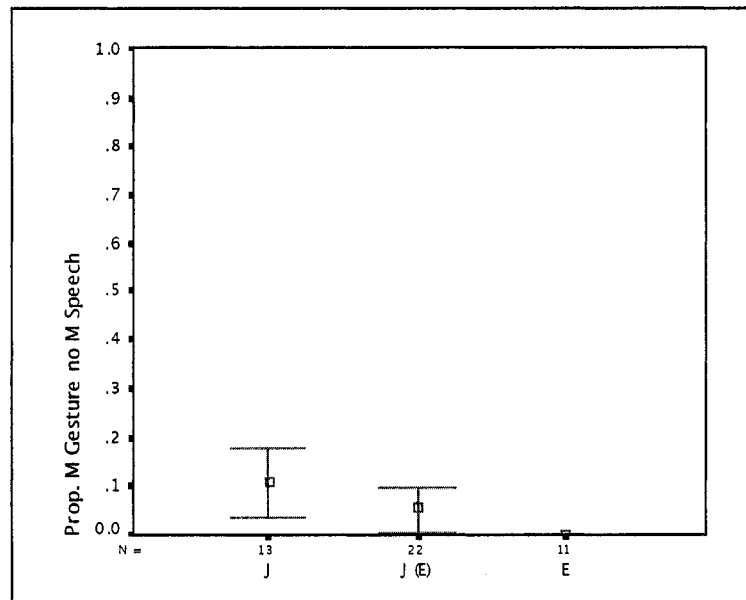


Figure 5.8: Mean proportion of motion gestures expressing Manner with no Manner information in accompanying clause (Manner fog) per total motion gestures across the three main L1 groups: J, J (E), and E

As monolingual English speakers never exhibited evidence of the Manner fog, they were not included in the statistical test. A Mann-Whitney test showed no significant difference in mean proportion of gestures expressing Manner with no



Manner in the accompanying clause per total motion gestures between monolingual Japanese speakers and the combined group of non-monolingual Japanese speakers:  $z = -1.595$ ,  $p = .111$ .

Finally, Figure 5.9 illustrates with an error bar plot the mean proportion of gestures expressing only Path when Manner was present in the accompanying clause out of all motion gestures across the three main L1 groups.

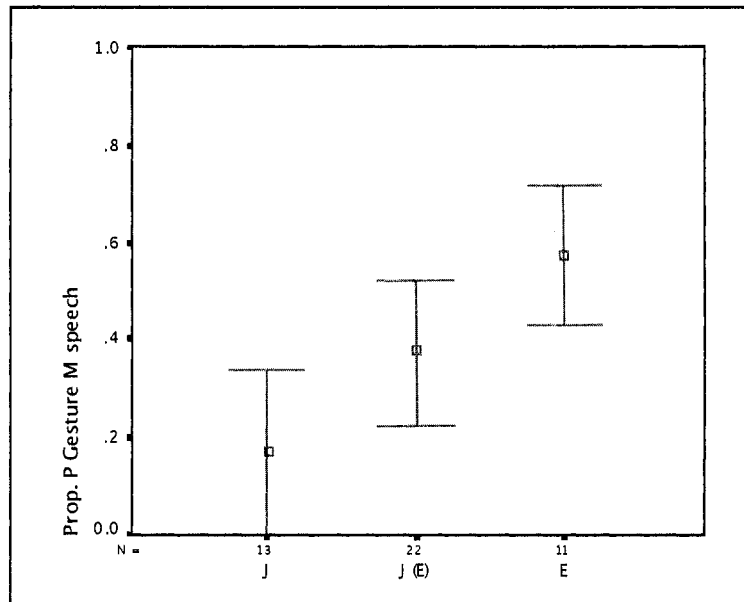


Figure 5.9: Mean proportion of gestures expressing Path alone when Manner was present in accompanying clause out of all motion gestures across the three main L1 groups: J, J (E), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of gestures expressing Path alone when Manner was present in the accompanying clause out of all motion gestures between groups:  $\chi^2(2, N=46) = 11.195$ ,  $p = .004$ . Follow-up comparisons this time revealed significant differences between all three groups. Monolingual English speakers produced a greater proportion of Path only gestures while talking about Manner in the accompanying clause than the combined group of

non-monolingual Japanese speakers, who in turn produced a greater proportion of Path only gestures in contexts of Manner speech than monolingual Japanese speakers.

In sum, analyses of gesture show crosslinguistic and intra-language differences. On one hand, Japanese speakers, monolingual and non-monolingual, exhibit instances of Manner fog in gesture, while monolingual English speakers do not. However, the proportions are rather small even in Japanese, suggesting that although Japanese speakers do gesture about Manner in its absence in speech, it is not the preferred pattern. Furthermore, there may be an intra-language trend for monolingual Japanese speakers to exhibit more instances of Manner fog in gesture than non-monolingual Japanese speakers, although this is not significant and the variability is rather high given the overall proportions.

On the other hand, when monolingual English speakers talk about Manner, they exhibit Manner downplay in gesture, tending to gesture only about Path significantly more often in comparison to Japanese speakers in general. However, the crucial finding here is the intra-language one. More specifically, when non-monolingual Japanese speakers encode Manner in speech, they also exhibit Manner downplay in gesture, tending to gesture only about Path significantly more often in comparison to monolingual Japanese speakers.

### **5.5.3 Expression of Manner in L2 speech**

Parallel analyses of Manner expression were conducted in the L2 speech of the same native Japanese speakers with intermediate knowledge of English to determine

how L2 speakers lexicalized Manner, in the verb versus additional resources; whether L2 speakers concatenated Manner expressions within the clause; and the extent to which Manner was explicitly expressed in L2 speech. Results for L2 production are shown below with the “target” monolingual English results and “source” monolingual Japanese results repeated for ease of comparison.

### 5.5.3.1 Lexicalization of Manner in L2 narrative

Prior to the quantitative analysis of predominant patterns of lexicalization in the L2, a qualitative analysis of the inventory of Manner expressions was conducted. Table 5.7 gives a breakdown by verb and adverbial of all lexical types used in all events to express Manner. For this analysis, non-monolingual groups in Japan and the USA have again been treated separately in order to render the participant groups as comparable as possible in terms of participant numbers.

Table 5.7: *Verb and adverbial lexical types used to express Manner across all events in L2 and monolingual groups*

	Mono Japanese (J) n=15	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=13
M verb types	<i>korogaru</i> ‘roll’ <i>moguru</i> ‘dive’ <i>suberu</i> ‘slide’ <i>tobu</i> ‘fly’ <i>yojiru</i> ~ ‘clamber’ <i>yurasu</i> ‘swing’ (trans)	<i>climb</i> <i>fly</i> <i>jump</i> <i>roll</i> <i>run</i> <i>suck</i> <i>swing</i>	<i>climb</i> <i>fly</i> <i>jump</i> <i>roll</i> <i>round</i> (v) <i>sneak</i> <i>swing</i>	<i>climb</i> <i>crawl</i> <i>creep</i> <i>roll</i> <i>run</i> <i>slither</i> <i>squeeze</i> <i>swing</i>
M adverbial types	<i>buranko-no youni</i> ‘resemble a swing’ <i>buun</i> ‘buzz’	<i>like tarzan</i> <i>roll</i> (non-verb use)	<i>like a pendulum</i> <i>like tarzan</i>	<i>like tarzan</i>

	<i>byuu</i> 'whizz' <i>daa(n)</i> 'quickly and vigorously' <i>gaa</i> 'bang' <i>gorogoro</i> 'roll roll' <i>guruguru</i> 'roll roll' <i>korokoro</i> 'roll roll' <i>kuu</i> 'quickly and quietly' <i>taazan mitai ni</i> 'look like Tarzan' <i>taazan-no youni</i> 'resemble Tarzan'			
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The most striking observation from the list of lexical types above is that, in general, the L2 lexical inventory for expression of Manner is not particularly out of the ordinary in comparison to the target. There are a couple of anomalies, of course. One relatively trivial (in terms of communicating meaning) irregularity, for example, is in the use of *round* as a verb in place of *roll*. A relatively more serious inaccuracy is the use of *suck* to describe Sylvester's rolling into the bowling alley. It is difficult to infer exactly what was meant by *suck* in this context, and indeed a bit of an assumption to have coded this as a Manner verb at all. Since this verb was used in passive and passive forms in Japanese are used particularly to express the negative impact on the protagonist of an external action or situation, the verb was interpreted to mean the negative nature of the movement into the bowling alley caused by the bowling ball, i.e. the Manner of rolling. One might speculate in this a case that the choice of verb construction has been influenced by the L1, but not the choice of lexical item itself. Finally, there were a couple of expressions used in English corresponding to those in

Japanese, e.g. *like a pendulum*, but interestingly, these were used by different participants in L2 and the L1.

Overall, it appears from a qualitative analysis that learners look rather target-like in lexicalization of Manner. There is little evidence that speakers are influenced by their L1 in choice of L2 items, and they pattern much like English monolinguals converging on a relatively small number of expressions. However, in order to fully test the extent of target-like behavior, we must look at the distributional nature of Manner lexicalization to see if morphosyntactic preferences also look target-like.

In the quantitative analysis of Manner lexicalization the same three patterns were distinguished: verb, mimetic adverbial, and adverbial comparison. Although mimetics do not really exist in English, they do exist in the learners' L1; hence, it was conceivable for Japanese learners of English to create novel onomatopoeics in their L2. Table 5.8 shows a summary of the mean number of Manner verbs, mimetics and comparison adverbials per clause employed in all target clauses containing Manner in both L2 groups compared with target and source groups.

Table 5.8: Mean number (SD) of Manner verbs, mimetics and comparison adverbials per clause employed in all clauses including Manner in L2 and monolingual groups

	Mono Japanese (J) n=15	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=13
M verb	.79 (.26)	.98 (.07)	.98 (.12)	1 (0)
M mimetic	.38 (.51)	0 (0)	0 (0)	0 (0)
M comparison	.13 (.28)	.06 (.13)	.09 (.12)	.03 (.08)

Since no L2 speakers produced novel onomatopoeic constructions to express Manner, no further comparisons were made in this area. First, a Mann-Whitney U test indicated no significant difference between the two sub-groups of L2 speakers, i.e. those resident in Japan versus the USA, for number of Manner verbs ( $z = -.038$ ,  $p = .970$ ) or for number of Manner comparison ( $z = -.608$ ,  $p = .543$ ). Therefore, these two sub-groups were collapsed to form (E (J)).

Next, analyses were conducted to evaluate production of both options for Manner lexicalization in the L2. Figure 5.10 shows an error bar plot illustrating mean number of Manner verbs per clause in all clauses containing Manner across L2 and monolingual groups.

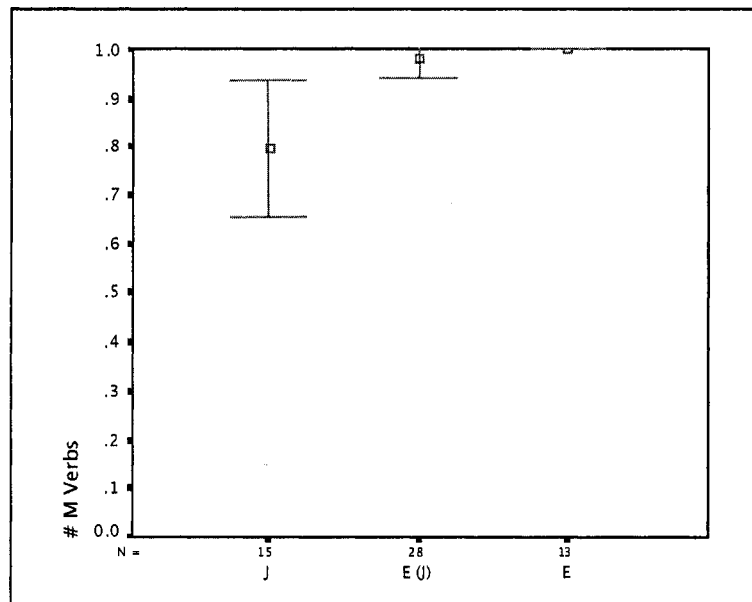


Figure 5.10: Mean number of Manner verbs per clause in all clauses containing Manner across L2 and monolingual groups: J (monolingual Japanese speakers), E (J) (native Japanese speakers with intermediate L2 English), and E (monolingual English speakers)

A Kruskal-Wallis test showed a significant difference in mean number of Manner verbs per clause between groups:  $\chi^2(2, N=56) = 12.562$ ,  $p = .002$ . Follow-up

tests revealed no significant difference in Manner verb use between the combined group of L2 speakers L2 speakers and monolingual English speakers. In contrast, L2 speakers used significantly more Manner verbs than monolingual speakers of the source language, Japanese. Therefore, intermediate learners of English performed in a target-like way with respect to number of verbs used to express Manner.

Figure 5.11 shows an error bar plot illustrating number of Manner comparisons per clause in all clauses containing Manner across L2 and monolingual groups.

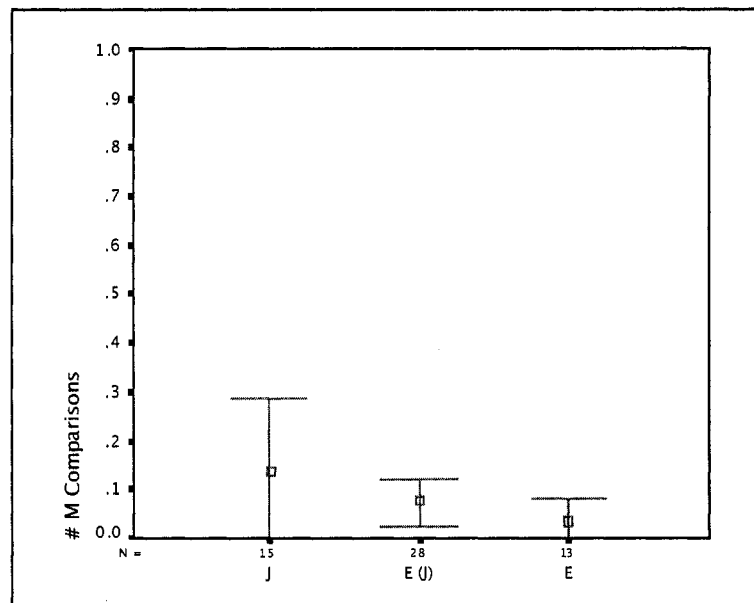


Figure 5.11: Mean number of Manner comparisons per clause in all clauses containing Manner across L2 and monolingual groups: J, E (J), and E

A second Kruskal-Wallis test showed no significant differences in mean number of Manner comparisons per clause used by the combined group of L2 speakers, monolingual English speakers, and monolingual Japanese speakers:  $\chi^2 (2, N=56) = 1.154, p = .562$ . Thus, L2 speakers, with surprisingly little variation, appeared quite

target-like and did not appear to use this option to circumvent any lexical difficulties in Manner verb production.

In sum, in the arena of Manner lexicalization, L2 speakers appear remarkably target-like, lexically and distributionally.

### **5.5.3.2 Concatenation of Manner expressions in L2**

There was no clear prediction for whether L2 speakers would or would not concatenate Manner expressions within the clause. On the one hand, they might be expected to do so in circumstances of lexical difficulty as they tried a variety of phrases to convey their intended meaning. Of course, such a strategy could cross multiple clauses. On the other hand, if few lexical items were actually available, they would be unable to concatenate Manner expressions. At this point, it is fairly clear that neither of these scenarios seems to match the data. L2 English speakers used Manner verbs to the same degree as monolingual English speakers and exhibited comparable lexical repertoires for doing so. Thus, we should predict the degree of concatenation of Manner expression within the clause in L2 to resemble the target, and this is indeed what we find.

Table 5.9 shows the mean number of all kinds of Manner expressions per clause employed in all target clauses containing Manner in L2 and monolingual groups.



Table 5.9: Mean number (SD) of Manner expressions (all types) per clause employed in all clauses including Manner across L2 and monolingual groups

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=13
M expressions	1.23 (.36)	1.04 (.10)	1.06 (.15)	1.11 (.22)

The Mann-Whitney  $U$  test showed no significant difference between the two sub-groups of L2 speakers ( $z = -.586$ ,  $p = .558$ ), allowing these two sub-groups to be collapsed.

Figure 5.12 shows an error bar plot illustrating mean number of Manner expressions (all types) per clause in all clauses containing Manner across the L2 and monolingual groups.

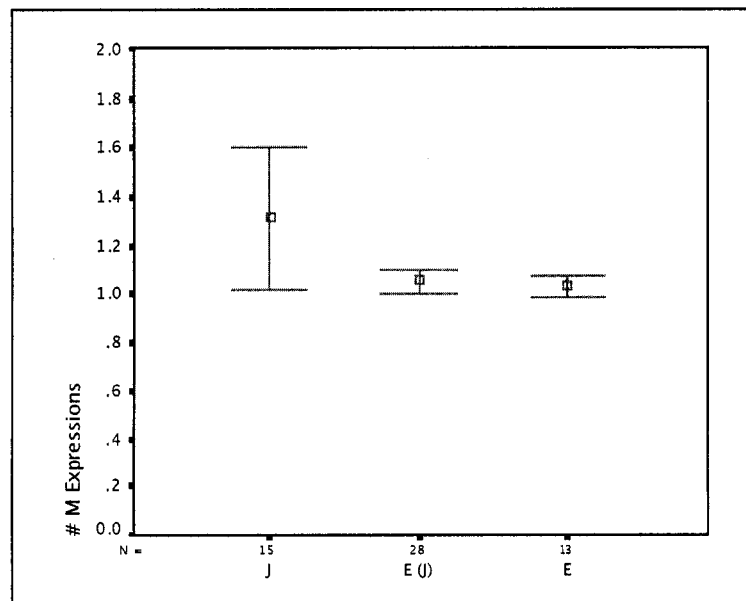


Figure 5.12: Mean number of Manner expressions (all types) per clause in all clauses containing Manner across groups: J, E (J), and E

A Kruskal-Wallis test indicated a significant difference in mean number of Manner expressions used per clause between groups:  $\chi^2(2, N=56) = 6.732, p = .035$ . Follow-up tests revealed crucially that the combined group of L2 speakers packed the same number of Manner expressions into clauses as monolingual speakers of the target language, English. Furthermore, monolingual speakers of the source language, Japanese, packed significantly more Manner expressions than L2 speakers and monolingual English speakers (a monolingual baseline result not revealed the previous L1 analysis). Overall, in this domain, as in previous domains, L2 speakers can be characterized as target-like.

### **5.5.3.3 Encoding of Manner in L2**

Concluding our analyses of expression of Manner in L2 speech, we examine the extent to which Manner was encoded in speech. There were no clear predictions for this question. However, since the L2 speakers in this study have established themselves as target-like in all previous parameters of Manner expression analyzed, we should expect them to be target-like in this last domain. On the other hand, previous analyses were based on the assumption that Manner was actually expressed, and given that situation, the various ways in which it was done. However, an option not yet considered for L2 production is whether, owing to lexical constraints or otherwise, encoding of Manner was avoided in descriptions of motion events.

Table 5.10 shows a two-tiered summary of the mean proportion of clauses encoding Manner out of all the clauses describing the target motion and mean

proportion of descriptions encoding Manner out of all the descriptions relating to the target motion across L2 and monolingual groups.

Table 5.10: *Mean proportion (SD) of clauses encoding Manner per total number of target motion clauses and mean proportion of descriptions encoding Manner per total target event descriptions across L2 and monolingual groups*

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=13
Mean prop. of clauses with M	.32 (.15)	.44 (.21)	.50 (.23)	.80 (.15)
Mean prop. of narr's with M	.46 (.21)	.67 (.26)	.69 (.29)	.98 (.07)

The Mann-Whitney U test indicated no significant differences between sub-groups of L2 speakers for mean proportion of clauses with Manner ( $z = -.785$ ,  $p = .432$ ) or for mean proportion of narratives with Manner ( $z = -.378$ ,  $p = .705$ ), allowing these sub-groups to be collapsed.

Figure 5.13 contains an error bar plot illustrating mean proportion of clauses with Manner encoding per total target motion clauses across L2 and monolingual groups.

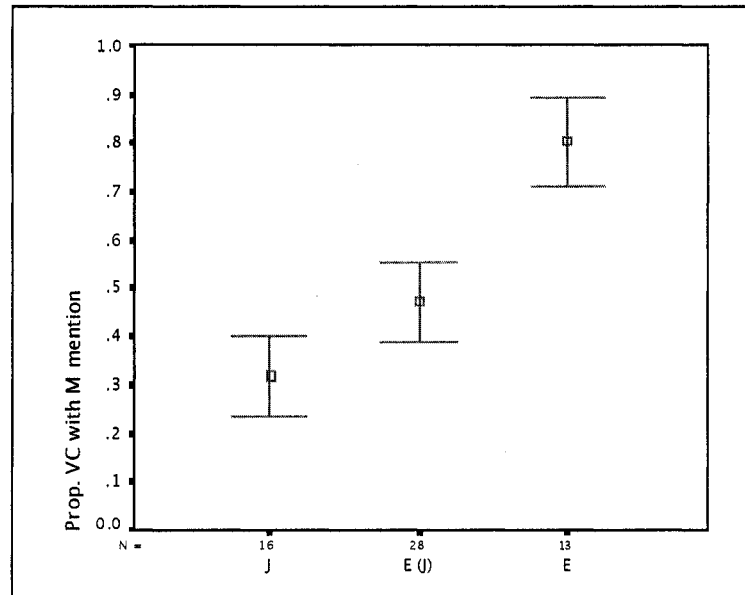


Figure 5.13: Mean proportion of clauses with Manner encoding per total target motion clauses across three groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of clauses encoding Manner per total motion clauses between groups:  $\chi^2 (2, N=57) = 27.119, p < .001$ . Follow-up tests revealed that the combined group of L2 speakers encoded Manner information in a significantly lower proportion of clauses than monolingual English speakers, but significantly more than monolingual speakers of the source language, Japanese.

At the discourse level, the picture was similar. Figure 5.14 shows an error bar plot illustrating the mean proportion of event descriptions encoding Manner per total target event descriptions across L2 and monolingual groups.

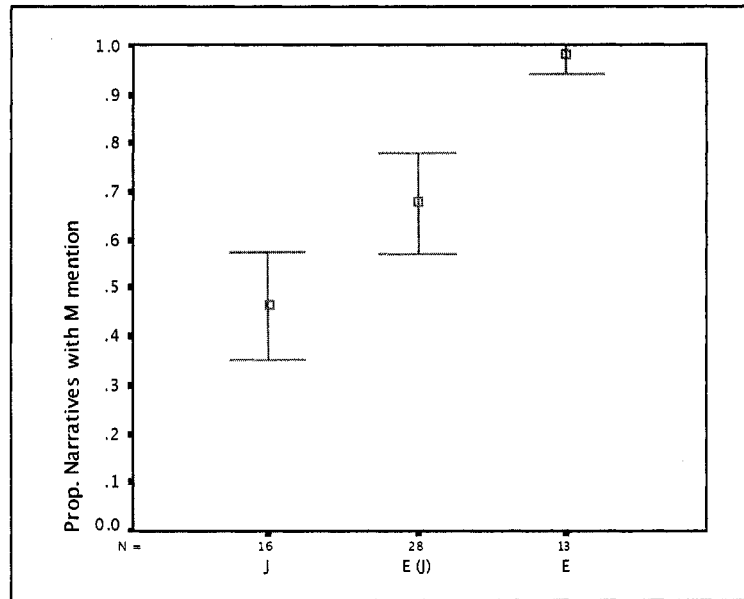


Figure 5.14: Mean proportion of event descriptions encoding Manner per total event descriptions across three groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of clauses encoding Manner per total motion clauses between groups:  $\chi^2(2, N=57) = 24.659, p < .001$ . Follow-up tests revealed that L2 speakers encoded Manner information in a significantly lower proportion of event descriptions than monolingual English speakers, but again significantly more than monolingual speakers of the source language, Japanese.

Unlike previous analyses of Manner expression, in an analysis of the extent to which speakers encoded Manner both at the levels of clause and discourse we see that L2 speakers differed somewhat from the target; however, they also differed from the source. Therefore, despite possible lexical difficulties, L2 speakers encoded Manner to quite a high degree and more so than monolingual speakers of the source language Japanese. This finding is important, albeit perhaps not unexpected, since it is in the

domain of thinking for speaking. We can infer that target-like lexicalization in the L2 is prompting a shift to the target-like rhetorical style of the L2, a rhetorical style that is different from that of the source language.

#### **5.5.4 Expression of Manner in L2 gesture**

Finally, analyses of Manner expression in gesture were conducted to examine the phenomena of Manner fog and Manner downplay. On the basis of previous research in this area with highly proficient Spanish learners of English (Negueruela, Lantolf, Jordan, & Gelabert, 2004), Japanese learners of English were initially predicted to transfer patterns regarding Manner fog from their L1 and gesture about Manner in the absence of Manner information in speech. However, this prediction is in question for two reasons. On the one hand, we have already seen that monolingual speakers of Japanese, unlike monolingual speakers of Spanish, do not actually exhibit gestural Manner fogs to a great degree; therefore, an L1 transfer prediction is somewhat less likely. On the other hand, we have seen that L2 speakers encode Manner in speech significantly less often than monolingual English speakers, potentially as a result of lexical difficulty, which might lead to predictions of increased gestural Manner fog as a compensatory strategy. However, as Gullberg (1998) finds, although second language speakers may use more metaphorical and deictic gestures for organization of discourse, for example, they do not necessarily use more representational gestures such as the gestures to represent motion in this corpus. Therefore, it was not clear what the learners in this study might do with regards to explicit encoding of Manner in gesture.

Table 5.11 shows the mean proportion of gestures expressing Manner when no Manner was present in the accompanying clause out of the total number of motion gestures, as well as the mean proportion of motion gestures expressing only Path when Manner appeared in the accompanying clause out of the total number of motion gestures. All participants gestured for at least one event in their L2, so all are included in these analyses.

Table 5.11: *Mean proportion of motion gestures expressing Manner when no Manner was present in the accompanying clause (Manner fog) per total motion gestures and mean proportion of gestures expressing only Path when Manner appeared in the accompanying clause (Manner downplay) per total motion gesture across L2 and monolingual groups*

	Mono Japanese (J) n=13	L2 Non-mono Japanese Japan (E (J, Japan)) n=15	L2 Non-mono Japanese USA (E (J, USA)) n=13	Mono English (E) n=11
M. fog	.11 (.12)	.06 (.10)	.02 (.03)	0 (0)
M. downplay	.17 (.27)	.29 (.19)	.29 (.26)	.58 (.21)

The Mann-Whitney  $\underline{U}$  test indicated no significant differences between the two sub-groups of non-monolinguals for mean proportion of Manner gestures with no Manner in accompanying clause ( $z = -.838$ ,  $p = .402$ ) or for mean proportion of gestures expressing only Path with Manner in accompanying clause ( $z = -.419$ ,  $p = .675$ ). Thus, these two sub-groups have been collapsed.

Figure 5.15 contains an error bar plot illustrating mean proportion of motion gestures encoding Manner where no Manner information was present in the accompanying clause (Manner fog) out of all motion gestures across the L2 and monolingual groups.

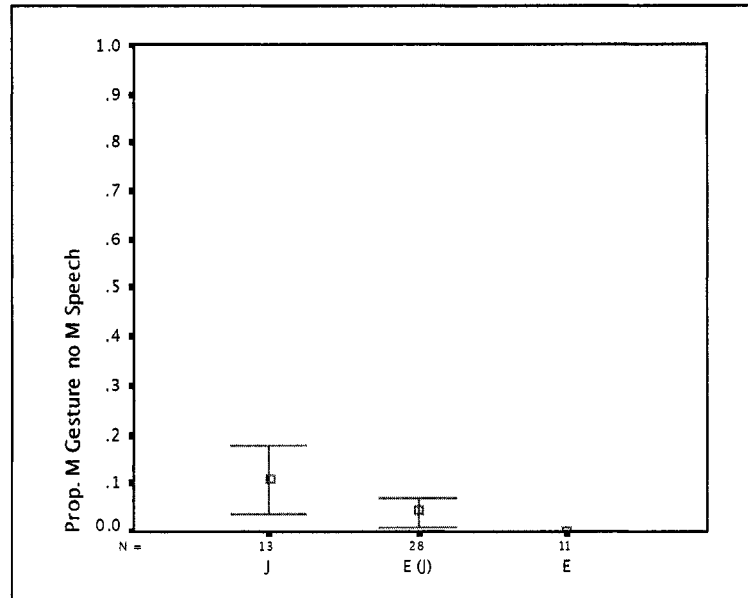


Figure 5.15: Mean proportion of motion gestures expressing Manner with no Manner information in accompanying clause (Manner fog) per total motion gestures across the three groups: J, E (J), and E

L2 speakers differed from the target group (monolingual English speakers), since the latter never exhibited evidence of the Manner fog. A Mann-Whitney test showed a trend that approached statistical significance in mean proportion of gestures expressing Manner with no Manner in the accompanying clause between the combined group of L2 speakers and monolingual Japanese speakers ( $z = -1.876$ ,  $p = .061$ ). However, again the proportions are actually very small.

Finally, Figure 5.16 illustrates with an error bar plot the mean proportion of gestures expressing only Path when Manner was present in the accompanying clause out of all motion gestures across the L2 and monolingual groups.



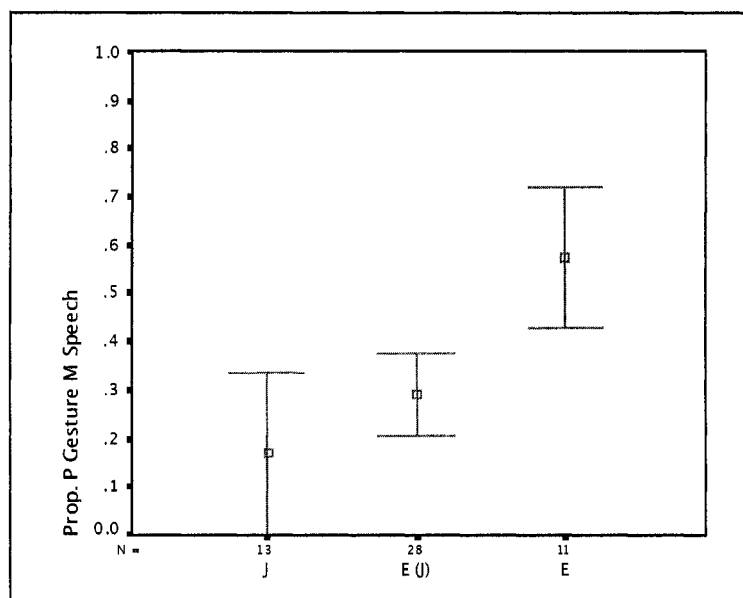


Figure 5.16: Mean proportion of gestures expressing Path alone when Manner was present in accompanying clause out of all motion gestures across three groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of gestures expressing Path alone when Manner was present in the accompanying clause out of all motion gestures between the combined group of L2 speakers, monolingual English speakers and monolingual Japanese speakers:  $\chi^2(2, N=52) = 16.194, p < .001$ . Follow-up tests revealed significant differences between all three groups. L2 speakers produced significantly fewer Path only gestures while talking about Manner in the accompanying clause than monolingual English speakers, but significantly more than monolingual Japanese speakers.

In sum, in line with Gullberg (1998), L2 speakers did not exhibit a high degree of Manner fog, gesturing about Manner instead of talking about it. Since monolingual speakers did not differ that much in the area of Manner fog either, we can draw few conclusions about possible transfer. In contrast, regarding the gestural downplay of Manner information in speech, where there was a clear monolingual baseline difference,

we saw that L2 speakers clearly differed from the target, but in simultaneously differing from the source, L2 speakers demonstrated evidence of learning.

### **5.5.5 Within-subject comparison of expression of Manner in L1 and L2 speech and gesture**

The final set of analyses in this chapter concerns the relationship between L1 and L2 production in speech and gesture of the native Japanese speakers with intermediate knowledge of English. These repeated-measures analyses were conducted using Wilcoxon tests, the results of which are summarized in Table 5.12 below with group means from the preceding analyses repeated for convenience. In no preliminary analysis did the group of non-monolinguals in Japan differ from that in the USA in either their L1 or their L2. They have therefore been combined into one non-monolingual group with a common L1 and L2 score.

Table 5.12: Summary of within-subject L1 and L2 production in all speech and gesture analyses

Analysis	Non-mono L1	Non-mono L2	Result
Lexical inventory of M expression	Verbs and adverbials	Mostly verbs	Difference
Lexicalization of M in verb	.77 (.34)	.98 (.10)	Significant difference: $z = -2.989$ , $p = .003$
Lexicalization of M in mimetic	.21 (.31)	0 (0)	Significant difference <sup>9</sup>
Lexicalization of M in comparison phrases	.20 (.26)	.07 (.12)	Significant difference: $z = -2.266$ , $p = .023$
Concatenation of M expression within clause	1.17 (.26)	1.05 (.13)	Non-significant difference: $z = -1.767$ , $p = .077$
Encoding of M in clause	.36 (.22)	.47 (.22)	Non-significant difference: $z = -1.857$ , $p = .063$
Encoding of M in description	.58 (.25)	.68 (.27)	Non-significant difference: $z = -1.650$ , $p = .099$
Manner fog in gesture	.05 (.10)	.04 (.08)	Non-significant difference: $z = -.773$ , $p = .440$
Manner downplay in gesture	.37 (.34)	.29 (.22)	Non-significant difference: $z = -.020$ , $p = .984$

The results summarized above are both predictable and surprising at the same time. Given that these individuals are speaking completely different languages, L1 Japanese and L2 English, we would expect them to vary along at least some parameters. The parameters with maximal contrast are the very ones that are most basic to the typology of each language, i.e. lexicalization patterns. Thus, when performing in their L1, Japanese speakers with knowledge of English lexicalize Manner in ways roughly distributionally similar to monolingual speakers of Japanese, i.e. with verbs, mimetics and adverbial comparisons. When performing in their L2, they switch to the distributional patterns that characterize monolingual English speakers, i.e. predominant use of verbs. Given that each language offers slightly different options for lexicalization

<sup>9</sup> No test was conducted here since there is a 0.

(i.e. the existence of mimetics in Japanese, but not in English), such behavior is rather unsurprising. Although for L2 learners at an intermediate level, such patterns constitute evidence for learning.

What is quite remarkable, however, is the degree of similarity between L1 and L2 production in domains affected by typological differences in lexicalization, such as information structure. Regarding encoding of Manner in speech and in gesture, areas where the monolingual baseline is often robustly different, non-monolingual Japanese occupy a middle ground in both their L1 and their L2. From a global perspective, they encode Manner in speech more often in their L1 and L2 than monolingual speakers of Japanese, albeit less often than monolingual speakers of English. In parallel, when non-monolingual speakers encode Manner in speech, they are less likely to accompany their descriptions with gestures encoding Manner in their L1 and L2 than monolingual speakers of Japanese, but exhibit greater semantic overlap than monolingual English speakers. To conclude this section, it appears that for much of the domain of expression of Manner, differences lie between subjects, i.e. monolinguals and non-monolinguals, rather than within subjects, i.e. non-monolinguals in their L1 and their L2.

### 5.5.6 Summary of main findings in expression of Manner

Table 5.13 summarizes all main findings from this chapter.

Table 5.13: *Summary of main findings in expression of Manner*

Analyses	Findings
Lexicalization of Manner	Partially in line with predictions, monolingual speakers of English and non-monolingual Japanese speakers in L2 English lexicalized Manner in verbs, although the range was rather narrow. Japanese speakers, monolingual and non-monolinguals in L1, lexicalized Manner in verbs and adverbials, with a surprisingly wide range of lexical types.
Concatenation of M expression within clause	Generally in line with predictions, monolingual Japanese concatenated slightly more Manner expressions within the clause than English speakers, both L2 and monolinguals.
Encoding of M in speech	Generally in line with predictions, monolingual English speakers encoded Manner more often than non-monolingual speakers of Japanese in L1 and L2 at the clause and discourse levels. Non-monolingual speakers of Japanese in L2 English encoded Manner more often than monolingual Japanese speakers at the clause and discourse levels.
Manner fog in gesture	Generally in line with predictions, monolingual speakers of Japanese and non-monolingual speakers of Japanese in L1 and L2 exhibited some 'Manner fog' in gesture, encoding Manner in gesture when only Path was encoded in speech. Monolingual English speakers did not exhibit this pattern.
Manner downplay in gesture	Fully in line with predictions, monolingual speakers of English exhibited 'Manner downplay' in gesture, encoding only Path in gesture when Manner was encoded in speech, more often than other groups. Non-monolingual speakers of Japanese in L1 and L2 exhibited 'Manner downplay' in gesture more often than monolingual Japanese speakers.

## **5.6 Discussion**

This study investigated spoken and gestured expression of Manner in monolingual and non-monolingual discourse. Questions addressed were (1) how speakers lexicalized Manner, (2) whether speakers concatenated Manner expressions within the clause, (3) to what extent speakers explicitly encoded Manner in speech, and (4) to what extent speakers explicitly encoded Manner in gesture. In order for non-monolingual results to be fully interpretable, the picture from monolingual speakers must be sufficiently clear; these will therefore be discussed first.

### **5.6.1 Monolingual expression of Manner**

A monolingual baseline difference was found for all areas of expression of Manner. Monolingual English speakers encoded Manner more often in the verb, had a smaller repertoire of Manner verbs and a smaller inventory of Manner expressions overall with very few adverbials and no onomatopoeics, concatenated few Manner expressions within the clause, explicitly encoded Manner more often both in clauses and descriptions, and exhibited less of an overlap between Manner speech and accompanying gesture.

The majority of results for monolingual English narratives were predicted on the basis of previous research. Consistent with the findings of extensive studies on English, the monolingual English speakers in this study had a sufficient number of Manner verbs readily available to fill main verb slots, which they deployed with great frequency in their descriptions of motion events both at the level of the clause and at the level of

discourse. With Manner so ubiquitous in their descriptions, monolingual English speakers appeared to ‘background’ its significance by not gesturing about it, while gesturing about other aspects of the motion event, i.e. Path.

Analyses of spontaneous monolingual Japanese narratives were a little more exploratory and yielded results broadly in line with studies on other verb-framed languages, but at the same time rather distinct. Resembling other verb-framed languages, monolingual Japanese speakers frequently lexicalized Manner in the verb. However, they also employed a variety of adverbials, primarily mimetics and comparison phrases to some degree. Furthermore, the existence of verb compounding enabled Manner semantics to partially occupy the main verb slot, a phenomenon somewhat rare in comparison to typologically “similar” languages. This led to elaboration of Manner within the clause in a process of concatenation of Manner expression, which might not be observed in other verb-framed languages.

From a Slobinian perspective, it might well be the various lexical features of the language that led to the rather surprising variety of lexical types, both verb and adverb, exhibited by speakers in spontaneous production, a finding consistent with research on literary translations (Ohara, 2004; Sugiyama, 2005). In other words, if speakers of even verb-framed languages can express Manner in frequent, monomorphemic lexical items, which can additionally take pride of place in the main verb, they deserve as rich a lexical inventory as speakers of satellite-framed languages. However, a Slobinian account would only really make sense if monolingual Japanese and English speakers produced comparable numbers of lexical types, and this was not the case. Whereas

monolingual English speakers converged on a limited set of lexical items to depict *climbing*, *rolling* and *swinging*, monolingual Japanese speakers appeared to diverge, resulting in a greater assortment of items.

Hence, an alternative explanation for the monolingual Japanese repertoire of Manner expression warrants consideration. As noted by Kita and Özyürek (2003), when describing Rope Swing, Japanese speakers faced a lexical gap with no equivalent verb for the English verb *swing* to encode a self-agentive, single arc-shaped movement from one location to another. Verbs used to describe the action of a child in a playground, e.g. *yureru* 'swing', would not suffice, since they emphasize the repeated back and forth nature of an arc-trajectory movement and would not accurately describe the movement undertaken by Sylvester in order to reach Tweety's window. Faced with such a lexical gap, one might expect speakers to experiment with different expressions in order to convey their meaning. And indeed, that is to some extent what we see. For this event alone, Japanese speakers, both monolingual and non-monolingual, used a total of 14 lexical types in their descriptions, e.g. *janpu* 'jump', *syuu* 'Mimetic: whizz', *furiko-no-youni* 'resemble a pendulum', *taazan mitaini* 'like Tarzan', versus 6 types used in descriptions of Bowling Climb and only 3 in Drainpipe Climb. In order to support this argument, it would be useful to test another verb-framed language in the context of a lexical gap to see what creative things speakers would spontaneously come up with to describe a Manner for which they had no readily available word. However, another event, Bowling Roll, also elicited a high degree of variety in Manner expression: 11



lexical types. Therefore, a lexical gap cannot be the only explanation for the great variety of lexical types used to express Manner by monolingual Japanese speakers.

Perhaps an explanation lies in differing consistencies of different morphosyntactic resources. In other words, when using verbs, speakers might converge to a greater extent than when using adverbials. Indeed, even Japanese speakers largely converged on the array of verb types. If adverbials are inherently more variable, then use by Japanese speakers led to a wider range of lexical types. More research is needed on this issue to test whether convergence between speakers is a function of word class.

A second way in which monolingual Japanese speakers, at least superficially, resembled speakers of other verb-framed languages was in the absence of explicit encoding of Manner in speech at the level of the clause, and even at the level of discourse. Albeit potentially expected, together with the results on lexical inventory, this was a slightly surprising result, i.e. if they had so many lexical resources at their disposal, why were they not used all the time? There are two possible explanations for this. The first possible explanation relates to the lexical gap issue. Within Slobin's framework, if a self-agentive, single arc-shaped movement were not easily 'codable' in a language, it would be more costly in terms of 'processability' and would therefore be less likely to be explicitly mentioned in discourse. However, given that 73% of Japanese monolinguals talked about Manner in descriptions of Rope Swing and 75% talked about Manner for Bowling Roll, the lexical gap involved in Rope Swing did not seem to be a major obstacle.

The second more plausible explanation for overall less explicit encoding of Manner in monolingual Japanese discourse pertains to the climbing events, which were conspicuously lacking in Manner information: 23% of descriptions of Drainpipe Climb included mention of Manner, and only 13% of descriptions of Bowling Climb. In these narratives, the verb *noboru* ‘climb/ascend’ was common. As discussed in Appendix III, the status in the literature of *noboru* as a simple Path verb is a little problematic, and there may be inherent Manner semantics. In reality, speakers may have intended to convey Manner with the use of such a verb, but may not have been credited for that in what is essentially an artifact of the coding scheme. The slight difference between the two climbing events might be explained by the fact that when describing Drainpipe Climb, where speakers could clearly see Sylvester’s use of hands and feet, as it were, they were more apt to use the compound verb *yoji-noboru* ‘clamber-climb/ascend’. When describing Bowling Climb, where the ascent was inside the pipe such that use of limbs could not be seen, speakers were more like to use the plain *noboru*. The significant monolingual baseline difference in explicit encoding of Manner should therefore be treated with some caution.

Finally, monolingual Japanese speakers behaved much less like the native Spanish speakers reported in other studies in that, although there was a suggestion of the existence of a “Manner Fog”, this was not a robust finding and certainly there was no indication that such a pattern would be the preferred one among monolingual Japanese speakers. Moreover, given that figures for explicit encoding of Manner may have been *underestimated* due to the coding of *noboru*, the possible trend for gestural

marking of Manner in its absence in the accompanying clause may actually be overstating the case. On the other hand, monolingual Japanese speakers do differ quite significantly from monolingual English speakers in this domain in that they appear to exhibit greater semantic overlap between speech and gesture (i.e. marking Manner in both modalities), although of course coding of *noboru* as a Path verb could also be contributing to this effect.

Despite the caution with which monolingual results above have been interpreted, it is fair to say that there are sufficient grounds for claiming a crosslinguistic monolingual baseline difference in expression of Manner. We move, then, to the main theme of this dissertation, how such crosslinguistic differences affect the L1 of individuals who are learning a second language that is typologically different from their first.

### **5.6.2 Effects of the L2 on the L1 in expression of Manner**

In an investigation of possible influence of a second language on a first, the crucial comparison is the *intra*-language one, holding other factors constant, between a monolingual L1 and a non-monolingual L1. Areas in which these systems show contrast can be taken as evidence to suggest alteration of the L1 system potentially as a result of acquisition of a second language. And in cases where a divergent L1 pattern actually begins to resemble a pattern exhibited by monolingual speakers of the L2, we may have stronger evidence to suggest influence of an L2 on an L1.

In expression of Manner, the L1 of Japanese speakers with knowledge of English differed from the monolingual L1 in several areas. Regarding lexicalization, although not statistically significant and not the preference for lexicalization in either group, there may be a trend for non-monolinguals to lexicalize Manner in mimetic adverbials and comparison adverbials, whereas monolinguals seemed to prefer mimetics. This trend, if genuine, is a slightly puzzling one, since superficially it does not appear to stem from robust patterns in English, i.e. no significant number of adverbial comparison phrases. On the other hand, although comparison phrases are certainly not common in monolingual English discourse, they are not completely absent, unlike novel onomatopoeics. So in a way, the non-monolingual Japanese pattern more closely resembled that of monolingual English speakers than the monolingual Japanese pattern did. If the L1 lexical system of a non-monolingual is subtly affected by knowledge of English, but this interaction does not lead to greater use of verbs since there is a finite collection of these in the speaker's L1, the interaction may manifest itself in greater use of the adverbial system allowed by the L2, in this case comparison phrases. Taken alone, this is not strong evidence for the existence of influence of an L2 on an L1 and more research is necessary on this issue, but it is suggestive of such a scenario.

Secondly, regarding explicit encoding of Manner, patterns are similar to those for lexicalization. Again, there were no statistically significant intra-language differences in monolingual and non-monolingual Japanese production, but certain

trends may be present<sup>10</sup>. Thus, native speakers of Japanese with knowledge of English appeared to encode Manner explicitly slightly more often in the clause and in the event description than their monolingual Japanese counterparts, a pattern which more closely resembled that of monolingual English speakers. This finding somewhat contradicts Hohenstein, Eisenberg and Naigles (2006), who did not find L2 influence on L1 in this domain, i.e. increased propensity to mention Manner in the L1 (Spanish) of Spanish-English bilinguals. However, numerous methodological differences between the studies such as language pairing, data elicitation procedure and L2 proficiency may account for the disparity.<sup>11</sup> If the trend here is genuine and there is truth to Slobin's concept of 'thinking for speaking', such a pattern has implications for linguistic cognition. In other words, if Japanese learners of English begin to encode Manner more explicitly in their L1 after exposure to their L2, over time they may begin to perceive and conceptualize motion differently from monolingual speakers of Japanese.

Finally, results concerning semantic overlap between speech and gesture are the most interesting of all.<sup>12</sup> The existence of a gestural "Manner fog" in monolingual Japanese discourse is far from empirically compelling, but it is even less compelling for non-monolingual Japanese discourse, a pattern reminiscent of that in monolingual English discourse. Moreover, in the process of 'backgrounding' Manner information in speech by gesturing only about Path, we do see a statistically significant difference

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<sup>10</sup> These trends are unaffected by the coding of *noboru* because it was treated identically in monolingual Japanese and non-monolingual Japanese coding.

<sup>11</sup> Unfortunately, while the Hohenstein et al. study contrasts early and late bilinguals in a novel way, there is no objective measure of proficiency with which to compare participants between studies.

<sup>12</sup> Here again, intra-language Japanese differences should not be affected by the treatment of *noboru*.

between monolingual speakers of Japanese and those who know English. This finding is highly suggestive of influence of the L2 on the L1. Although non-monolingual Japanese in their L1 also significantly differed from monolingual English speakers, they occupy the middle ground between both groups of monolinguals. Thus, we may conceive of a non-monolingual L1 system in the process of becoming habituated to the concept of Manner existing as an inherent part of motion as a result of exposure to an L2 that operates in this way.

### **5.6.3 Effects of the L1 on the L2 in expression of Manner**

The final piece of the picture is the performance of non-monolinguals in their L2. Traditional analyses are conducted in much the same way as the preceding ones, with an intra-language comparison, assessing L2 production in light of the 'target'. Again, areas of contrast, specifically those where performance in the L2 resembles that of the L1 are typically considered evidence of influence of an L1 on an L2. Previous work on expression of Manner actually showed somewhat contradictory patterns, with evidence of L1 transfer at the lexico-syntactic interface, e.g. subcategorization frames (Montrul, 2001), but perhaps not at the purely lexical level (Cadierno & Ruiz, 2006).

From the analyses presented here, in their L2 English, native Japanese speakers looked rather target-like at the lexical level in terms of lexicalization patterns and lexical inventory, a finding consistent with previous research. However, they differed from monolingual speakers of English with less explicit encoding of Manner in speech,

although with generally more explicit encoding than monolingual Japanese speakers.<sup>13</sup> It is impossible to discern whether this resulted from constraints on the L2 lexicon or transfer from the L1. Finally, in terms of semantic overlap between speech and gesture, their performance was once again between that of both groups of monolinguals - a pattern very familiar in studies of second language acquisition generally - which suggests a certain degree of transfer from the source language, i.e. marking of Manner in gesture and in speech, but which also approximates the target language, i.e. a certain degree of downplaying of Manner information using gesture.

We conclude with the within-subject comparison, i.e. the performance of the native Japanese learners of English in their L1 and L2. Since these individuals were speaking two different languages, one would have expected differences, and for those differences to be in areas such as the lexicon. And of course, this is what we see. In their L1, native Japanese learners of English lexicalized Manner in verbs and adverbials, whereas verbs dominated in the L2. However, the most striking findings from this comparison were the similarities in L1 and L2 production in the areas of encoding of Manner in speech and gesture. Perhaps it is in this final arena, an arena on the periphery of typological patterning, that all other intra-language differences accumulate, giving rise to what we may observe as a merger between the L1 and the L2.

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<sup>13</sup> This is not to suggest that with the exception of explicitness in Manner encoding, learners were wholly target-like in every other domain. Of course, there were many errors in L2 production, e.g. in use of tense and other areas of the grammar, but these are not relevant for the discussion here.

## 5.7 Conclusion

Within the broad goal of this dissertation of identifying and subsequently characterizing the interaction between language systems in the multilingual mind, this study examined expression of Manner in elicited narratives from monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English. Although at an intermediate level of proficiency in the L2, we might have expected patterns particularly supporting claims of effects of an L2 on an L1 to be extremely subtle, several robust patterns suggested influence of the L1 on the L2, the traditional line of enquiry, but also influence of the L2 on the L1, a more novel finding. In certain areas, for example, marking of Manner in gesture, production in the L1 and L2 of a non-monolingual looked more similar than production in the L1s of monolingual speakers of different languages. Furthermore, trends in other areas, for example encoding of Manner in discourse, while somewhat impressionistic and descriptive, also pointed in the general direction of bidirectional crosslinguistic influence.

As in Chapter 4, we should be somewhat tentative in our conclusions. It is not clear whether new distributions in non-monolingual discourse really provide evidence of crosslinguistic influence between the specific linguistic systems under investigation here or whether they are indicative of more universal developmental patterns. However, the findings presented in this chapter do go some way towards showing that there is potential for interactions between languages in the multilingual mind. We now turn to the final empirical study in order to add weight to our thesis.



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## **Chapter 6: Combination of Manner and Path in Monolingual and Non-monolingual Speech and Gesture**

### **6.1 Introduction**

We have seen in the preceding two chapters how Path and Manner are typically lexicalized by monolingual speakers of English and Japanese and the variety of crosslinguistic differences that arise as a result of these lexicalization patterns. However, in reality, Path and Manner are not completely independent of each other; they are two aspects of the same concept – motion – and as such, expression of one will influence expression of the other. The current chapter, therefore, deals with this interdependence. Given the existence of crosslinguistic differences in the expression of Path and Manner alone, we look at consequences for combinations of Manner and Path in speech and gesture. Once again, if typological differences can be expected in monolingual production, this domain can be exploited in order to detect crosslinguistic influences in multilingual language production.

This study investigates how Path and Manner are expressed in combination in elicited narratives from monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in L1 and L2. We investigate how monolingual speakers of each language distribute both Path and Manner within and across verb clauses in descriptions of a given motion event and/or particular parts of a motion event, whether both components are explicitly encoded by all speakers, how such information is encoded in co-speech representational gestures,

and whether non-monolingual speakers in L1 and L2 differ from the monolingual baseline in these areas. We begin by outlining what previous research tells us about the combinations of Path and Manner crosslinguistically and in second language acquisition, followed by what predictions might come out of these findings for both monolingual and non-monolingual language production. We then describe the methodology specific to this study, including details of speech and gesture coding. Finally, we present our results, interpreting them with respect to what can be concluded about the interaction between language systems in the multilingual mind.

## **6.2 Background**

### **6.2.1 Combined expression of Manner and Path from a typological perspective**

Talmy's (1985; 1991; 2000) original typology describes differential lexicalization patterns for expression of Manner and Path according to typology-specific preferences. The existence of these differences for expression of Manner and Path alone predicts the existence of differential syntactic constructions for combined expression of Manner and Path. More specifically, satellite-framed languages are predicted to package Manner and Path in a single verb clause, with Manner in the main verb and Path in an accompanying satellite, as shown in the English example in (1). Verb-framed languages, on the other hand, are predicted primarily to distribute the same semantic information over two verb clauses, with Path in the main verb and

Manner in a subordinated verb as shown in (2), or to some extent in a single clause with Path in the main verb and with Manner as an adverbial as illustrated in (3).<sup>1</sup>

(1) [*The ball rolls down*]

(2) [*Booru-ga mawari-nagara oriru*]

ball-Nom rotate-while descend

Lit: 'While the ball rotates, it descends'

(3) [*Booru-ga korogatte iku*]

ball-Nom roll.Con go

Lit: 'The ball goes rolling.'

These predictions have been supported empirically by Allen, Özyürek, Kita, Brown, Furman, Ishizuka & Fujii (2006), who showed very clear differences in use of mono- versus multi-clause sentences in English, Turkish and Japanese. Thus, when talking about Manner and Path, English-speaking adults almost always used mono-clause sentences of the type in (1). In contrast, Turkish- and Japanese-speaking adults almost always used multi-clause sentences of the type in (2).

### 6.2.2 Extension of the typology for combined expression of Manner and Path

While the above examples are the most prototypical exemplars of typological framing, alternative constructions are both available and used by speakers of both satellite- and verb-framed languages. English has the mono-clausal equivalent of (3),

<sup>1</sup> Example (3), a complex motion predicate in Japanese as defined by Matsumoto (1991; 1996), is roughly equivalent in structure to the often-cited example in Spanish, *La botella entró a la cueva flotando* 'The bottle entered the cave floating' (Talmy, 1985:69), although with some additional restrictions (see Chapter 3).

i.e. Path in the main verb slot and Manner in a progressive participle functioning as an adverbial, as shown in (4) below. In addition, taking into consideration directional prepositions coded as Path here, English speakers can produce clauses such as (5).<sup>2</sup> Furthermore, Kita, Özyürek, Allen, Brown, Furman and Ishizuka (under review) found that English speakers are sensitive to the causal relationship between Manner and Path (cf. Goldberg, 1997) and will adjust clause type accordingly. Thus, contexts such as that expressed in (1), where Manner is inherent to Path, i.e. Manner causes the change in location, will elicit canonical mono-clausal constructions. In contrast, contexts such as that demonstrated in (6), where Manner is more incidental to the Path, will elicit bi-clausal constructions.

(4) [The ball goes down rolling]

(5) [The ball rolls to the bottom]

(6) [The ball twirls] [as it goes down]

As far as verb-framed languages are concerned, alternatives to the structures exemplified in (2) and (3) have primarily been investigated for Spanish. Aske (1989) initially contested Talmy's notion that in order for Spanish to include both Manner and Path within a single verb clause, a complex, and sometimes lengthy, two-verb construction would be needed. Aske introduced telicity as a factor to explain the somewhat mixed typological features found in Spanish, i.e. the existence of numerous colloquial constructions in which Manner appeared as a main verb and Path appeared outside the verb in a complement phrase. He accounted for Spanish constructions

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<sup>2</sup> See Chapter 4 for a discussion of directional adpositions coded as Path in English and Japanese.

seemingly violating Talmy's typology, as in (7), with the use of a Manner verb plus a locative expression, by proposing that descriptions of motion events taking place in a single location allowed verb patterns much like English.

(7) *Juan bailó en círculos/de un lado para otro/hacia la puerta/hasta la puerta*

'Juan danced in circles/from one place to other/towards the door/to the door'

(Aske, 1989:3)

However, telic motion events, with Path bounded at one end, cannot enter into the same construction, as shown in (8) but force the typologically consistent pattern as in (9).

(8) \**Juan caminó hasta la cima en dos horas*

'Juan walked up to the top in two hours'

(Aske, 1989:7)

(9) *Juan fue al cima en dos horas caminando*

'Juan walked up to the top in two hours'

Slobin and Hoiting (1994) expanded on Aske's modification by presenting state changing boundary crossings as events impacting typology. Noting that in some cases even telic events allow typological violations in Spanish, they argued that the crossing of a boundary, such as entering or exiting, was perceived as a change of state in Spanish and thus mandated typologically consistent verb patterns with independent verb predicates. In (10), with no crossing of a boundary, a Spanish speaker can use a Motion + Manner verb with both Path and Ground elements appearing within the same verb clause.

(10) *Empezó a correr hacia el barrano*

‘He started to run towards the cliff’

(Slobin & Hoiting, 1994:494)

However, in (11), where there is crossing of a boundary with a corresponding change of state, Spanish is forced to use a Path verb and would likely omit the Manner *stomp*.

(11) *He stomped from the trim house*

*Salió de la pulcra casa*

‘He exited from the trim house’

(Michener 1978/1980 cited in Slobin, 1996b:212)

A later study by Naigles, Eisenberg, Kako, Highter and McGraw (1998) produced a mixed picture. In Spanish descriptions of static pictures, they found no evidence for the importance of boundary crossing as hypothesized by Slobin and Hoiting (1994). Because this could have been an artifact of the stimuli, they also tested descriptions of dynamic video stimuli. Here they found a greater number of typologically consistent structures with main Path verbs used for the crossing of horizontal boundaries, e.g. entering a building. However, for the crossing of vertical boundaries, e.g. sliding into the pool, more Manner verbs were elicited, contrary to typological predictions. These results, which further constrain Slobin and Hoiting’s initial hypothesis, were explained by the degree of ‘exertion’ required, i.e. that a vertical boundary crossing arising from an initial exertion by the agent, for example,



pushing off the side of the pool, is not lexically constrained in the same way that other boundary crossings are.

In an additional modification of the original typology, Özçaliskan and Slobin (2000) looked at inter-lingual differences between English and Turkish narratives. Their claim was that "speakers are driven by economy constraints to make use of the simplest form that will convey the necessary information. In some instances, availability of a simple form may allow a speaker to override general typological patterns of expression." (Özçaliskan & Slobin, 2000:559) Their focus was the matrix-subordinate Path-Manner construction *tirmanarak çık* 'ascend climbing' versus the single verb in Turkish, *tirman* 'climb up,' which conflates Manner and Path information. The first of these conforms to typological constraints, but is syntactically more complex. The second violates typological constraints, but is syntactically simpler. They hypothesized that given a choice of constructions, Turkish speakers would opt for the syntactically simple one even at the expense of typological preferences, a prediction borne out by their data.

The more fine-grained specifications added to Talmy's original characterization of verb-framed languages outlined above can generally be applied to Japanese with some additional commentary. Although we know of no work done on boundary crossing in Japanese, Tsujimura (1994, cited in Inagaki, 2002b) has invoked the notion

of telicity to explain why a Manner verb may not appear in the same clause as the directional particles *ni* or *e* (to) as exhibited in (12).<sup>3</sup>

(12) \**John-ga gakkoo-ni/e hashitta/aruita*

John-Nom school -to/to ran/walked

‘John walked/ran to school’

(1994, cited in Inagaki, 2002b:119)

However, Inagaki (2002b) noted that telicity cannot explain why the following utterance with *made* ‘up to’, which also contains telic Path, is possible in Japanese. (See also Ikegami, 1981, and Yoneyama, 1986, cited in Inagaki, 2002, for additional commentary on *made*.)

(13) *John-ga gakkoo-made hashitta/aruita*

John-Nom school-up.to ran/walked

“John walked/ran up to school”

(Inagaki, 2002b:191)

Instead, Inagaki offered a complex lexico-syntactic account of this phenomenon. He proposed that Japanese *made*, like English *to*, is a directional adposition that refers to route of the trajectory. Conversely, *ni/e*, which appear equivalent to English *to*, actually differ in that they only encode location, referring to the endpoint of a trajectory, and

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<sup>3</sup> See Inagaki (2002b: 191, footnote 11) for comments on variations in native speaker judgments of sentences such as (12). Moreover, Japanese speakers seem to agree that the case of the Manner verb *korogaru* ‘roll’ is somehow special and they will allow sentences such as ‘*shita-ni korogaru*’ ‘roll to the downness / roll down’, albeit with a less telic interpretation than is usually ascribed to *ni* ‘to’.

lack the predicative force of directional adpositions to license a Manner verb in the same relational structure.<sup>4</sup>

Moreover, Japanese possesses additional resources to package Manner and Path in the same verb clause not discussed in research on Spanish. These include verb compounds, somewhat analogous to Manner-Path conflated verbs such as *tirman* ‘climb up’ in Turkish (Özçaliskan & Slobin, 2000). Indeed, Ohara (2004) argues that in Japanese translations of literary texts, verb compounding, as illustrated in (14), is actually a very frequent construction employed to express Manner and Path (seen in 33 cases out of 82 in her corpus). In addition, with the existence of Manner mimetics shown in (15), Japanese speakers have an alternative mono-clausal option.

(14) [*Booru-ga koroge-ochiru*]

ball-Nom roll-drop

Lit: ‘The ball rolls descends’

(15) [*Booru-ga korokoro-to iku*]

ball-Nom Mimetic-Comp go

Lit: ‘The ball goes ROLL ROLL’

Despite the variety of fully grammatical ways in which Manner and Path *can* be expressed in both English and Japanese, Talmy’s typological framework still predicts crosslinguistic differences in *preferences* for particular constructions, such as those illustrated in examples (1) – (3). These preferences have been found to be robust in English and Japanese, although the extent to which other structures are also used is an

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<sup>4</sup> Despite this analysis, *ni/e* ‘to’ have been coded as directional Path components here.

area of some debate, i.e. evidence of very little use of alternative structures (cf. Allen et al., 2006) versus evidence of rather more use of alternative structures (cf. Ohara, 2004). It is not fully clear what governs usage of mono-clausal Manner-Path constructions in Japanese, for example, but possible that stimulus materials and discourse type play a role. However, agreement on the existence of preferences at least has implications for the linguistic system, and these are discussed next.

### **6.2.3 Consequences of combined expression of Manner and Path**

#### **6.2.3.1 Encoding of Manner and Path in discourse**

The ways in which Manner and Path are expressed together in both satellite- and verb-framed languages have implications for semantic explicitness. Satellite-framed languages such as English are generally considered quite efficient in their encoding of motion. Since tight and relatively simple packaging of Manner and Path in single verb clauses is available, it is assumed that English speakers will encode both components in their descriptions of motion events. Certainly, we can infer from the results in Chapters 4 and 5 that English speakers do typically talk about both aspects of the event.

On the other hand, speakers of verb-framed languages have been predicted likely to omit an element because such tight syntactic structures may be less available or less characteristic of the language (cf. Slobin, 1996b, *inter al.*; Talmy, 1985; Talmy, 1991), or even completely ungrammatical, particularly in cases of telic, horizontal boundary crossing (cf. Aske, 1989; Naigles et al., 1998; Slobin & Hoiting, 1994).

Indeed, results from the preceding chapters show that Japanese speakers generally talk about Path overtly, but may exhibit less overt expression of Manner. We may infer, then, that there may be crosslinguistic differences in encoding of both components.

However, in testing this exact hypothesis, Allen et al. (2006) found no crosslinguistic differences in encoding of both Manner and Path in the narratives of adult English, Turkish and Japanese speakers. This apparent contradiction can probably be explained by stimulus materials and/or discourse type. Previous work suggesting less encoding of Manner and Path in verb-framed languages is based on literary texts and extended narratives elicited from relatively common picture and animated stories. Arguing that, particularly in the latter case, Manner might not have been a salient feature of motion and that this resulted in less encoding, Allen et al. (2006) employed a different stimulus material. Short animated vignettes with salient Manner and Path were used to elicit short narrative descriptions. Given this context, crosslinguistic differences in encoding of Manner and Path seem to disappear.

### **6.2.3.2 Expression of Manner and Path in gesture**

Consequences of typological differences in combining Manner and Path can also be seen in co-speech representational gesture. In their narrative studies of motion events using the same stimulus material as employed here with native Turkish-, Japanese- and English-speaking participants, Kita and Özyürek (2003) demonstrated that the nature of semantic and syntactic packaging in speech in each language influences and shapes gesture packaging. They argued that English speakers, with the

resources to package Manner and Path in the same verb clause, were more likely to use gestures that also packaged the elements together in one fluid motion. Although there were gestures encoding Path or Manner alone, these were in the minority. Japanese and Turkish speakers, on the other hand, whose languages do not typically allow such within-clause packaging, also produced simultaneous Manner-Path gestures, but were more likely than English speakers to produce additional gestures separating out the semantic components of Manner and Path into two or more different gestural representations.

Focusing on descriptions of the same Bowling Roll and Rope Swing events that comprise part of the stimulus set included in this study, Kita and Özyürek commented on another interesting finding concerning the perspective from which the gesture was deployed. Perspective was operationalized as the direction in which the gesture was produced. From an “event-internal” perspective, they argued, “the protagonist’s body is mapped onto the speaker’s body and the motion in the stimulus is expressed as a movement away from the body in gesture” (Kita & Özyürek, 2003:21). From an “event-external” perspective, “the viewer’s body is mapped onto the speaker’s body and the lateral motion in the stimulus ... is expressed as a lateral movement in gesture.” (Kita & Özyürek, 2003:21) Their results showed event-external perspective to be the most common in all language groups, and that the direction encoded in gesture, which was never encoded in speech, mirrored that exhibited in the stimulus. This outcome supported their argument for an “Interface Model” of speech and gesture production, in which gestures can encode information not present in the accompanying speech.

However, most relevant for the study presented here is the observation that there may a slight crosslinguistic difference in the frequency with which “event-internal” perspective characterizes the execution of a gesture. More specifically, they remarked that, particularly for the Bowling Roll event, Turkish speakers produced gestures from an event-internal perspective, whereas English and Japanese speakers did not. Table 6.1 summarizes their findings.

Table 6.1: *Summary of Kita and Özyürek’s (2003) findings on percentage of “event-internal” perspective out of all motion gestures produced by English-, Japanese-, and Turkish-speaking participants in descriptions of Bowling Roll and Rope Swing events<sup>5</sup>*

	Bowling Roll event	Rope Swing event	<b>Average % event-internal gestures</b>
English speakers	4%	24%	<b>14%</b>
Japanese speakers	0%	28.5%	<b>14%</b>
Turkish speakers	28.5%	27.5%	<b>28%</b>

From the last column in Table 6.1, it does indeed appear as if Turkish speakers are twice as likely to produce gestures from an event-internal perspective (collapsing Kita and Özyürek’s results on gestures with different semantics employed in descriptions of different events) than either English or Japanese speakers. Kita and Özyürek suggest further research to investigate this issue. However, it is also interesting that both English and Japanese speakers treat the two events differently, producing more event-internal gestures in descriptions of Rope Swing than Bowling Roll. The existence of this phenomenon as well as possible explanations for it are not mentioned by the authors.

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<sup>5</sup> Manner-Path conflated gestures here include the “arc gestures” coded by Kita and Özyürek for the Rope Swing event.

There are alternative studies, however, which can be brought to bear on the issue of intra-language variation in gesture perspective. McNeill (1992) uses the following terminology: Character Viewpoint (C-VPT) for event-internal perspective and Observer Viewpoint (O-VPT) for event-external perspective. This classification is broader than that used by Kita and Özyürek, comprising features such as hand-shape in addition to direction. As an illustration of the difference, McNeill provides two examples of a climbing gesture: one involving the speaker moving his/her hands up and down in a replication of the climbing motion of the protagonist (C-VPT), and the other a simple upward movement depicting the ascension (O-VPT) (McNeill, 1992:119).

Citing unpublished empirical findings from Church et al. (1989), as well as his own observations, McNeill notes that Character Viewpoint, which minimizes the distance between the narrator and the actual event, is more likely to occur with transitive verbs and single clause sentences, which also serve to minimize the narrator-event distance. It is also most common in depictions of central events in the story line. Observer Viewpoint, on the other hand, occurs more with intransitive or stative verbs as well as multi-clause sentences, all devices that introduce distance between the narrator and the story line. Observer Viewpoint, then, can be found more often in depictions of events peripheral to the story line. These linguistic features of the accompanying speech as well as status of the event being described, may well explain the intra-language results on gesture perspective in Kita and Özyürek (2003). Indeed, it might be argued that the *swinging* event is more central to its particular cartoon scene



than the *rolling* event is. (See Appendix II for a description of the two scenes in which these events take place.)

Unfortunately, a McNeillian account is less likely to explain inter-language differences such as those observed between Turkish speakers on one hand and English and Japanese speakers on the other hand (Kita & Özyürek, 2003), unless speakers of each language use different verbs frames to describe the same motion, or the importance of the event is perceived differently crosslinguistically – neither of which seem particularly plausible. In a comparison of German Sign Language and Turkish Sign Language, Perniss and Özyürek (in press) do address the issue of crosslinguistic similarities and differences in viewpoint as they pertain to signed languages. They adopt the term *character perspective* to characterize a sign in which “[t]he signer assumes the role of a character in the event, such that at least the character’s head and torso are mapped onto the signer’s body, and the size of the projected space is life-sized.” They use *observer perspective* to represent a sign in which “[t]he event space is projected onto sign space from an external vantage point. The signer is not part of the event represented, and the event space is reduced in size, projected onto the area of space in front of the signer.” (Perniss & Ozyurek, in press:3)

In terms of similarities, both German signers and Turkish signers generally preferred character perspective over observer perspective in representations of motion, location, and action. This, of course, contrasts with the previous results from co-speech gestures. However, crosslinguistic differences were revealed in the use of perspective and classifier type. German signers used more character perspective with entity

classifier predicates than Turkish signers. In contrast, Turkish signers tended to use observer perspective with handling classifiers, a phenomenon not attested in the German Sign Language corpus. In order to explain these differences, Perniss and Özyürek suggested the existence of crosslinguistically differing linguistic or discourse constraints on the depiction of simultaneous referents. Regardless of whether such factors turn out to be universal and lead to a typology of perspective taking in signed languages or whether they are relevant only for the languages considered, the main point is that perspective taking in the manual modality, be it sign or gesture, seems to vary crosslinguistically.

#### **6.2.3.3 Acquisition of expression of Manner and Path in L1**

Consequences of fundamental typological differences in expression of Manner and Path can also be seen in L1 acquisition. Thus, English-speaking children, who primarily need to acquire a relatively simple mono-clausal syntactic construction, exhibit utterances combining Manner and Path in spontaneous speech from 19 months of age. Korean-speaking children, on the other hand, who need more complex syntactic constructions that may involve subordination, do not exhibit such utterances in spontaneous speech until after 24 months of age (Choi & Bowerman, 1991). Similarly, Allen et al. (2006) found that English-speaking children were more target-like in preference for mono-clause constructions to describe Manner and Path at age three than either Japanese or Turkish-speaking children, who did not yet exhibit target-like preferences for multi-clause constructions with subordinating constructions. Moreover,

Brown, Özyürek, Allen, Kita, Ishizuka & Furman (2005) found that when more complex subordinated constructions are required to express incidental relationships between Manner and Path (cf. Kita et al., under review), English-speaking children had not yet incorporated them into productive use by the age of three.

#### **6.2.3.4 Acquisition of expression of Manner and Path in L2**

In addition to implications for L1 acquisition, implications of typological expression Manner and Path can also be seen in acquisition of a second language. Inagaki (2001; 2002a) explored the acquisition of Manner verbs with directional prepositional phrases among Japanese learners of English. He hypothesized that because the L1 (Japanese) system described above constitutes a subset of the L2 (English) system with respect to options for expressing Manner verbs plus ambiguous (directional versus locational) PPs (e.g. *he swam under the bridge*), Japanese learners of English would either not notice or misanalyze the positive evidence in the input needed for a restructuring of constraints on event construal. As expected, when presented with these ambiguous PPs, Japanese learners of English primarily assigned them locational readings, as opposed to native speakers of English, who largely allowed both locational and directional readings. Inagaki suggested that this phenomenon resulted from L1 transfer, but acknowledged that in order to support this, an additional population of learners whose L1 was similar to English was needed.

Similarly, Cadierno & Ruiz (2006), observing Danish (satellite-framed) and Italian (verb-framed) learners of Spanish at the advanced level, found that the Danish

L1 group produced clauses with Manner and Path for boundary crossing events, yielding ungrammatical utterances in their L2 Spanish. This phenomenon suggested that transfer persists at higher levels of proficiency.

Brown, Allen, Özyürek, Kita, & Ishizuka (submitted) investigated a population of Japanese learners of English at low and high intermediate stages of proficiency in the L2. They found potential evidence for a U-shaped pattern of development in that lower proficiency learners exhibited mono-clausal combinations of Manner and Path typical of English native speakers, whereas higher proficiency learners exhibited a bi-clausal structure, more characteristic of their L1, Japanese. They further discovered that what appeared to be target-like production in L2 speech at the lower proficiency level was not accompanied by target-like gestures. In other words, mono-clausal speech combining Manner and Path, which would normally be accompanied by single stroke gestures conflating Manner and Path in native English production (cf. Kita & Özyürek, 2003), was in fact accompanied by gesture strokes separating Manner and Path. Again, without data from learner populations with other L1 backgrounds, it is not clear whether such gesture patterns are universal in L2 development or result from L1 transfer. Nonetheless, it was concluded that the incongruence between speech and gesture at this proficiency level at least suggested that constructions exhibited in speech were formulaic in nature.

Observing Spanish speakers of English and intermediate and advanced levels of proficiency, Stam (2006), also found that learners exhibited gesture patterns characteristic of their L1. Though populations were rather small (five participants in

each learner group), learners exhibited instances of gestures depicting Manner only, gestures not seen in the native English speaker sample. These patterns did not seem to be affected by proficiency level. In other work in the same domain, however, Özyürek (2002) found that at the highest level of L2 proficiency, i.e. with substantial residence in the target-language community, Turkish learners of English were able to package Manner and Path in the same verb clause and in the same gesture stroke to a similar degree as native speakers of English.

#### **6.2.4 Summary**

In summary, a review of the literature on combined expression of Manner and Path tells us that typological preferences for lexicalization affect preferences for clause type in expression of Manner and Path. However, this is moderated by such notions as telicity, the crossing of boundaries, and unique lexical options that a given language may possess. Nonetheless, fundamental crosslinguistic differences impact encoding of Manner and Path, co-speech gesture patterns, L1 acquisition, and L2 acquisition, where even a certain degree of positive evidence may not be sufficient to engender the restructuring necessary for target-like L2 production. Moreover, gesture patterns may reveal this lack of restructuring in cases where they are incongruent with patterns in speech. These findings have much to offer by way of potential hypotheses for L1-L2 interactions within the multilingual mind, and we turn now to specific predictions that arise from previous work in the domain of combined expression of Manner and Path.

### 6.3 Predictions

Assuming the existence of crosslinguistic influence in the domain of combined expression of Manner and Path, the following predictions are postulated for our three populations: monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in their L1 and L2. These predictions are subsequently summarized in Table 6.2. It is important to note that, just as in previous chapters, predictions for the non-monolingual speakers are effectively educated guesses. While we know something about how combined expression of Manner and Path in an emerging L2 is affected by the established L1, we know nothing about how combined expression of Manner and Path in the established L1 might be affected by the emerging L2. Therefore, the predictions outlined below generally reflect the expectation that non-monolingual expression of Manner in L1 and L2 will be somewhere between monolingual expression of Manner in Japanese and English, as is often the case in specific L2 studies. Finally, predictions were not made with respect to boundary crossing as only one of the stimulus events, Bowling Roll, could have provided an appropriate test case.

Prediction 1: Clause-packaging preferences for combined expression of Manner and Path: use of single versus multiple clauses

*Monolingual Japanese speakers:* are predicted to prefer multiple clauses to package Manner and Path.

*Monolingual English speakers:* are predicted to package Manner and Path in single clauses.

*Non-monolingual Japanese speakers in L1:* are predicted to package Manner and Path both in single and multiple clauses.

*Non-monolingual Japanese speakers in L2:* are predicted to package Manner and Path both in single and multiple clauses, although syntactic and processing capabilities may constrain use of single clauses.

Prediction 2: Encoding of both Manner and Path in speech: explicit mention of both components in discourse.

*Monolingual Japanese speakers:* are predicted to encode both Manner and Path less often than monolingual English speakers.

*Monolingual English speakers:* are predicted to encode both Manner and Path to a high degree.

*Non-monolingual Japanese speakers in L1:* are predicted to encode both Manner and Path more often than monolingual Japanese speakers, but less often than monolingual English speakers.

*Non-monolingual Japanese speakers in L2:* are predicted to encode both Manner and Path less often than all groups as a result of lexical, syntactic, and possibly processing constraints.

Prediction 3: Gesture packaging for combined expression of Manner and Path: use of conflated versus separated clauses

*Monolingual Japanese speakers:* are predicted to produce both Manner-Path conflated gestures and Manner-only and Path-only gestures resulting from a greater number of multiple clauses.

*Monolingual English speakers:* are predicted to produce primarily Manner-Path conflated gestures.

*Non-monolingual Japanese speakers in L1:* are predicted to produce both conflated and separated gestures, but fewer Manner-only and Path-only gestures than monolingual Japanese speakers as a function of fewer multiple-clause descriptions

*Non-monolingual Japanese speakers in L2:* are predicted to produce both conflated and separated gestures, but these may exhibit incongruence with clause type.

Prediction 4: Gesture perspective in expression of Manner and Path: use of observer versus character perspective.

*All groups:* are expected to produce comparable numbers of “event-external” (observer) perspective and “event-internal” (character) perspective gestures for comparable events, with “event-external” (observer) perspective gestures dominating

Table 6.2: Summary of predictions for combination of Manner (M) and Path (P) in speech and gesture from monolingual English speakers, monolingual Japanese speakers, and native Japanese speakers with intermediate knowledge of English in L1 and L2

Predictions	Mono Japanese	Non-mono Japanese (L1)	Non-mono Japanese (L2)	Mono English
M & P packaged predominately in single clause	✗	✗/✓	✗/✓	✓
M & P packaged predominately in multiple clauses	✓	✗/✓	✗/✓	✗
Encoding of both M and P	✗	✗/✓	✗/✓	✓
Separate M-only and P-only gestures	✓	✗/✓	✗/✓	✗
Predominance of observer perspective in gesture	✓	✓	✓	✓



## **6.4 Method**

### **6.4.1 Participants**

A total of 57 participants were included in the analyses involved in this study: 13 monolingual English speakers, 16 monolingual Japanese speakers, and 28 native Japanese speakers with intermediate knowledge of English. All of these individuals described the target motion events in speech. A subset of the participants also produced gestures accompanying their spoken descriptions. Speech and gesture data were analyzed separately. Biographical information for these groups can be found summarized in the general methodology section in Chapter 3 and detailed in Appendix I.

### **6.4.2 Stimuli**

Explanations and screen shots of these animated motion events can be found in the general methodology section in Chapter 3 and in Appendix II.

### **6.4.3 Procedure**

The procedure for data collection was as laid out in the general methodology section in Chapter 3.

### **6.4.4 Combined Manner and Path speech coding**

After segmenting spontaneous speech into verb clauses and isolating those that described the target motion events, narratives were coded for combined expression of

Manner and Path. Full lists of lexical items coded as Manner or Path for each target motion event are displayed in Appendix III. Coding of Manner and Path speech was conducted at two levels: clause and discourse. Examples of this from the data in English (16) – (18) and Japanese (19) – (21) appear below with relevant expressions underlined.

(16) [*he swung across the street*]

(17) [*he swang like Tarzan kind of*]

(18) [*to try to get over to Tweety's window*]

(19) [*biru-kara    biru-e            tobi-utsurouto shimasu]*

building-from    building-to            fly-move.try.to do

Lit: '(He) tries to fly move from one building to another'

(20) [*suwingu            kou    furiko-no-youni*]

swing                    like    pendulum-Gen-like

Lit: '(He) swings like a pendulum'

(21) [*mukou-ni            utsuru*]

other.side-to    move

Lit: '(He) moves to the other side'

Example (16) is a Manner-Path clause from the English data with Manner as a main verb and Path in an accompanying adverbial. (17) and (18) illustrate Manner-only and Path-only clauses respectively. (17) contains a Manner main verb as well as a comparison adverbial. (18) contains a Path main verb with additional Path adverbial and preposition. The Manner-Path example from Japanese in (19) illustrates Manner as

the first part of a verb compound, with the latter half of the compound expressing Path. Path is also encoded in two directional adpositions. Examples (20) and (21) demonstrate Manner-only and Path-only clauses respectively, with Manner expressed as a main verb (a borrowing from English) and also as a comparison adverbial, and Path expressed in both a verb and directional adposition.

Analyses focused on the extent to which Manner and Path was packaged in single or multiple clauses and the degree to which both components were included in a given event description. Additional analyses examined whether speakers employed both Manner and Path in single clauses involving the crossing of a boundary. Of particular relevance for this latter question were descriptions of Sylvester's rolling into the bowling center in the Bowling Roll event. Results for speech analyses can be found in section 6.5.

#### **6.4.5 Combined Manner and Path gesture coding**

Representational gesture strokes were isolated according to the procedure laid out in Chapter 3. Gestures were coded as exhibiting a Path component following the guidelines in Chapter 4 and exhibiting a Manner component following the guidelines in Chapter 5.<sup>6</sup> For illustrations of Path-only and Manner-only gestures, see Figures 4.1 and 5.1 in Chapters 4 and 5 respectively.

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<sup>6</sup> As in Chapter 5, arc-shaped gestures in descriptions of Rope Swing were coded as Manner-Path conflated gestures with the arc shape reflecting the Manner component (swinging action) of these motion events.

However, gestures were also coded according to the perspective taken. While Kita and Özyürek (2003) only used the dimension of direction, McNeill (1992) described a number of other dimensions that could potentially be involved in depiction of a given perspective. These were operationalized in a more fine-grained analysis by Gullberg (1998), whose broad guidelines were followed here. Thus, perspective was coded along three dimensions: direction, hand-shape, and handedness. A combination of sagittal direction, with an enactment hand-shape employing both hands was considered to exhibit full character perspective, while a combination of lateral direction, with no enactment hand-shape employing only one hand was considered to exhibit full observer perspective.

However, these specifications did not apply to both Manner and Path gestures not to gestures depicting all events. Direction criteria, for example, were not applied to Manner-only gestures since the gesture did not move location. Enactment hand-shape criteria were not applied to descriptions of Bowling Roll because in order for the speaker to fully assume the perspective of the protagonist in this domain, s/he would actually have to roll, which would constitute a mime and not a gesture. Such a gesturing pattern may be expected in descriptions of this event by children, but not by adults. Similarly, direction was not a feature relevant for the climbing events, since really the only possible direction an appropriate gesture could go in was upwards. Coding specifications for the three perspective categories as well as the particular events they were relevant for are listed in Table 6.3.

Table 6.3: Coding specifications for the coding categories: direction, hand-shape, handedness

Coding category	Coding specifications	Relevant gestures	Relevant events
Direction	<i>Lateral axis</i> - across the body <i>Sagittal axis</i> - straight out from the body	Path-only Manner-Path	Bowling Roll Rope Swing
Hand-shape	<i>Enactment</i> - hands enacting the movement of the protagonist, e.g. holding an imaginary rope <i>Non-enactment</i> - no evidence of enactment	All gesture types	Bowling Climb Drainpipe Climb Rope Swing
Handedness	<i>One-handed</i> - use of single manual articulator <i>Bi-manual</i> - use of both manual articulators	All gesture types	All events

Figure 6.1 shows stills of a typical Manner-Path conflated gesture produced in a description of Rope Swing, with Manner depicted in the arc and Path in the trajectory. Along the dimensions of perspective, this gesture was coded as follows: sagittal axis, enactment hand-shape, bi-manual.



Figure 6.1: Stills from the production of a Manner-Path gesture in the description of Rope Swing

Analyses of gestures consisted of identifying the frequency with which both Manner and Path were present in the same conflated gesture versus in separate gestures, as well as identifying the preferred perspective, along each of the three dimensions, from which gestures were deployed. Examples of gesture coding processes as applied to clauses describing Bowling Roll appear below with individual gesture strokes indicated by boldface and numbered.

(22) [***and rolls down** the hill with it<sup>1st</sup> into a bowling alley*]

<sup>1st</sup> Simultaneous Manner-Path gesture: hand rotating while moving along a trajectory. Gesture is lateral but bi-manual (hand-shape criteria not applied for this event).

(23) [*saka-wo **korogete**<sup>1st</sup>*]<sup>7</sup>

hill-Acc roll.Con

[*bo-ringu jyou-ni sonomama **haitte**<sup>2nd</sup> ikuto*]

bowling alley-to in.that.way enter.Con go.Con

Lit: '(It) rolls the hill, goes enters to the bowling alley like that.'

<sup>1st</sup> Simultaneous Manner-Path gesture: hand rotating while moving along a trajectory. Gesture is lateral but bi-manual.

<sup>2nd</sup> Path-only gesture: hand moving along a trajectory with no rotation. Gesture is lateral and one-handed.

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<sup>7</sup> Native Japanese speakers may argue that this sentence also contains Path as well as Manner since the verb *korogaru* 'roll' in combination with a Ground phrase without directional particle could encode implicit Path semantics. This might also explain the acceptability of the particular sentence *shita-ni korogaru* 'roll to the downness/ roll down' described in footnote 4. However, for the purpose of this dissertation, *korogaru* has been coded a Manner verb and as such, the first clause in is considered a Manner only clause, while the second is considered a Path clause.

Example (22) from the English data illustrates a mono-clausal utterance with Manner and Path semantics, which was accompanied by a single stroke gesture depicting Manner and Path in a conflated movement, i.e. rotation of hand while moving along a trajectory. The gesture was lateral, depicting observer perspective on this dimension. However, both articulators were involved, giving the gesture a character perspective code on the handedness dimension. Example (23) from the Japanese data illustrates a bi-clausal utterance with one clause expressing Manner and the other expressing Path. Here the speaker produced two gestures, one a Manner-Path conflated gesture co-occurring with the Manner clause, and the other a Path-only gesture co-occurring with the Path clause, in a pattern much like that described in Kita and Özyürek (2003). The Manner-Path gesture was descriptively comparable to that in (22), whereas the Path gesture exhibited observer perspective along both dimensions of direction and handedness. Results for gesture analyses can be found in section 6.5.

## 6.5 Results

As discussed in Chapter 3, non-parametric procedures were used for all quantitative analyses. Results are divided into five major sections. We first present results from a number of analyses of L1 production in speech (section 6.5.1) and gesture (section 6.5.2). For these analyses, three main groups are compared: monolingual Japanese speakers (J), monolingual English speakers (E), and native Japanese speakers with intermediate knowledge of English performing in their L1 (J (E)). Second, we present results of analyses of L2 production in speech (section 6.5.3)

and gesture (section 6.5.4). For these analyses, native Japanese speakers with intermediate knowledge of English, this time performing in their L2 (E (J)), were compared to each of the monolingual groups: (E) and (J). Finally, within-subject analyses were conducted on the non-monolingual Japanese group in order to compare production of speech and gesture in their L1 and L2 (section 6.5.5). Again prior to all primary analyses, the non-monolingual Japanese group resident in Japan was compared to its counterpart resident in the USA, and in the event of no differences between them, the data were collapsed to form one group of native Japanese speakers with intermediate knowledge of English.

### **6.5.1 Expression of Manner and Path in L1 speech**

Analyses of expression of Manner and Path in L1 speech were conducted to determine clause-packaging preferences for participant groups and to identify the extent to which both components were explicitly mentioned in event descriptions. These analyses differ from analyses in previous chapters because we are interested in whether and how the components of Manner and Path were *combined* in clauses and event descriptions and not simply how Manner was lexicalized, how Path was lexicalized and whether they were encoded independently of each other.



### 6.5.1.1 Clause-packaging preferences for expressing Manner and Path in L1 speech

Unlike analyses in previous chapters, the analysis of clause-packaging preferences in combined expression of Manner and Path only considered those event descriptions in which both Manner and Path were actually present. Once these descriptions had been identified, clauses were coded for one of three possibilities: Manner-only, Path-only, or combined Manner-Path. Examples of these categories for English and Japanese can be found in (16) - (21). Table 6.4 shows a summary of the mean proportion of Manner-only, Path-only and Manner-Path clauses out of all relevant event descriptions containing Manner and Path across L1 groups.

Table 6.4: *Mean proportion (SD) of Manner-only, Path-only and Manner-Path clauses out of all target motion clauses in all relevant event descriptions containing Manner and Path across L1 groups*

	Mono Japanese (J) n=15	L1 Non-mono Japanese Japan (J (E:Japan)) n=14	L1 Non-mono Japanese USA (J (E:USA)) n=11	Mono English (E) n=13
M-only	.02 (.06)	.13 (.17)	.09 (.10)	.03 (.07)
Path-only	.27 (.22)	.37 (.16)	.36 (.20)	.18 (.16)
Manner-Path	.71 (.24)	.50 (.26)	.56 (.23)	.79 (.20)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of non-monolinguals for proportion of Manner-only clauses ( $z = -.514$ ,  $p = .607$ ), for proportion of Path-only clauses ( $z = -.250$ ,  $p = .802$ ), or for proportion of Manner-Path clauses ( $z = -.028$ ,  $p = .978$ ). Therefore, these two sub-groups were collapsed. Furthermore, despite some variability in the data, no group exhibited a bimodal distribution.

Next, three separate analyses were conducted to evaluate differences between language groups in production of each clause option for combined expression of Manner and Path. Figure 6.2 shows an error bar plot illustrating mean proportion of Manner-only clauses out of all clauses in all events containing Manner and Path across the three main L1 groups.

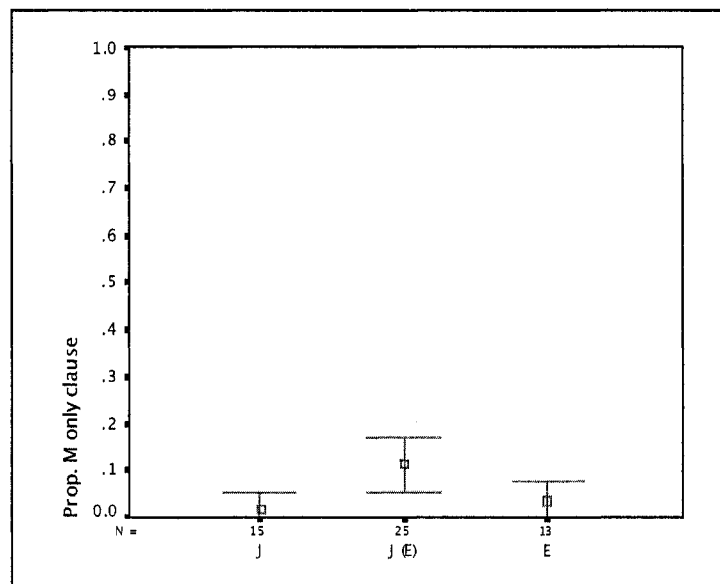


Figure 6.2: Mean proportion of Manner-only clauses out of all motion clauses in all events containing Manner and Path across three L1 groups: J (monolingual Japanese speakers), J (E) (native Japanese speakers with intermediate L2 English resident in Japan and the USA), and E (monolingual English speakers)

A Kruskal-Wallis test showed a significant difference in mean proportion of Manner-only clauses out of all motion clauses among groups:  $\chi^2(2, N=53) = 7.049, p = .029$ . Follow-up tests revealed that, rather surprisingly, the combined group of non-monolingual Japanese speakers produced significantly more Manner-only clauses than monolingual Japanese speakers, but did not differ significantly from monolingual

English speakers. Furthermore, contrary to predictions based on previous studies, there was no monolingual baseline difference in this area.

The second analysis, which focused on production of Path-only clauses, is illustrated in the error plot in Figure 6.3.

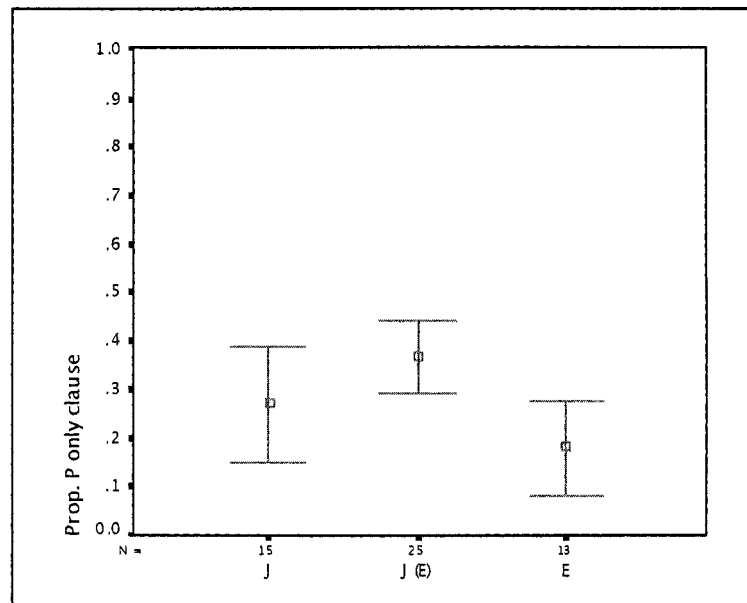


Figure 6.3: Mean proportion of Path-only clauses out of all motion clauses in all events containing Manner and Path across three L1 groups: J, J (E), and E

A second Kruskal-Wallis test showed a significant difference in mean proportion of Path-only clauses out of all motion clauses among groups:  $\chi^2(2, N=53) = 9.641$ ,  $p = .008$ . Follow-up tests revealed that this time the combined group of non-monolingual Japanese speakers produced significantly more Path-only clauses than monolingual English speakers, but did not differ significantly from monolingual Japanese speakers, although a trend similar to the difference found for Manner-only clauses may be observed. Furthermore, again contrary to predictions, there was no monolingual baseline difference in this area.

The third analysis focused on production of Manner-Path clauses as illustrated in Figure 6.4.

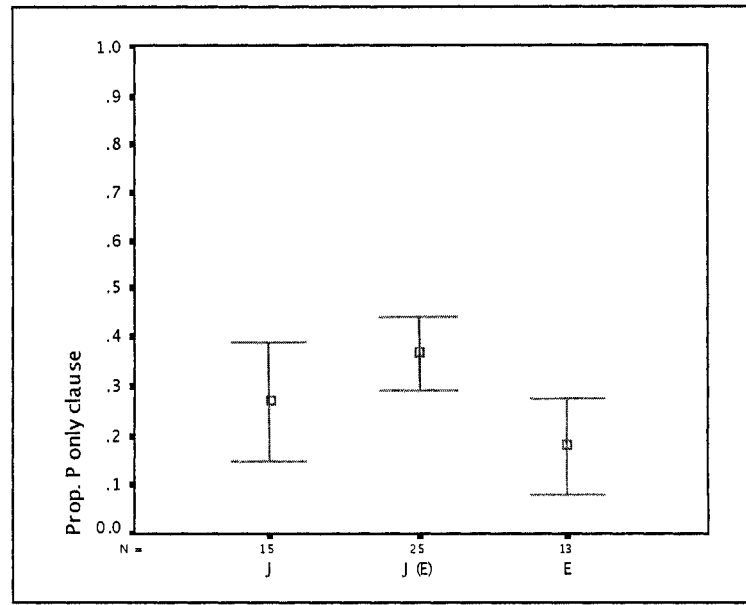


Figure 6.4: Mean proportion of Manner-Path clauses out of all motion clauses in all events containing Manner and Path across three LI groups: J, J(E), and E

The final Kruskal-Wallis test showed a significant difference in mean proportion of Manner-Path clauses out of all clauses among groups:  $\chi^2(2, N=53) = 11.374, p = .003$ . Follow-up tests produced the most surprising results of all; that the combined group of non-monolingual Japanese speakers produced significantly fewer Manner-Path clauses than both groups of monolingual speakers, and once again contrary to predictions, there was no monolingual baseline difference in this area.

In summary, results for clause preferences were rather unexpected. Instead of packaging Manner and Path in multiple clauses as speakers of other verb-framed languages generally do, monolingual Japanese speakers preferred mono-clausal structures. In contrast, non-monolingual Japanese speakers produced both constructions

in roughly equal proportions, and did not appear to exploit knowledge of mono-clausal structures in English. The obvious first question is how monolingual Japanese speakers were able to produce a mono-clausal structure, and second, what were non-monolinguals doing. The key may lie in expression of Manner. Thus, several post-hoc analyses were undertaken to investigate this further.

Recall from section 6.2.2 that there are several ways in which Manner can be expressed in Japanese: (1) as a main verb, (2) as a mimetic, (3) as an adverbial comparison, (4) as the first component in a compound verb, and (5) as the first component in a complex motion predicate. Options (2) – (5) allow additional expression of Path in the same verb clause. However, since (1) typically does not allow the inclusion of directional adpositions in the same clause, use of Manner as a main verb syntactically constrains combined expression of Manner and Path. The question, then, is which options were employed by monolingual and non-monolingual speakers of Japanese.

Table 6.5 illustrates the options selected by each group of speakers both in Manner-only and in Manner-Path clauses. Use of verbs has been divided into two groups: Manner verbs that syntactically constrain expression of Path in the same clause (main verbs), and Manner verbs which do not (compound and complex verbs).

Table 6.5: *Percentage of Manner-only and Manner-Path clauses containing constraining Manner verbs, non-constraining Manner verbs, Manner mimetics and/or Manner adverbial comparisons in monolingual and non-monolingual Japanese event descriptions*<sup>8</sup>

	Constrain M verb	Non-constrain M verb	M mimetic	M comparison
Mono Japanese (n = 34 clauses)	18%	56%	41%	12%
Non-mono Japanese (n = 73 clauses)	26%	51%	22%	18%

From the post-hoc description in Table 6.5, we observe a potentially interesting pattern. In expression of Manner, Japanese monolinguals appear to employ lexical resources that do not constrain expression of Path in the same clause to a greater extent than non-monolingual Japanese speakers, particularly in the case of mimetics. With such a selection, they are able to produce mono-clausal Manner-Path utterances. Although non-monolingual Japanese speakers do use more adverbial comparisons than monolingual Japanese, they select main verbs to express Manner more often and use fewer non-constraining alternatives, especially mimetics. With this selection, non-monolinguals would be forced to distribute Manner and Path information across two clauses because of the grammatical restriction on combining Manner main verbs and Path adverbials within the same clause, illustrated in example (12).

### 6.5.1.2 Encoding of Manner and Path in L1 speech

Concluding our analyses of combinations of Manner and Path in L1 speech, we test the extent to which both components were explicitly mentioned in event

<sup>8</sup> These percentages do not add up to 100% because it is possible for all of the categories to be used in combination within a single verb clause, e.g. [*gorogoro korogatte iku*] – Manner mimetic + non-constraining Manner verb + Path verb

descriptions. We have seen that despite expected differences in clausal packaging, monolingual Japanese speakers actually used proportionately the same number of mono-clausal structures as monolingual English speakers, by employing non-constraining lexicalization options for Manner expression, e.g. mimetics. Non-monolinguals, in contrast, used fewer constructions of this kind, separating out Manner and Path into different clauses proportionately more often. This makes our previous predictions for encoding of both Manner and Path in event descriptions a little more uncertain because if non-monolingual speakers required two clauses to expression Manner and Path, one might have been dropped in spontaneous narratives. Table 6.6 illustrates how often both Manner and Path were included in event descriptions across L1 groups.

Table 6.6: Mean proportion (SD) of total event descriptions encoding Manner and Path across L1 groups

	Mono Japanese (J) n=16	L1 Non-mono Japanese Japan (J (E:Japan)) n=15	L1 Non-mono Japanese USA (J (E:USA)) n=13	Mono English (E) n=13
M and P	.45 (.20)	.55 (.24)	.57 (.33)	.96 (.14)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of non-monolinguals for proportion of descriptions encoding both Manner and Path in event descriptions ( $z = -.482$ ,  $p = .630$ ). Therefore, these two sub-groups were collapsed.

Figure 6.5 shows an error bar plot illustrating mean proportion of event descriptions with both Manner and Path across the three main L1 groups.

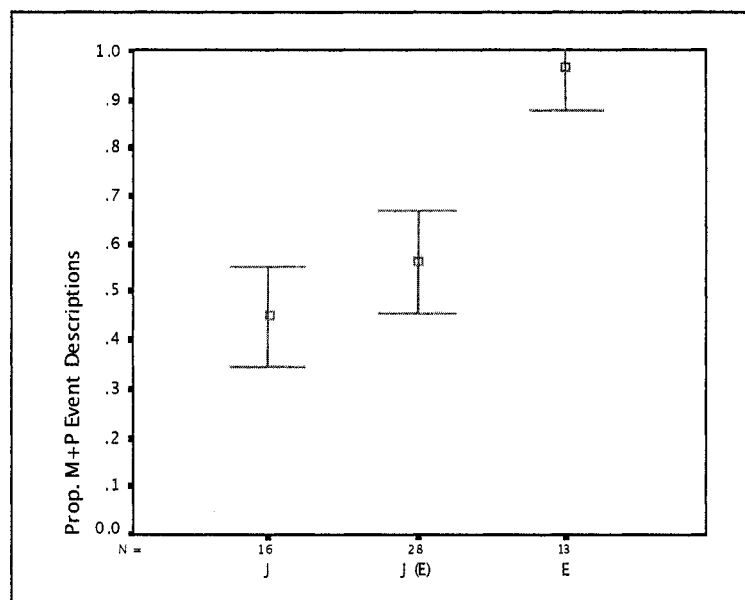


Figure 6.5: Mean proportion of event descriptions encoding both Manner and Path across three L1 groups: J, J (E), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of event descriptions encoding both Manner and Path among groups:  $\chi^2(2, N=57) = 25.149, p < .001$ . Follow-up tests revealed that monolingual English speakers encoded Manner and Path significantly more often in their event descriptions than both groups of Japanese speakers. No significant intra-language differences were found, but the general trend is such that the combined group of Japanese speakers with knowledge of English included both components in a slightly higher proportion of events than monolingual Japanese speakers ( $\bar{\chi} .56$  versus  $\bar{\chi} .45$ , with comparable variability).

In sum, monolingual Japanese speakers encoded both Manner and Path in a little under half of their narratives, and when they did, they typically packaged the information in a single clause. Non-monolingual Japanese speakers, however, encoded Manner and Path in a little over half of their narratives, but exhibited equal propensity



to package the components in a single clause or distribute the information over separate clauses. As these results do not quite match the inter- or intra-language predictions for speech laid out in section 6.3, analyses of gesture analyses become crucial to see if the same is true there.

### **6.5.2 Expression of Manner and Path in L1 gesture**

Analyses of L1 gesture assessed the extent to which Manner and Path were packaged together in conflated gestures or distributed over separate gestures as well as the perspective favored. As not all participants gestured, only a subset of participants are included in these analyses.<sup>9</sup>

#### **6.5.2.1 Packaging of Manner and Path in L1 gesture**

On the basis of previous research, monolingual English speakers were expected to produce predominantly conflated gestures matching mono-clausal structures in speech. Monolingual Japanese speakers, on the other hand, had been predicted to produce a high proportion of separate gestures to match multi-clause speech. However, given that speech results differed from predictions, it is likely that gesture results will also differ.

In these analyses, a tight comparison between gesture and speech production would be preferred such that the number of conflated or separated gestures is calculated for each single or multiple clause. However, since analyses in previous studies used

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<sup>9</sup> In order for participants to be included in the gesture analyses, they had to contribute at least one gesture in a description of any of the four events.

total number of gestures produced in all event descriptions as the denominator, the same procedure is followed here. In addition, this procedure is parallel to previous clause analyses, which also used total number of clauses produced in all event descriptions as the denominator. Table 6.7, then, illustrates the mean proportion of Manner-only, Path-only and Manner-Path conflated gestures out of all motion gestures produced in event descriptions containing both Manner and Path in speech across L1 groups.

Table 6.7: *Mean proportion (SD) of Manner-only, Path-only and Manner-Path conflated gestures out of all motion gestures produced in event descriptions containing both Manner and Path in speech across L1 groups*

	Mono Japanese (J) n=12	L1 Non-mono Japanese Japan (J (E:Japan)) n=10	L1 Non-mono Japanese USA (J (E:USA)) n=11	Mono English (E) n=11
M-only gesture	.16 (.31)	.05 (.08)	.05 (.09)	.12 (.30)
P-only gesture	.55 (.32)	.76 (.26)	.76 (.32)	.64 (.25)
M-P gesture	.30 (.27)	.19 (.21)	.20 (.31)	.26 (.16)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of non-monolingual Japanese speakers in proportion of Manner-only gestures ( $z = -.177$ ,  $p = .860$ ), in Path-only gestures ( $z = -.147$ ,  $p = .883$ ), or in Manner-Path gestures ( $z = -.373$ ,  $p = .709$ ). Therefore, these two sub-groups were collapsed.

Three separate analyses compared use of each gesture type. Figure 6.6 shows an error bar plot illustrating mean proportion of Manner-only gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups.

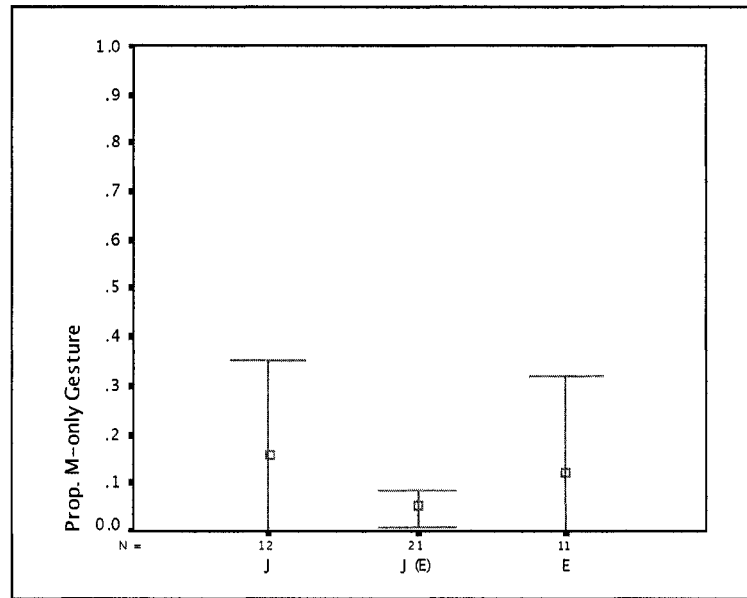


Figure 6.6: Mean proportion of Manner-only gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups: J, J (E), and E

A Kruskal-Wallis test revealed no significant difference in mean proportion of Manner only gestures out of all gestures in event descriptions containing both Manner and Path in speech produced by monolingual Japanese speakers, the combined group of non-monolingual Japanese speakers, and monolingual English speakers:  $\chi^2(2, N=44) = .452, p = .798$ . Therefore, all groups produced comparable proportions of Manner-only gestures, and these proportions were quite small.

A second analysis focused on Path gestures. Figure 6.7 shows an error bar plot illustrating mean proportion of Path-only gestures out of all motion gestures in event descriptions with both Manner and Path across the three main L1 groups.

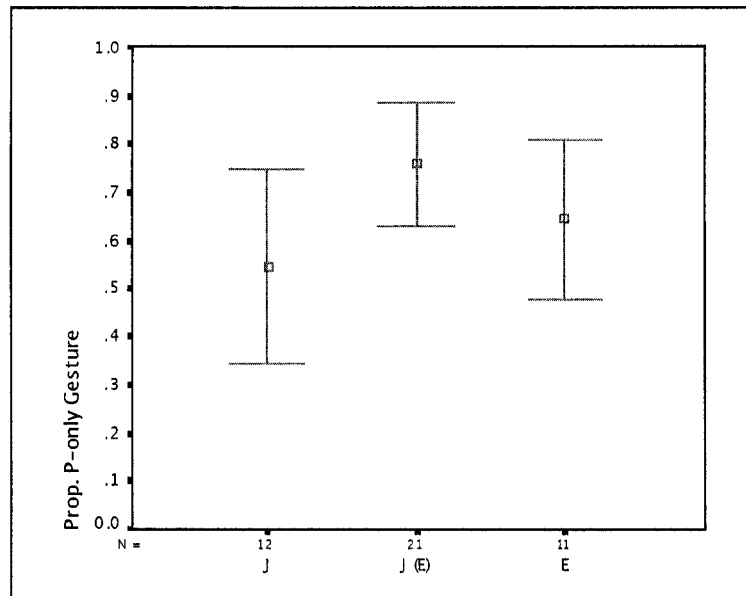


Figure 6.7: Mean proportion of Path-only gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups: J, J (E), and E

A Kruskal-Wallis test showed no significant difference in mean proportion of Path-only gestures out of all target motion gestures in event descriptions containing both Manner and Path in speech produced by monolingual Japanese speakers, the combined group of non-monolingual Japanese speakers, and monolingual English speakers:  $\chi^2(2, N=44) = 4.813, p = .090$ . Therefore, all groups produced comparable proportions of Path only gestures.

The third analysis investigated Manner-Path conflated gestures. Figure 6.8 shows an error bar plot illustrating mean proportion of Manner-Path conflated gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups.

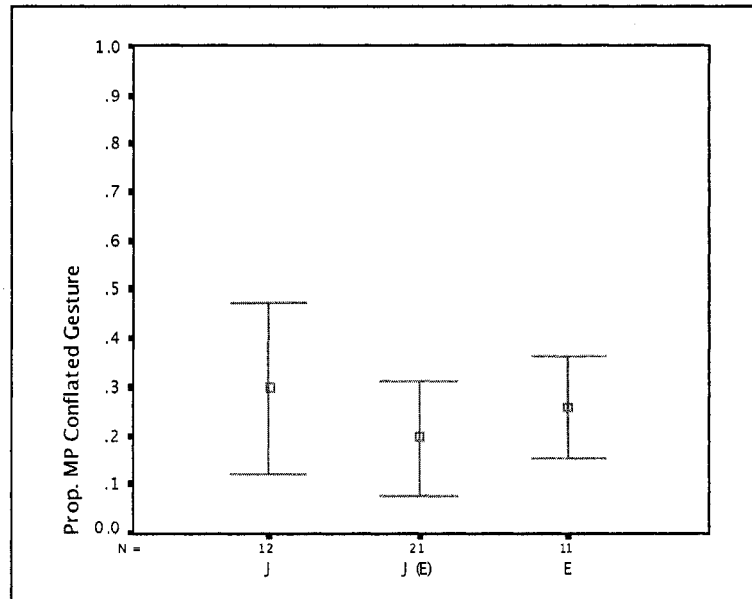


Figure 6.8: Mean proportion of Manner-Path gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups: J, J (E), and E

A final Kruskal-Wallis test showed no significant difference in mean proportion of Manner-Path conflated gestures out of all motion gestures in event descriptions containing both Manner and Path in speech produced by monolingual Japanese speakers, non-monolingual Japanese speakers, and monolingual English speakers:  $\chi^2(2, N=44) = 2.147, p = .342$ . Therefore, all groups produced comparable proportions of Manner-Path conflated gestures.

In sum, despite significant differences in clausal packaging across groups, there were no parallel significant differences in gesture packaging across groups. However, there are certain patterns worth noting. There were trends in proportion of Path-only and Manner-Path gestures following differences found in speech. More specifically, non-monolingual Japanese speakers appeared to produce more Path-only and fewer

Manner-Path gestures than both groups of monolinguals, a finding consistent with their preferences for multi-clause packaging of Manner and Path in speech.

#### **6.5.2.2 Perspective taking in L1 gesture**

Although perspective taking may differ crosslinguistically, no difference has been found in previous research between Japanese and English speakers. Thus, all groups were predicted to favor observer perspective. Perspective was operationalized along three dimensions: direction (sagittal versus lateral), hand-shape (enactment versus non-enactment), and handedness (bi-manual versus one-handed). These dimensions were of course correlated; therefore, speakers exhibiting full character perspective would produce a sagittal *and* bi-manual gesture *with* an enactment hand-shape. However, the correlation is not perfect, which explains why proportions are not equal in all dimensions.

Table 6.8 illustrates the mean proportion of sagittal direction, enactment hand-shape and bi-manual gestures (all types: Manner-only, Path-only, and Manner-Path) out of all motion gestures produced in event descriptions containing Manner and Path in speech across L1 groups.

Table 6.8: Mean proportion (SD) of sagittal direction, enactment hand-shape and bi-manual gestures out of all motion gestures produced in event descriptions containing Manner and Path in speech across L1 groups

	Mono Japanese (J) n=12	L1 Non-mono Japanese Japan (J (E:Japan)) n=9	L1 Non-mono Japanese USA (J (E:USA)) n=11	Mono English (E) n=11
Sagittal	.67 (.43)	.21 (.26)	.17 (.24)	.24 (.32)
Enactment	.72 (.37)	.38 (.45)	.14 (.22)	.13 (.30)
Bi-manual	.50 (.40)	.29 (.30)	.26 (.31)	.16 (.30)

The Mann-Whitney  $\underline{U}$  test indicated no significant difference between the two sub-groups of non-monolingual Japanese speakers in proportion of sagittal gestures ( $z = -.476$ ,  $p = .634$ ), proportion of enactment hand-shape gestures ( $z = -1.167$ ,  $p = .243$ ), or proportion of bi-manual gestures ( $z = -.354$ ,  $p = .723$ ). Therefore, these two sub-groups were collapsed. Furthermore, although the standard deviations in the table above are rather high, with the exception of the monolingual Japanese group for the bi-manual gesture property, no group exhibited a bimodal distribution over any of the dimensions. Thus, substantial variability seems to be a feature of the entire dataset in this domain.

As in analyses of semantic representation in gesture, three separate analyses compared use of each of the dimensions of perspective, specifically those which reflected character perspective. Figure 6.9 shows an error bar plot illustrating mean proportion of sagittal direction gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups.

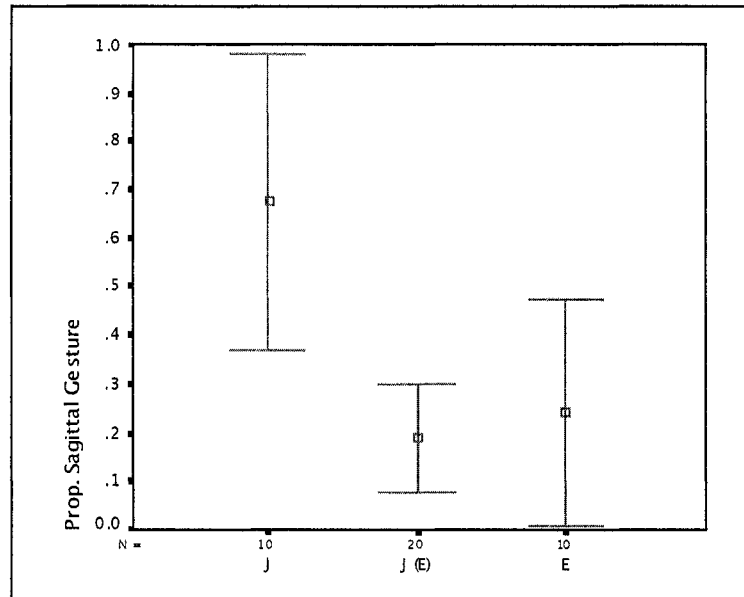


Figure 6.9: Mean proportion of sagittal direction gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups: J, J (E), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of sagittal direction gestures out of all motion gestures in event descriptions containing both Manner and Path in speech among groups:  $\chi^2(2, N=40) = 8.474, p = .014$ . Follow-up tests revealed that monolingual Japanese speakers produced significantly more sagittal direction gestures than both the combined group of non-monolingual Japanese speakers and monolingual English speakers, who did not significantly differ from each other.

The second analysis in Figure 6.10 shows an error bar plot illustrating mean proportion of gestures with enactment hand-shape out of all motion gestures in event descriptions with both Manner and Path across the three main L1 groups.



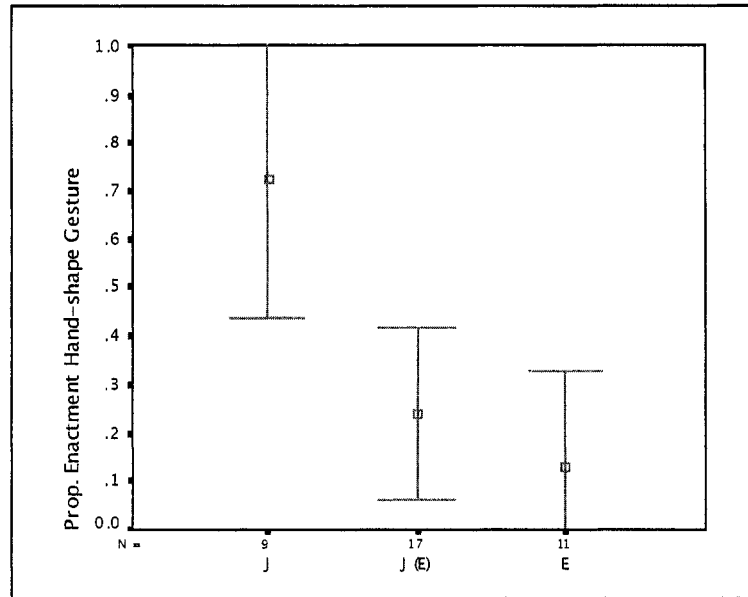


Figure 6.10: Mean proportion of gestures with enactment hand-shape out of all motion gestures in event descriptions with both Manner and Path across the three main L1 groups: J, J (E), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of gestures with enactment hand-shape out of all motion gestures in event descriptions containing both Manner and Path in speech among groups  $\chi^2(2, N=37) = 11.573, p = .003$ . Follow-up tests revealed that again monolingual Japanese speakers produced significantly more gestures with enactment hand-shape than both the combined group of non-monolingual Japanese and monolingual English speakers, who did not significantly differ from each other.

The third analysis in Figure 6.11 shows an error bar plot illustrating mean proportion of bi-manual gestures out of all gestures in event descriptions with both Manner and Path across the three main L1 groups.

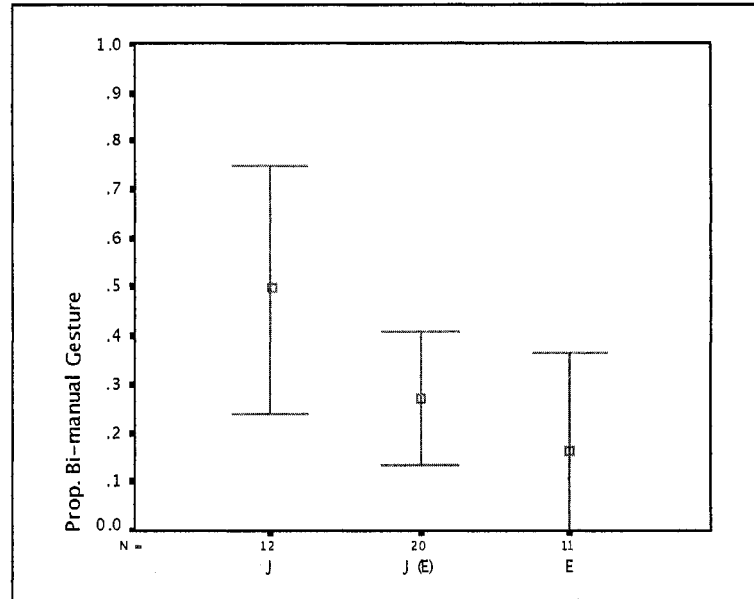


Figure 6.11: Mean proportion of bi-manual gestures out of all motion gestures in event descriptions with both Manner and Path across the three main L1 groups: J, J(E), and E

A Kruskal-Wallis test showed no significant difference in mean proportion of gestures with enactment hand-shape out of all motion gestures in event descriptions containing both Manner and Path in speech among groups:  $\chi^2(2, N=43) = 4.766, p = .092$ . However, there was a trend consistent with the findings above whereby monolingual Japanese speakers produced slightly more bi-manual gestures than both the combined group of non-monolingual Japanese and monolingual English speakers ( $\bar{\chi} .50$  versus  $\bar{\chi} .27$  and  $\bar{\chi} .16$  respectively). This particular statistical analysis may have been affected by the distribution of the monolingual Japanese data, which was bimodal.

In all of the analyses above, Japanese monolinguals conspicuously favored character perspective along the dimensions operationalized. However, in order to genuinely draw this conclusion, one should compare the proportion of gestures

exhibiting character perspective in all of the dimensions crosslinguistically. As noted in Table 6.3, not all of the dimensions were appropriate for all event descriptions. For example, direction was not applicable in descriptions of the climbing events because there was no possible sagittal / lateral dichotomy, only an upward direction. Therefore, in the analysis below, ‘full character perspective’ describes gestures exhibiting properties of character perspective in the maximum number of dimensions appropriate for any given event description. For example, only a gesture depicting Bowling Climb that was both bi-manual with an enactment hand-shape would be coded as full character perspective, and only a gesture depicting Rope Swing that was sagittal and bi-manual and with an enactment hand-shape would be coded as full character perspective. Table 6.9, then, provides mean proportion of gestures (all types: Manner, Path, Manner-Path) with full character perspective (sagittal, enactment and/or bi-manual) out of all motion gestures in event descriptions containing Manner and Path in speech across L1 groups.

Table 6.9: Mean proportion (SD) of full character perspective (sagittal, enactment and bi-manual) gestures out of all motion gestures produced in event descriptions containing Manner and Path in speech across L1 groups

	Mono Japanese (J) n=11	L1 Non-mono Japanese Japan (J (E:Japan)) n=10	L1 Non-mono Japanese USA (J (E:USA)) n=11	Mono English (E) n=11
Full character perspective	.39 (.33)	.12 (.18)	.08 (.12)	.12 (.30)

The Mann-Whitney U test indicated no significant difference between the two sub-groups of non-monolingual Japanese speakers in proportion of full character

perspective gestures ( $z = -.323$ ,  $p = .747$ ). Therefore, these two sub-groups were collapsed.

Figure 6.12 shows an error bar plot illustrating mean proportion of full character perspective gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups.

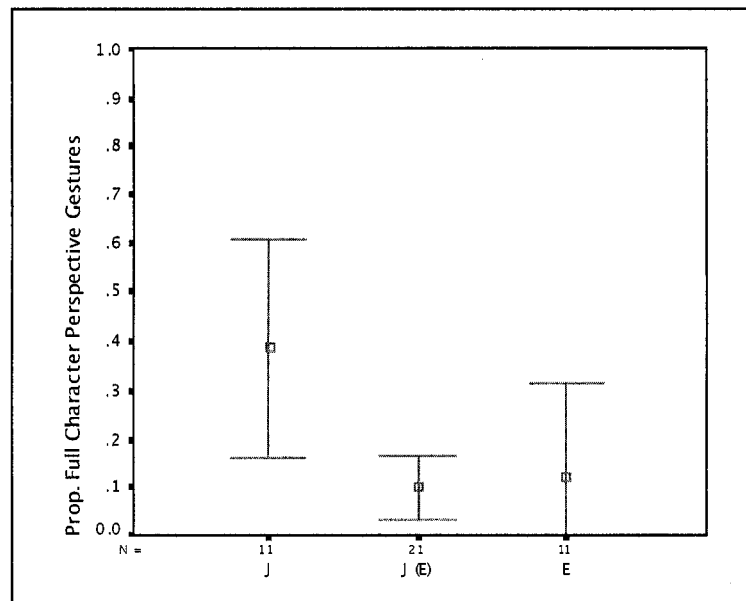


Figure 6.12: *Mean proportion of full character perspective gestures out of all motion gestures in event descriptions with both Manner and Path in speech across the three main L1 groups: J, J(E), and E*

A Kruskal-Wallis test showed a significant difference in mean proportion of full character perspective gestures out of all motion gestures in event descriptions containing both Manner and Path in speech among groups:  $\chi^2(2, N=43) = 9.294$ ,  $p = .01$ . As expected, follow-up tests revealed that monolingual Japanese speakers produced significantly more full character perspective gestures than both the combined group of non-monolingual Japanese speakers and monolingual English speakers, who

did not differ significantly from each other. However, even monolingual Japanese speakers, who exhibited the highest proportionate use, employed full character perspective less than half the time; therefore, full character perspective was not the most common option for any group.

In summary, it may be concluded that ‘full character perspective’ in gesture was not the preferred option for any of the groups in event descriptions containing both Manner and Path in speech. However, contrary to previous research, monolingual Japanese speakers actually exhibited a greater or at least equal proportion of character perspective as observer perspective in gesture along the dimensions of direction, hand-shape and handedness. Moreover, non-monolingual Japanese speakers differed significantly from monolingual Japanese in use of full character perspective, and in two of the three individual dimensions (direction and hand-shape), with a similar and rather strong trend in the third dimension (handedness).

### **6.5.3 Expression of Manner and Path in L2 speech**

Parallel analyses of expression of Manner and Path were conducted for the L2 speech of the same native Japanese speakers with intermediate knowledge of English to determine clause preferences for packaging Manner and Path in the L2 and the extent to which Manner and Path were explicitly expressed in L2 speech. Results for L2 production are shown below with the “target” monolingual English results and “source” monolingual Japanese results repeated for ease of comparison.

### 6.5.3.1 Clause-packaging preferences for expressing Manner and Path in L2 speech

Once again, the analysis of clause preferences in combined expression of Manner and Path only considered those event descriptions in which both Manner and Path were actually present. Table 6.10 shows a summary of the mean proportion of Manner-only, Path-only and Manner-Path clauses out of all motion clauses in all relevant event descriptions containing Manner and Path in L2 as compared to monolingual production.

Table 6.10: Mean proportion (SD) of Manner-only, Path-only and Manner-Path clauses out of all motion clauses in all relevant event descriptions containing Manner and Path in L2 and monolingual groups

	Mono Japanese (J) n=15	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L2 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=13
M-only	.02 (.06)	.13 (.17)	.25 (.23)	.03 (.07)
Path-only	.27 (.22)	.31 (.20)	.38 (.24)	.18 (.16)
Manner-Path	.71 (.24)	.56 (.31)	.37 (.26)	.79 (.20)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of L2 speakers for proportion of M only clauses ( $z = -1.438$ ,  $p = .150$ ), for proportion of P only clauses ( $z = -.486$ ,  $p = .627$ ) or for proportion of Manner-Path clauses ( $z = -1.664$ ,  $p = .096$ ). Therefore, these two sub-groups were collapsed.

Next, three analyses were conducted to evaluate differences between language groups in production of each clause option for combined expression of Manner and Path. Figure 6.13 shows an error bar plot illustrating mean proportion of Manner-only

clauses out of all motion clauses in all events containing Manner and Path across L2 and monolingual groups.

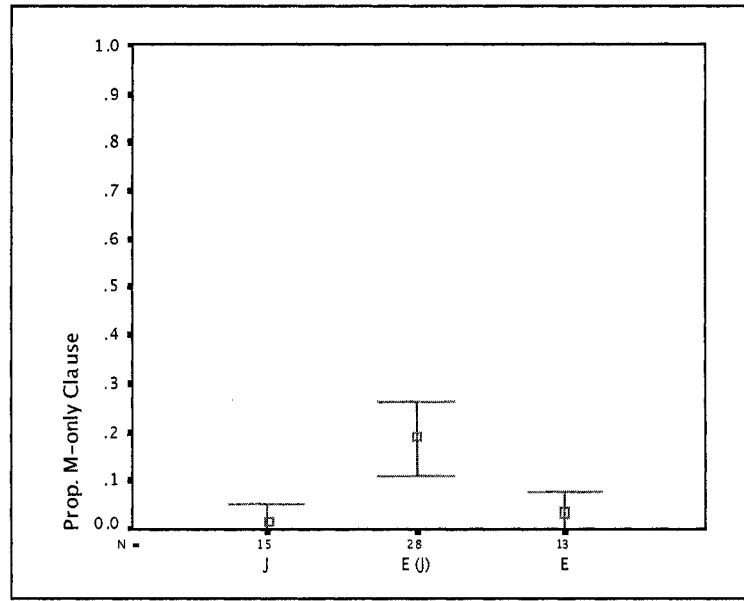


Figure 6.13: Mean proportion of Manner-only clauses out of all motion clauses in all events containing Manner and Path across L2 and monolingual groups: J (monolingual Japanese speakers), E (J) (native Japanese speakers with intermediate L2 English resident in Japan and the USA), and E (monolingual English speakers)

A Kruskal-Wallis test showed a significant difference in mean proportion of Manner-only clauses out of all motion clauses in all events containing Manner and Path among groups:  $\chi^2(2, N=56) = 12.021, p = .002$ . Follow-up tests revealed that in their L2, the combined group of Japanese speakers of English produced significantly more Manner-only clauses than monolingual speakers of the ‘target’ language, as well as monolingual speakers of the ‘source’ language.

The second analysis, illustrated in Figure 6.14, focused on production of Path-only clauses.

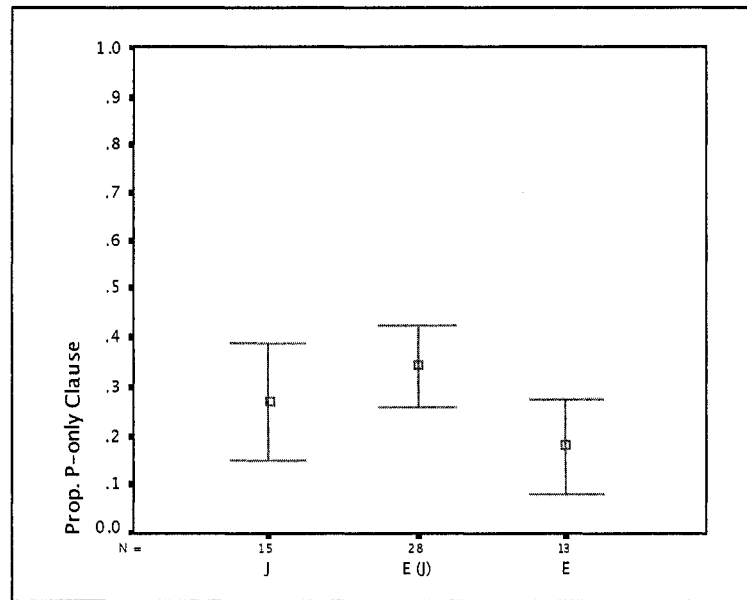


Figure 6.14: Mean proportion of Path-only clauses out of all motion clauses in all events containing Manner and Path in L2 and monolingual groups: J, E (J), and E

A second Kruskal-Wallis test showed a marginally significant difference in mean proportion of Path-only clauses out of all motion clauses in all events containing Manner and Path among groups:  $\chi^2(2, N=56) = 5.602, p = .061$ . There was a trend matching the difference above for the combined group of L2 speakers to produce more Path-only clauses than monolingual speakers of English and Japanese ( $\bar{\chi}$  .34 versus  $\bar{\chi}$  .18 and  $\bar{\chi}$  .27).

The third analysis focused on production of Manner-Path clauses as illustrated in Figure 6.15.



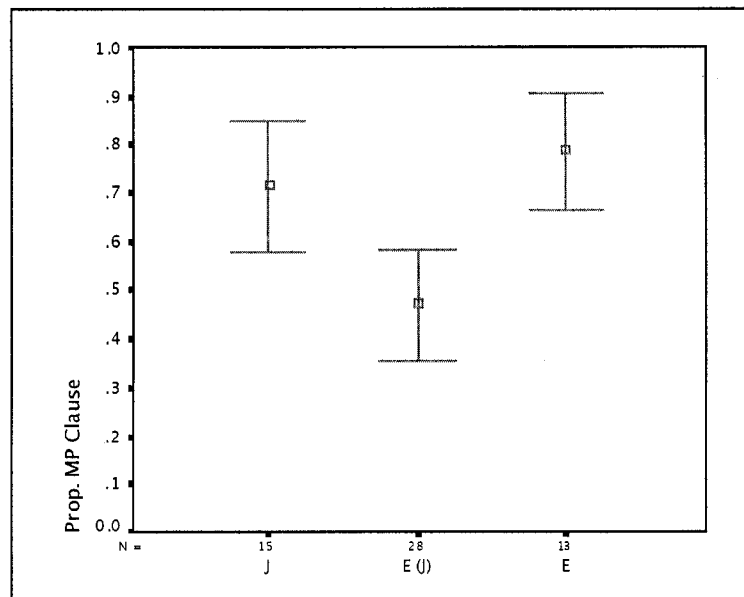


Figure 6.15: Mean proportion of Manner-Path clauses out of all motion clauses in all events containing Manner and Path in L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of Manner-Path clauses out of all motion clauses in all events containing Manner and Path among groups:  $\chi^2(2, N=56) = 12.690, p = .002$ . Follow-up tests revealed that the combined group of L2 speakers produced significantly fewer Manner-Path clauses than monolingual speakers of the ‘target’ language, as well as monolingual speakers of the ‘source’ language.

### 6.5.3.2 Encoding of Manner and Path in L2 speech

The extent to which both Manner and Path were explicitly mentioned concludes analyses of combinations of Manner and Path in L2 speech. Although L2 speakers employed both mono- and multi-clausal structures for expression of Manner and Path, results of L1 analyses demonstrate that this does not necessarily predict whether all

speakers mentioned Manner and Path in their event descriptions. Table 6.11 illustrates how often both Manner and Path were encoded in event descriptions in L2 and monolingual groups.

Table 6.11: Mean proportion (SD) of total event descriptions encoding both Manner and Path in L2 and monolingual groups

	Mono Japanese (J) n=16	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L2 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=13
M and P	.45 (.20)	.67 (.26)	.68 (.29)	.96 (.14)

A Mann-Whitney  $U$  test indicated no significant difference between the subgroups of L2 speakers in proportion of event descriptions encoding both Manner and Path ( $z = -.212$ ,  $p = .832$ ); therefore, they were collapsed.

Figure 6.16 shows an error bar plot illustrating mean proportion of total event descriptions encoding both Manner and Path across the L2 and monolingual groups.

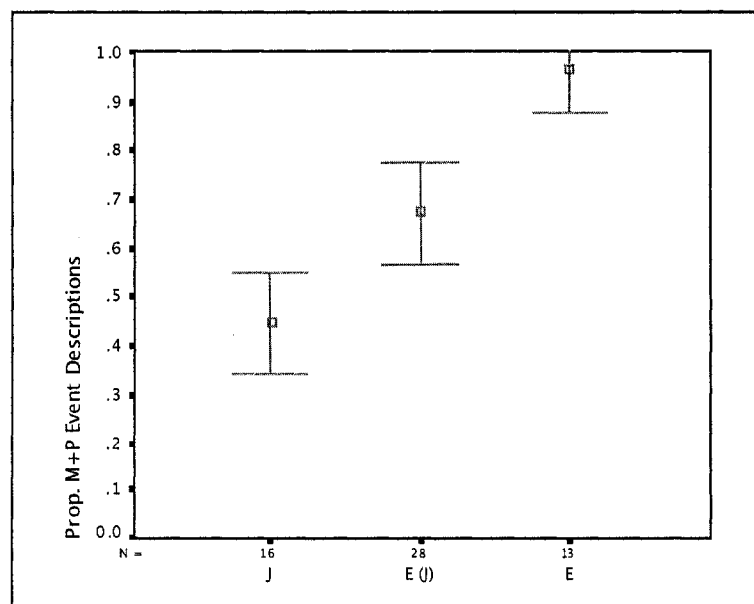


Figure 6.16: Mean proportion of total event descriptions encoding both Manner and Path across L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of event descriptions encoding both Manner and Path among groups:  $\chi^2(2, N=57) = 23.087, p < .001$ . Follow-up tests revealed significant differences between all three groups. Thus, the combined group of L2 English speakers encoded Manner and Path significantly less often in their event descriptions than monolingual English speakers, but significantly more often than monolingual Japanese speakers.

In summary, L2 English speakers distributed Manner and Path over multiple clauses more often than both groups of monolingual speakers, and encoded both components less often than monolingual speakers of the target language, albeit more often than monolingual speakers of the source language,.

#### **6.5.4 Expression of Manner and Path in L2 gesture**

Further analyses of gesture assessed the extent to which Manner and Path were packaged together in conflated gestures or distributed over separate gestures as well as the perspective favored in L2 production as compared to that of particularly monolingual speakers of the source language, but also monolingual speakers of the target language. In contrast to performance in L1, all non-monolingual Japanese speakers gestured in their L2; therefore all L2 participants are included here.

##### **6.5.4.1 Packaging of Manner and Path in L2 gesture**

Here, L2 speakers were predicted to produce both conflated and separated Manner and Path gestures to match their packaging of Manner and Path in single and

multiple clauses in speech. Table 6.12 illustrates the mean proportion of Manner-only, Path-only and Manner-Path conflated gestures out of all motion gestures produced in event descriptions containing Manner and Path in speech in L2 and monolingual groups.

Table 6.12: *Mean proportion (SD) of Manner-only, Path-only and Manner-Path conflated gestures out of all motion gestures produced in event descriptions containing Manner and Path in speech in L2 and monolingual groups*

	Mono Japanese (J) n=12	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L2 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=11
M-only gesture	.16 (.31)	.06 (.11)	.14 (.14)	.12 (.30)
P-only gesture	.55 (.32)	.77 (.21)	.67 (.24)	.64 (.25)
M-P gesture	.30 (.27)	.17 (.18)	.19 (.19)	.26 (.16)

A Mann-Whitney U test indicated no significant difference between the two sub-groups of L2 speakers in proportion of Manner-only gestures ( $z = -1.491$ ,  $p = .136$ ), Path-only gestures ( $z = -1.124$ ,  $p = .261$ ), or Manner-Path gestures ( $z = -.238$ ,  $p = .812$ ). Therefore, these two sub-groups were collapsed.

Again three separate analyses compared use of each gesture type. Figure 6.17 shows an error bar plot illustrating use of Manner-only gestures in L2 and monolingual groups.

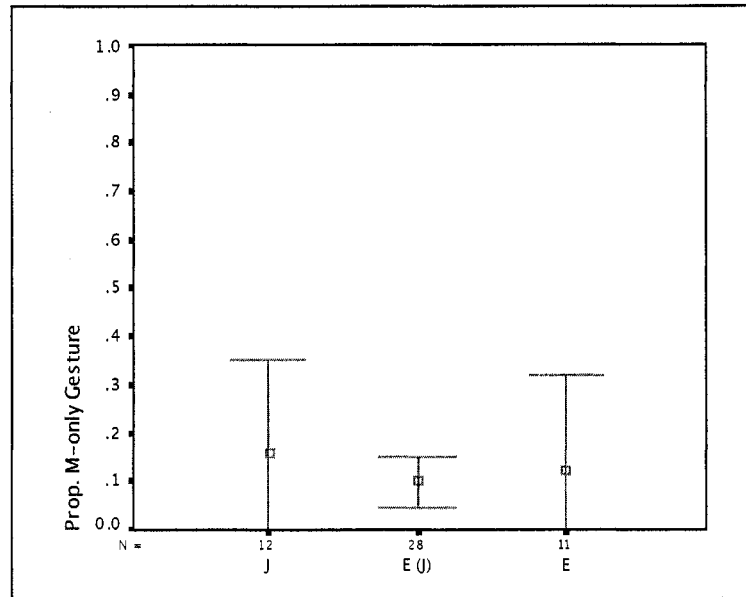


Figure 6.17: Mean proportion of Manner-only gestures out of all gestures in event descriptions with both Manner and Path in speech in L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed no significant difference in mean proportion of Manner-only gestures out of all motion gestures in event descriptions containing both Manner and Path in speech produced by the combined group of L2 speakers, monolingual English speakers, and monolingual Japanese speakers:  $\chi^2(2, N=51) = .501, p = .779$ . Therefore, all groups produced comparable proportions of Manner-only gestures, and again these proportions were quite small.

Figure 6.18 shows an error bar plot use of Path-only gestures in event descriptions in L2 and monolingual groups.

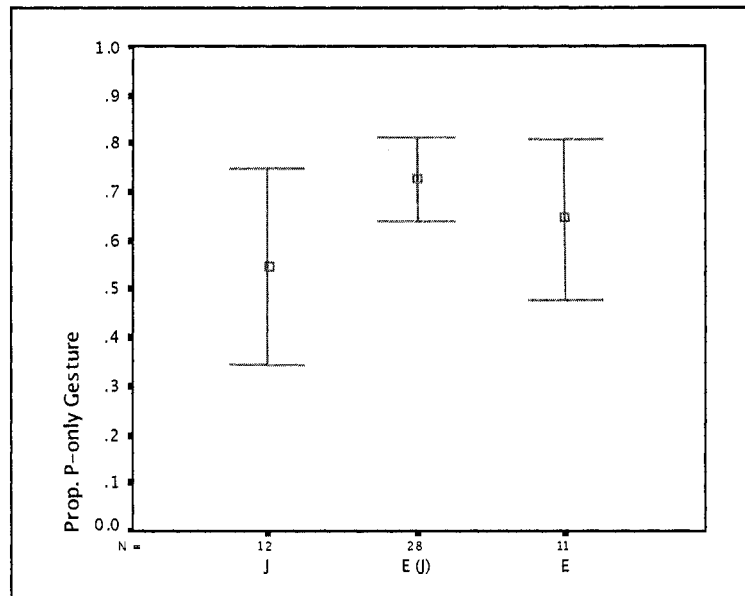


Figure 6.18: Mean proportion of Path-only gestures out of all motion gesture in event descriptions with both Manner and Path in speech in L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed no significant difference in mean proportion of Path-only gestures out of all motion gestures in event descriptions containing both Manner and Path in speech produced by the combined group of L2 speakers, monolingual English speakers, and monolingual Japanese speakers:  $\chi^2 (2, N=51) = 3.176, p = .204$ . Therefore, all groups produced comparable proportions of Path-only gestures.

Figure 6.19 shows an error bar plot illustrating use of Manner-Path conflated gestures in L2 and monolingual groups.

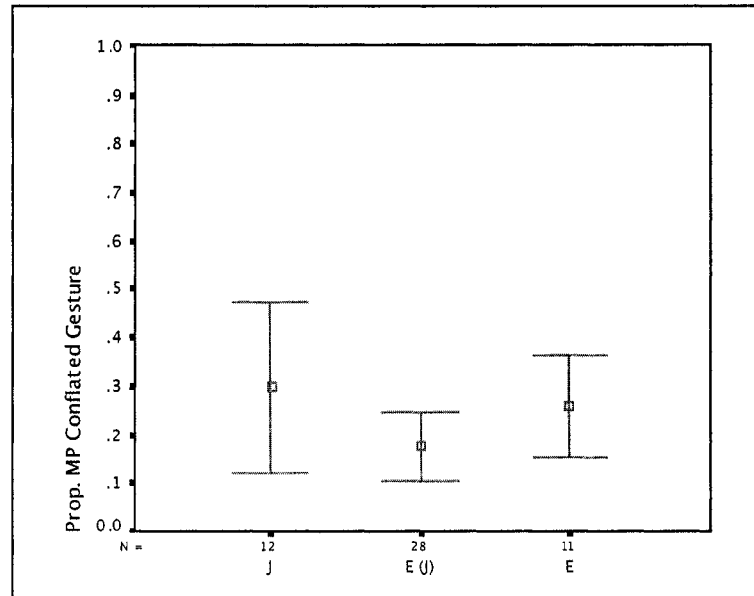


Figure 6.19: Mean proportion of Manner-Path gestures out of all motion gestures in event descriptions with both Manner and Path in speech in L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed no significant differences in mean proportion of Manner-Path conflated gestures out of all motion gestures in event descriptions containing both Manner and Path produced by the combined group of L2 speakers, monolingual English speakers, and monolingual Japanese speakers:  $\chi^2(2, N=51) = 2.758, p = .252$ . Therefore, all groups produced comparable proportions of Manner-Path gestures.

In summary, despite significant differences between L2 speakers and speakers of the target and source languages in clausal packaging, there were no parallel significant differences in gesture packaging. In other words, while L2 speakers did not appear to be entirely target-like in clausal packaging, they did appear to be target-like in gesture packaging. However, the interpretation of these results actually speaks less to

how target-like the learners were and more to the relationship between speech and gesture in this domain, an issue that will be addressed in the discussion.

On the other hand, there are noteworthy patterns. There were trends particularly in proportion of Path-only and Manner-Path gestures following differences found in speech. More specifically, L2 speakers appeared to produce more Path-only and fewer Manner-Path gestures than monolingual speakers of the target language, English, and monolingual speakers of the source language Japanese, a finding consistent with their preferences for multi-clause packaging of Manner and Path in speech.

#### **6.5.4.2 Perspective taking in L2 gesture**

Although perspective taking was not predicted to differ among the L1 groups considered here, findings revealed a robust monolingual baseline difference and a robust intra-language difference between monolingual and non-monolingual Japanese speakers. Therefore, it was also necessary to evaluate perspective taking in L2 gesture. Unlike in their L1, all native Japanese speakers with L2 English gestured in their event descriptions; therefore, all L2 participants are included here.

Table 6.13 illustrates the mean proportion of sagittal direction, enactment hand-shape and bi-manual gestures (all types: Manner-only, Path-only and Manner-Path) out of all motion gestures produced in event descriptions containing Manner and Path in speech in L2 and monolingual groups.



Table 6.13: Mean proportion (SD) of sagittal direction, enactment hand-shape and bi-manual gestures out of all motion gestures produced in event descriptions containing Manner and Path in speech in L2 and monolingual groups

	Mono Japanese (J) n=12	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L2 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=11
Sagittal	.67 (.43)	.27 (.37)	.27 (.35)	.24 (.32)
Enactment	.72 (.37)	.05 (.10)	.29 (.32)	.13 (.30)
Bi-manual	.50 (.40)	.49 (.38)	.29 (.30)	.16 (.30)

A Mann-Whitney  $U$  test indicated no significant difference between the two sub-groups of L2 speakers in proportion of sagittal gestures ( $z = -.124$ ,  $p = .901$ ) or bi-manual gestures ( $z = -1.439$ ,  $p = .150$ ). There was, however, a significant difference between groups in enactment hand-shape ( $z = -2.272$ ,  $p = .023$ ). Therefore, these two sub-groups were collapsed for analyses of direction and handedness, but not for hand-shape. Again, despite the high standard deviations noted above, neither L2 group exhibited a bimodal distribution in any of the dimensions.

Three separate analyses compared use of each dimension of perspective, specifically properties of character perspective. Figure 6.20 shows an error bar plot illustrating mean proportion of sagittal direction gestures out of all motion gestures in event descriptions with both Manner and Path in speech in L2 and monolingual groups.

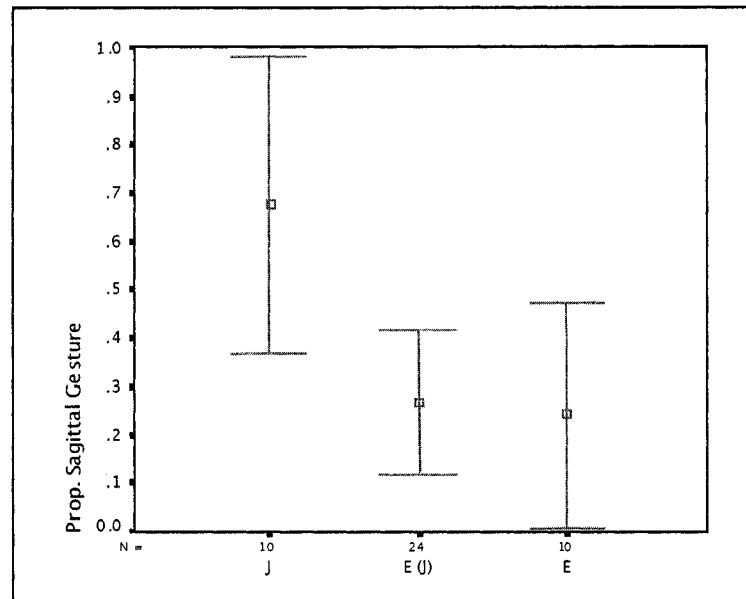


Figure 6.20: Mean proportion of sagittal direction gestures out of all motion gestures in event descriptions with both Manner and Path in speech in L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of sagittal direction gestures out of all motion gestures in event descriptions containing both Manner and Path in speech among groups:  $\chi^2(2, N=44) = 7.146, p = .028$ . Follow-up tests revealed no significant difference between the combined group of L2 speakers and monolingual speakers of the target language, English, but L2 speakers produced significantly fewer sagittal direction gestures than monolingual speakers of the source language, Japanese.

The second analysis in Figure 6.21 shows an error bar plot illustrating usage of enactment hand-shape gestures in L2 and monolingual groups. Due to the significant difference between learners resident in Japan and those resident in the US, these groups are presented separately.

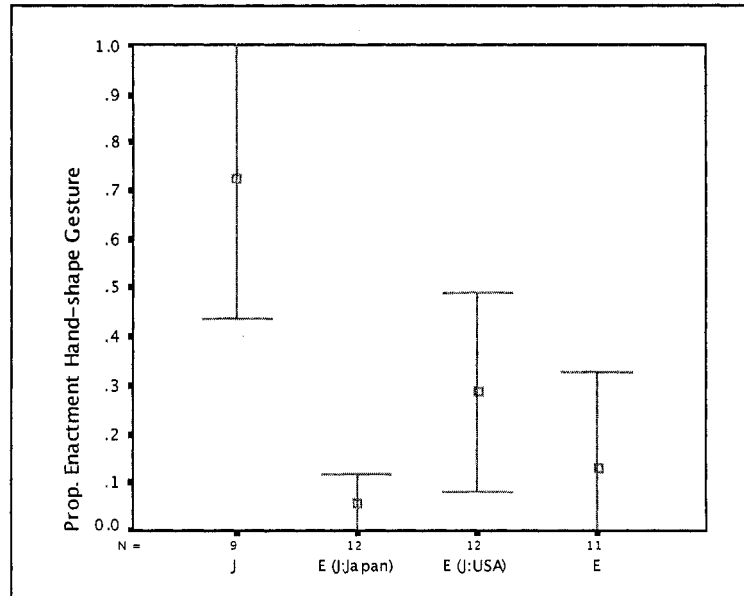


Figure 6.21: Mean proportion of gestures with enactment hand-shape out of all motion gestures in event descriptions with both Manner and Path in speech across L2 and monolingual groups: J, E (J, Japan), E (J, USA), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of gestures with enactment hand-shape out of all motion gestures in event descriptions containing both Manner and Path in speech among groups:  $\chi^2(3, N=44) = 17.867, p < .001$ . Even though L2 speakers resident in Japan produced significantly fewer gestures with an enactment hand-shape than their counterparts in the USA, follow-up tests revealed crucially that neither group of L2 speakers differed from monolingual English speakers. Furthermore, both groups of L2 speakers produced significantly fewer gestures with an enactment hand-shape than monolingual Japanese speakers. In other words, though they were different from each other, both groups of L2 speakers can somehow be considered ‘target-like’ as opposed to ‘source-like’.

The third analysis in Figure 6.22 shows an error bar plot illustrating usage of bi-manual gestures in L2 and monolingual groups. As the two sub-groups of L2 speakers did not differ from each other in this domain, they are collapsed once more.

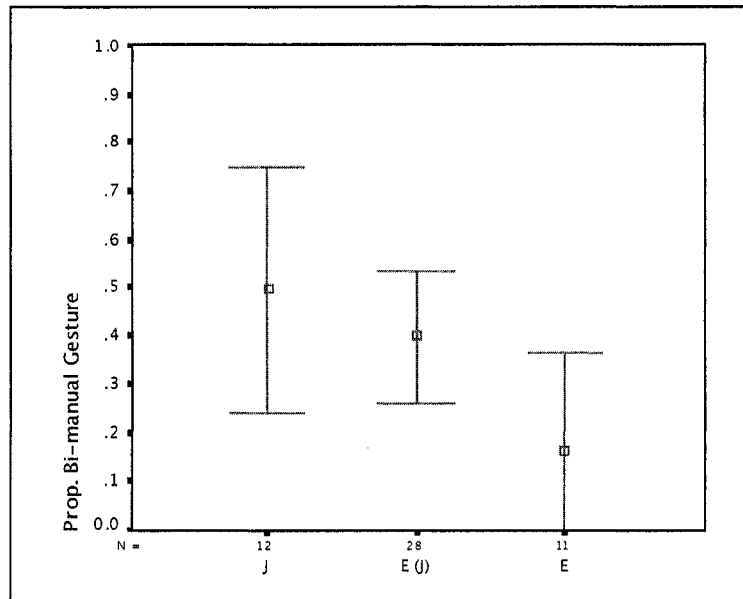


Figure 6.22: Mean proportion of bi-manual gestures out of total motion gestures in event descriptions with both Manner and Path in speech across L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed a marginally significant difference in mean proportion of bi-manual gestures out of all motion gestures in event descriptions containing both Manner and Path in speech among groups:  $\chi^2(2, N=44) = 5.523, p = .063$ . There was a trend consistent with the findings above such that the combined group of L2 speakers produced slightly more bi-manual gestures than monolingual English speakers, but fewer than monolingual Japanese speakers. Again, this particular analysis may have been affected by the distribution of the monolingual Japanese data, which was bimodal.

In order to compare L2 speakers' overall gesture perspective preference with that of the target and source language speakers, the proportion of gestures exhibiting character perspective in all of the dimensions was calculated. Table 6.14 provides mean proportion of gestures (all types: Manner, Path, Manner-Path) with 'full character perspective' (sagittal, enactment and/or bi-manual) out of all motion gestures in event descriptions containing Manner and Path in speech in L2 and monolingual groups.

Table 6.14: *Mean proportion (SD) of full character perspective (sagittal, enactment and bi-manual) gestures out of all motion gestures produced in event descriptions containing Manner and Path in speech in L2 and monolingual groups*

	Mono Japanese (J) n=11	L2 Non-mono Japanese Japan (E (J:Japan)) n=15	L2 Non-mono Japanese USA (E (J:USA)) n=13	Mono English (E) n=11
Full character perspective	.39 (.33)	.13 (.26)	.18 (.24)	.12 (.30)

A Mann-Whitney  $U$  test indicated no significant difference between the two sub-groups of L2 speakers in proportion of full character perspective gestures ( $z = -.936$ ,  $p = .349$ ). Therefore, these two sub-groups were collapsed.

Figure 6.23 shows an error bar plot illustrating mean proportion of full character perspective gestures out of all motion gestures in event descriptions with both Manner and Path in speech across L2 and monolingual groups.

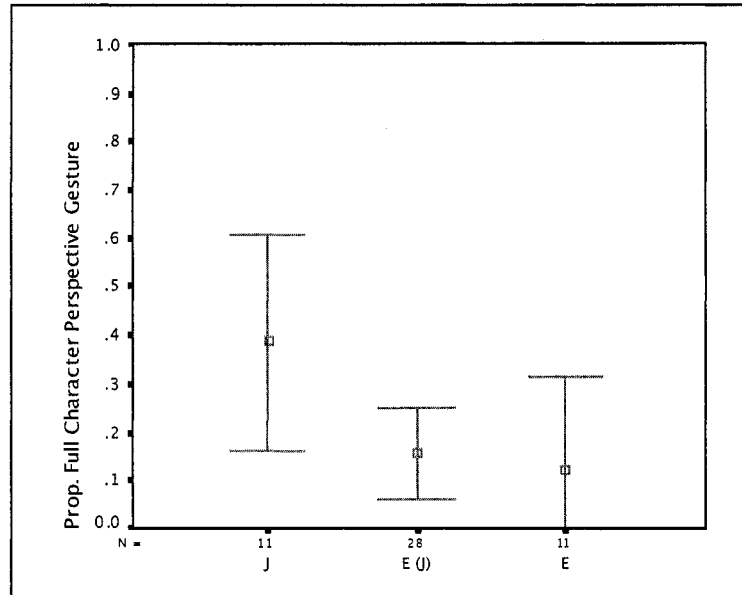


Figure 6.23: Mean proportion of full character perspective gestures out of all motion gestures in event descriptions with both Manner and Path in speech across L2 and monolingual groups: J, E (J), and E

A Kruskal-Wallis test showed a significant difference in mean proportion of full character perspective gestures out of all motion gestures in event descriptions containing both Manner and Path among groups:  $\chi^2 (2, N=50) = 8.185, p = .017$ . Follow-up tests revealed that the combined group of L2 speakers did not significantly differ from speakers of the target language, English, but produced significantly fewer full character perspective gestures than monolingual speakers of the source language, Japanese.

In summary, the analyses above revealed that L2 speakers did not differ significantly from monolingual English speakers in any domain of gesture perspective, but did significantly differ from monolingual Japanese speakers in almost all domains. Therefore, with respect to preferences for gesture perspective, L2 speakers were generally target-like as opposed to source-like.

### 6.5.5 Within-subject comparison of combined expression of Manner and Path in L1 and L2 speech and gesture

The final set of analyses in this chapter addresses the relationship between L1 and L2 production in speech and gesture within individuals, i.e. production from the native Japanese speakers with intermediate knowledge of English. These repeated-measures analyses were conducted using Wilcoxon tests, the results of which are summarized in Table 6.15 below with group means from the preceding analyses repeated for convenience. Since in only one preliminary analysis did the group of non-monolinguals in Japan differ from that in the USA in either their L1 or their L2, they have been combined into one non-monolingual group with a common L1 and L2 score for all analyses with the exception of enactment hand-shape in gesture.

Table 6.15: *Summary of within-subject L1 and L2 production in all speech and gesture analyses*

Analysis	Non-mono L1	Non-mono L2	Result
M-only clause	.11 (.14)	.19 (.20)	Non-significant difference: $z = -.917, p = .359$
P-only clause	.37 (.18)	.34 (.22)	Non-significant difference: $z = -.817, p = .414$
MP clause	.52 (.25)	.47 (.29)	Non-significant difference: $z = -.157, p = .875$
Encoding of both M and P in descriptions	.56 (.28)	.67 (.27)	Significant difference: $z = -2.090, p = .037$
M-only gesture	.05 (.08)	.10 (.13)	Significant difference: $z = -2.043, p = .041$
P-only gesture	.76 (.28)	.73 (.23)	Non-significant difference: $z = -.828, p = .408$
MP gesture	.19 (.26)	.18 (.18)	Non-significant difference: $z = -.245, p = .807$
Sagittal direction gesture	.19 (.24)	.27 (.35)	Non-significant difference: $z = -.158, p = .875$

Enactment hand-shape gesture	J (E:Japan) .38 (.45)	E (J, Japan) .05 (.10)	Marginally sig. difference: $z = -1.826, p = .068$
	J (E:USA) .14 (.22)	E (J, USA) .29 (.32)	Non-significant difference: $z = -1.524, p = .128$
Bi-manual gesture	.27 (.29)	.40 (.35)	Non-significant difference: $z = -1.604, p = .109$
Full character perspective gesture	.10 (.15)	.16 (.25)	Non-significant difference: $z = -.848, p = .396$

Differences between L1 and L2 production can be found in encoding of both Manner and Path in event descriptions. Despite possible lexical, syntactic, and processing constraints, native speakers of Japanese with knowledge of English were more explicit in their L2 than they were in their L1. As discussed in Chapter 5 and Appendix III, this may partly be explained by the coding of *noboru* ‘climb/ascend’. More specifically, in line with previous studies use of this verb in Japanese was coded as Path, which possibly resulted in a less frequent than average encoding of Manner for the climbing events. As these events comprised half of the stimulus set included in the analyses for this chapter, this may also have led to quantitative differences between L1 and L2 production for non-monolingual Japanese speakers.

A second slight difference between L1 and L2 production can be found in use of enactment hand-shape in gesture. Interestingly, non-monolingual Japanese speakers in Japan exhibited more enactment hand-shape in gesture when they performed in their L1 than in their L2. This is somewhat surprising considering that it is the reverse of the pattern seen in non-monolinguals resident in the USA, and perhaps the reverse of what one might expect. This difference will be addressed in the discussion section.



The third and final within-subject difference between L1 and L2 production concerns production of Manner only gestures. This may be explained by trends in clausal packaging in speech. Although not significant, there is a trend for a higher proportion of multiple clauses to express Manner and Path in L2 than in L1. In line with Kita and Özyürek (2003), this would predict a higher proportion of separate Manner and Path gestures in L2 and in L1. While we do not observe such a difference for Path gestures, the difference is there for Manner gestures. In any case, despite the difference in use of Manner-only gestures in L1 and L2 production, the proportion of these in comparison with Path-only and Manner-Path gestures is quite limited.

Overall, however, the results summarized above are quite surprising. Although these individuals are speaking completely different languages, L1 Japanese and L2 English, there are more similarities than differences in their L1 and L2 production. They exhibit similar preferences with respect to clausal packaging of Manner and Path in both languages, generally similar preferences for gestural packaging of Manner and Path and similar preferences for gesture perspective.

### 6.5.6 Summary of main findings in combined expression of Manner and Path

Table 6.16 summarizes all main findings from this chapter.

Table 6.16: *Summary of main findings in combined expression of Manner and Path*

Analyses	Findings
Clause packaging preferences	Counter to predictions, monolingual speakers of English and Japanese preferred mono-clause structures in packaging of Manner and Path. Non-monolingual Japanese speakers in L1 and L2 showed equal preference for mono- and multi-clause constructions.

Encoding of Manner and Path	Generally in line with predictions, monolingual speakers of English encoded both Manner and Path more often than non-monolingual speakers in L1 and L2 and monolingual Japanese speakers. Non-monolingual speakers in L2 encoded both Manner and Path more often than monolingual Japanese speakers.
Gesture packaging preferences	Counter to predictions, there were no differences in preferences for gesture packaging; therefore, all groups used the same proportion of Manner-only, Path-only and Manner-Path gestures.
Gesture perspective preferences	Counter to predictions, monolingual speakers of Japanese exhibited more character perspective in gesture than other groups. Non-monolingual speakers of Japanese in L1 and L2 did not differ from monolingual English speakers.

## 6.6 Discussion

This study investigated spoken and gestured combinations of Manner and Path in monolingual and non-monolingual discourse. Questions addressed were (1) how speakers packaged Manner and Path in speech: in single or across multiple clauses, (2) to what extent speakers explicitly mentioned both components in speech, (3) how speakers packaged Manner and Path in gesture: in single conflated or separate gestures, and (4) what perspective was favored in gesture: character or observer. In order to understand non-monolingual results, an understanding of monolingual patterns is necessary; therefore, these will be discussed first.

### 6.6.1 Monolingual combined expression of Manner and Path

Contrary to predictions, some unexpected similarities were found in the monolingual baseline. Monolingual Japanese and English speakers exhibited comparable preferences for single clauses combining Manner and Path, for example.

Monolingual Japanese speakers achieved this by encoding Manner in ways that did not syntactically constrain simultaneous expression of Path, i.e. compound verbs and complex motion predicates, but also Manner mimetics which function as adverbials within the clause. This difference contrasts with findings on verb-framed languages in general, but also contrasts with previous research on Japanese (cf. Allen et al., 2006; Kita & Özyürek, 2003).

There are several ways in which the discrepancy between findings here previous findings might be explained, all of which pertain to methodology. First, there may have been differences in clausal segmentation of speech. This study classified complex motion predicates as mono-clausal (e.g. *korogatte-iku* ‘rolling-go’) in line with Matsumoto (1991; 1996). However, there are other approaches one could take, and if such a predicate were split into two clauses, this would greatly affect patterns of information structure since these constructions are quite common. A second reason for the disparity could be the criteria for coding of Manner and Path itself, a perennial difficulty in motion studies.<sup>10</sup> In this study, the coding criteria were rather inclusive and took account of most of the possible ways in which speakers could encode Manner, giving speakers more opportunities, as it were, to be credited for mono-clausal expression of both components. Finally, the third reason could be the nature of the events used as stimuli. The stimuli used here elicited extended narrative descriptions.

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<sup>10</sup> The verb “fall” in English is treated in some studies as Manner and in some as Path. To date, there is no reliable test for identifying Manner and Path semantics and researchers rely on their own intuitions, standards in the literature, and/or possible combinatorial patterns as a guide.

However, different results would probably arise with shorter, focused descriptions such as those in Allen et al. (2006).<sup>11</sup>

Further unexpected similarities between monolingual English and Japanese speakers were the comparable patterns in gesture packaging. Both groups demonstrated comparable proportions of Manner-only, Path-only and Manner-Path conflated gestures. Contrary to findings on clausal packaging in speech, only about a third of motion gestures depicted Manner and Path together in the same stroke; the majority of gestures depicted Path only. This again contrasts with previous findings.

A possible reason for this stems from the climbing events. Manner gestures, either alone or in combination with Path, were relatively frequent in descriptions of Bowling Roll and Rope Swing, but not for the climbing events. If the Manner of *climbing* is a first-tier Manner verb and therefore significantly less salient than the Manners of *rolling* and *swinging*, one would expect it to be encoded in gesture less often. Such a phenomenon could have led to the higher than expected proportion of Path gestures overall.

Despite the similarities between monolingual speakers, there were also several differences. As expected, English speakers produced many examples of Manner and Path in a single clause in the context of a boundary crossing, i.e. Sylvester's rolling into the bowling alley. Japanese speakers, on the other hand, did not. As this boundary was both horizontal and did not involve any exertion on the part of the protagonist, having

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<sup>11</sup> Such an explanation is not affected by treatment of *noboru* 'climb/ascend'. For the analyses in this chapter, only event descriptions with both Manner and Path present in speech were included; therefore, all descriptions of climbing events included in analyses must have depicted Manner in an alternative way, e.g. *yoji-noboru* 'clamber-climb'.

been rolled along against his will by a bowling ball, these findings are entirely in line with Naigles et al. (1998). Furthermore, even though single clause structures were employed by a great many monolingual Japanese speakers, overall both Manner and Path were explicitly mentioned less often in their event descriptions than in monolingual English descriptions, a finding consistent with research on other verb-framed languages.

More interesting, however, was the unexpected difference in gesture perspective. Corresponding to previous findings in gesture, monolingual English speakers largely preferred observer perspective in gestures depicting motion. These gestures were lateral to the body, produced with a neutral hand-shape, and only employed one hand. Monolingual Japanese speakers, in contrast to previous findings, preferred various dimensions of character perspective, i.e. sagittal direction, enactment hand-shape, and bi-manual handedness, although the use of all of these dimensions at once was not the preferred option.

At this point, it is not entirely clear what prompted this perspective difference. Previous observations by McNeill (1992) based on unpublished findings from Church et al. (1989) suggested a robust relationship between transitivity, clause complexity, event saliency and gesture perspective. In other words, if transitive verbs are used in simple clauses to describe events central to a story line, accompanying gestures are more likely to take character perspective. While this is a useful explanation for intra-language differences, it is less useful for explaining crosslinguistic differences. More

specifically, there was little difference in the transitivity of verbs used, the complexity of clauses, and the centrality of the events described.

An alternative explanation may be found in the structure of the languages themselves. One obvious difference is the existence of mimetics in Japanese, but not in English. According to Kita (1997), the semantic representation of mimetics belong to an “*affecto-imagistic dimension* of meaning, in which language has direct contact with sensory, motor, and affective information” (Kita, 1997:380). They are highly experiential phrases, which “evoke a vivid at-the-scene feeling” (Kita, 1997:381). Moreover, Kita also discovered that mimetics were significantly more likely than verbs to attract representational co-speech gestures. From these findings, one might further predict that the representational co-speech gestures associated with such iconic lexical expressions would be similarly experiential, evoking vivid at-the-scene feelings, i.e. character perspective gestures. In this particular monolingual Japanese dataset, 50% of full character perspective gestures were produced with mimetics in the accompanying clause. This is not a majority; therefore, no strong conclusions can be drawn. However, we might speculate that general use of mimetics in the language may lead to a greater propensity in general for character perspective in gesture. Such a conjecture is analogous to the hypothesis that general biases towards Path versus Manner dimensions of a motion event, for example, may guide categorization of motion regardless of the specifics of prior linguistic encoding (Gennari, Sloman, Malt, & Fitch, 2002). This is a hypothesis that strongly assumes a substantial role for thinking for speaking over time (Slobin, 1996a), and a hypothesis which warrants further investigation. Alternative

hypotheses regarding crosslinguistic differences in gesture perspective, however, are discussed in Chapter 7.

Although the monolingual baseline in the domain of combined expression of Manner and Path in speech and gesture did not match all predictions, there were certainly sufficient areas in which monolingual and non-monolingual L1 and L2 production could be compared. We begin first with the L1 of native Japanese speakers with knowledge of English.

#### **6.6.2 Effects of the L2 on the L1 in combined expression of Manner and Path**

In general, non-monolingual speakers of Japanese seemed to produce both mono- and multi-clause constructions to express Manner and Path with roughly equal propensity, in contrast to both groups of monolingual speakers, who preferred monoclausal constructions. An explanation of this striking intra-language difference, may lie in the lexicalization of Manner. While monolingual speakers made notable use of Manner expressions that did not constrain Path expression within the same clause, non-monolingual speakers did not seem to apply the same lexical strategy, particularly with regard to mimetics. Instead, non-monolingual speakers employed a number of Manner main verbs. Such a lexicalization strategy might itself be a manifestation of influence of the L2 in that Manner is lexicalized in main verbs and not in mimetics in English. Therefore, the L1 of non-monolingual speakers of Japanese may have been influenced by the L2 in the mapping of semantic concepts onto morphosyntactic structures, which may have had ensuing implications for syntax, resulting in syntactic structures that did

not resemble the L2. This conclusion is supported by findings from Hohenstein, Eisenberg and Naigles (2006), whose analysis of Spanish-English bilinguals showed increased use of Manner main verbs as opposed to modifiers in the participants' L1, Spanish. The authors similarly concluded that this was a result of influence from the L2, English.

Related to the above finding are the issues of explicitness in discourse and gesture packaging. Although not a significant difference and not found in Hohenstein et al. (2006) for L1 Spanish, non-monolingual Japanese speakers exhibited a trend to encode both constituents of motion more often than monolingual Japanese speakers. With lexicalization of Manner in a main verb, English speakers are perhaps more sensitive to this property of motion and will thus encode it explicitly in event descriptions. Likewise, a similar lexicalization strategy among Japanese speakers with knowledge of English may have heightened sensitivity to Manner in general, making its explicit mention more likely in discourse, even at the expense of lengthier and more complex syntactic structures. In parallel, these more complex structures requiring multiple clauses may have led to separate packaging of Manner and Path in gesture, a trend that was also observed.

Finally, preferences for gesture perspective also appear to tie in to the reasoning above. Monolingual and non-monolingual Japanese speakers significantly differed in propensity to adopt character perspective. In this respect, Japanese speakers with knowledge of English more closely resembled monolingual English speakers. The lexical explanation for the monolingual baseline difference focusing on use of mimetics



outlined in 6.6.1 is strengthened by such an intra-language difference. In the non-monolingual Japanese dataset, 40% of full character perspective gestures were produced with mimetics in the accompanying clause, a result comparable to that above for monolingual Japanese discourse. However, we also saw that non-monolingual Japanese speakers relied less on mimetics as a syntactically non-constraining way to package Manner and Path in the same clause. Moreover, in Chapter 5, we observed an overall trend for less frequent use of mimetics by Japanese speakers with knowledge of English. Thus, if mimetics are generally less frequent in non-monolingual Japanese discourse, then character perspective may also be less frequent. Thus, influence of an L2 on an L1 in the mapping of semantic elements onto morphosyntactic resources, which brings about more complex multi-clause constructions in syntax, may also contribute to changes in gesture perspective. This reasoning would be in line with McNeill's (1992) argument that multiple clauses are correlated with observer perspective.

One possible alternative to the argument that changes in gesture perspective can be motivated by changes in the linguistics of the accompanying speech is the idea that gesture perspective is something that is culturally learned. Thus, those living in a Japanese environment will prefer character perspective in their gestures and those living in an American environment will prefer observer perspective in their gestures regardless of the language being spoken. The crucial evidence to counter this proposal is the comparison of non-monolingual speakers resident in Japan versus those resident in the USA. In no analysis of L1 gesture production did these groups differ. Although

non-monolingual speakers living in Japan did have some exposure to American culture though television, etc., it was vastly different in quantity and quality to that experienced by those who were immersed in the culture.<sup>12</sup> Thus, here we have rather strong evidence that changes in gesture perspective are at least not culturally motivated.

### **6.6.3 Effects of the L1 on the L2 in combined expression of Manner and Path**

Last, but not least, we come to the performance of native Japanese speakers with knowledge of English in their L2. From the analyses presented here, the results are generally predictable, with performance falling somewhere between the source and the target, except in the domain of syntactic packaging. Here, L2 speakers produced both mono- and multi-clause constructions to express Manner and Path with roughly equal propensity, instead of the mono-clausal constructions preferred by monolingual speakers of English and Japanese. Preferences for gesture packaging partially matched those for speech, with Manner and Path information frequently distributed across several gestures.

Explanations for clausal preferences may lie in transfer from the L1 or in processing. Of all the options for combining Manner and Path in Japanese, the only equivalents available in English involve complex motion predicates, comparison adverbials or separate clauses. The former two are syntactically rather complex, so a Japanese speaker of English may opt for separate clauses even though this differs from

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<sup>12</sup> Of course, residence in a country alone does not ensure immersion in the culture, but according to self-reported usage of English, the participants living in Boston were at least speaking English and not Japanese for a large part of their day.

preferences of the target group. An alternative explanation could be that isolation of Manner and Path in separate clauses is a general strategy to lighten processing load, a pattern consistent with the differentiation of semantic elements seen in L1 acquisition (Bowerman, 1982).

Furthermore, L2 speakers explicitly mentioned both components of motion more often than speakers of the source language (Japanese), but less often than monolingual speakers of the target language (English). Explanations for this could lie in transfer from the L1, but could equally lie in lexical, syntactic and/or processing constraints. In terms of gesture perspective, L2 speakers fully resembled monolingual speakers of the target language with a preference for observer perspective. Moreover, with respect to the dimension of hand-shape, learners in Japan looked even more like monolingual English speakers than learners in the USA. This is an additional piece of evidence against a cultural account of gesture perspective, which suggests an alternative linguistic explanation. Since there were no mimetics in L2 production, we may have more evidence for a link between mimetic use and character perspective in gesture. This and alternative hypotheses will be discussed in Chapter 7.

Finally, in a within-subject comparison, native Japanese speakers with knowledge of English appeared remarkably similar in their L1 and L2. Similar preferences for clause packaging, gesture packaging (with the exception of Manner gestures) and gesture perspective were observed, and the greatest difference was found in explicitness, which might have arisen as an artifact of coding.

## 6.7 Conclusion

As stated previously, expression of Manner and Path are not independent of one another. Lexicalization of one affects lexicalization of the other. This chapter has investigated this interdependence from a crosslinguistic perspective in order to examine the nature of possible interactions between language systems within individuals who know a second and typologically different language.

Findings from this chapter support those presented in preceding chapters and suggest that in addition to effects of an established language on an emerging language, an emerging language can exert a subtle influence of its own, especially in the domain of the lexicon, which may have repercussions for the domains of syntax and gesture. Implications of this phenomenon for theories of second language acquisition will be discussed more fully in Chapter 7.

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## **Chapter 7: General Discussion**

### **7.1 Overview**

In the field of SLA, the relationship between the L1 and the L2 in the mind of a learner has traditionally been viewed from a unidirectional perspective. Thus, in addition to other factors shaping a second language, the L2 system has largely been characterized in terms of the L1. Studies that have examined whether aspects of the L1 system can be characterized in terms of the L2 have primarily done so in populations of functional bilinguals. Furthermore, since these populations are often living in the L2 speech community at the time of observation and since much research employs error-based analyses, differences observed in the L1 may be interpreted as signaling initial stages of language loss. The few alternative studies that have looked at lower proficiency learners using non-error based analyses have primarily focused on school-age children with the objective of assessing the effects of learning a second language on a not yet mature L1. Moreover, by failing to systematically compare the L1 and L2 of the same speakers, little research that has examined effects of an L2 on an L1 has simultaneously taken L2 production into account. Therefore, we do not yet have a clear picture of how linguistic systems within an individual learner might interact.

This thesis attempts to redress the imbalance described above. Thus, in examining crosslinguistic influence in construal of motion events, three specific questions were posed: 1) Can an emerging L2 influence an established L1? 2) If so, how is such influence realized? 3) Within the same group of speakers, are there parallel

influences of the L1 on the L2? These questions were posed with the broader goal of characterizing the relationship between linguistic systems in the multilingual mind.

These research questions were investigated in three separate studies. Chapter 4 investigated expression of Path, focusing on lexicalization patterns in speech (i.e. mapping of semantic elements onto morphosyntactic devices) with consequent effects for alignment of gesture to speech, and encoding patterns in speech and gesture (i.e. extent of explicit reference to Path in speech and gesture). Chapter 5 investigated expression of Manner, focusing on lexicalization patterns in speech and encoding patterns in speech and gesture. Finally, Chapter 6 investigated combined expression of Manner and Path, focusing on packaging of Manner and Path in speech and gesture (i.e. within and across clauses and gestures, as well as gesture perspective) and encoding patterns. Overall, results suggest the existence of crosslinguistic influence in both directions, crucially in many of the same linguistic domains, which may be taken as evidence for convergence between the established L1 and emerging L2 in the minds of intermediate level language learners.

This chapter summarizes and discusses findings in each of the three studies that show independence of L1 and L2 linguistic systems as well as findings relevant for both sides of the issue of crosslinguistic influence (i.e. L2 influence on L1 and L1 influence on L2). These findings are then illustrated through a crosslinguistic profile of the multilingual speaker and interpreted in terms of whether and how they speak to the issue of interaction between linguistic systems within an individual mind. Implications of the findings, both theoretical and methodological, are outlined in the subsequent



section, followed by a discussion of limitations of the thesis and suggestions for further research.

## **7.2 Summary and discussion of findings**

### **7.2.1 Independence of the non-monolingual L1**

As expected, motion event construal in non-monolingual Japanese L1 discourse resembled that in monolingual Japanese discourse in several ways. With regard to expression of Path in speech and gesture, Chapter 4 showed that native speakers of Japanese with knowledge of English in their L1 employed just as many verbs to express Path in their L1 as monolingual speakers of Japanese. Furthermore, both groups of Japanese speakers, non-monolingual and monolingual, exhibited similar alignment patterns of Path gesture to speech, and in both groups, degree of concatenation of Path in speech did not affect degree of concatenation of Path in gesture.

Concerning the expression of Manner in speech and gesture examined in Chapter 5, non-monolingual and monolingual Japanese speakers lexicalized Manner in a comparably wide range of verbs and adverbials. Furthermore, both groups exhibited instances of Manner fog in gesture, although this seemed to be slightly more frequent in monolingual discourse. Similarly, the groups did not significantly differ in Manner encoding and encoding of combined Manner and Path, although this seemed to be slightly more frequent in non-monolingual discourse.

Finally, both groups exhibited comparable patterns in gesture packaging for combined expression of Manner and Path, as shown in Chapter 6. Non-monolingual

Japanese speakers produced the same proportion of Manner-only, Path-only and Manner-Path conflated gestures in their L1 as monolingual speakers of Japanese, although again there appeared to be a tendency for non-monolingual Japanese speakers to exhibit more separation in gesture for combined expression of Manner and Path.

### **7.2.2 Effects on the non-monolingual L1**

Investigating the possibility of influence of an L2 on the L1 at this intermediate level of L2 proficiency was a much more exploratory endeavor than following the traditional line of enquiry in the reverse direction. We expected that, if this phenomenon existed at all, it would be very subtle and possibly reflected in general trends. Contrary to these expectations, a number of rather robust patterns suggesting crosslinguistic influence in the non-monolingual L1 were found. In summary, possible influence of the L2 was observed at the linguistic level of lexicalization patterns, with subsequent effects manifest in syntax and also in gesture. Since constraints on vocabulary knowledge and processing *in the L1* should not affect findings on lexicalization patterns, clausal characteristics and extent of encoding, these phenomena may be interpreted as evidence of L2 thinking for L1 speaking along Slobinian lines (Slobin, 1996a).

With reference to expression of Path investigated in Chapter 4, we saw that the morphosyntactic resources to express Path most closely resembling those preferred in monolingual English production, i.e. adverbial expressions, were employed in a significantly greater number in non-monolingual L1 Japanese than in monolingual

Japanese discourse. The effects of this phenomenon were clearly observable in increased adverbial encoding of information about Goal of motion as well as in the consequent weight of Path expression within the clause, i.e. significantly more Path expressions present in the clauses of non-monolingual L1 Japanese discourse than present in discourse from either monolingual group.

Chapter 5 on expression of Manner described trends in lexicalization that were not statistically significant, but potentially revealing nonetheless. Here, non-monolingual Japanese speakers appeared to encode Manner in mimetics slightly less often than their monolingual Japanese counterparts. This was interpreted as possible evidence of crosslinguistic influence since mimetics do not form a lexical category in English. Further analyses presented in Chapter 6 outlined potential differences in the type of Manner verbs used, i.e. syntactically constraining or not, such that there appeared to be a preference for Manner verbs used as main verbs as opposed to compound verbs or complex predicates among non-monolingual speakers of Japanese. Since this was also the pattern seen in monolingual English discourse, this trend might be interpreted as an effect of the L2.

Observations regarding independent lexicalization of Manner and Path may have prompted the robust effect in combined expression of Manner and Path at the level of the clause as shown in Chapter 6. Here we saw that non-monolingual speakers of Japanese exhibited significantly more multi-clause constructions for Manner-Path packaging than both groups of monolinguals, whose predominant pattern was monoclausal. It was argued that this pattern might be explained if transfer from English had

led to a shift away from non-constraining morphosyntactic devices for Manner encoding towards more constraining devices (i.e. finite verbs), which would limit simultaneous expression of Path within the same clause. Clause-packaging preferences may also explain the slight trend for greater separation of Manner and Path in different gesture strokes among non-monolingual speakers of Japanese noted in the previous section (7.2.1).

An additional effect of differences in lexicalization may have prompted corresponding differences in gesture perspective between monolingual and non-monolingual Japanese speakers. Chapter 6 provided evidence for a monolingual baseline difference in the perspective from which gestures were produced. Frequent use of character perspective, with the associated properties of sagittal direction, bimanuality and enactment hand-shape, was seen among monolingual speakers of Japanese versus a clear predominance for observer perspective, with the properties of lateral direction, one-handedness, and neutral hand-shape, among monolingual speakers of English. In their L1, however, non-monolingual speakers of Japanese differed from their monolingual Japanese counterparts, generally patterning in line with monolingual English speakers. Moreover, this robust difference was exhibited both by the non-monolinguals resident in Japan as well as those in the USA, suggesting that results could not be explained by simple cultural exposure. Instead, a linguistic hypothesis was proposed whereby less frequent use of highly sensory mimetics either in the accompanying clause or in wider discourse might have caused the less frequent adoption of highly sensory character perspective in gesture.

Finally, the trends for greater encoding of Manner and combined encoding of Manner and Path among non-monolingual Japanese speakers mentioned in the previous section (7.2.1), which approximated monolingual English production, relate to the robust difference in the use of gesture to moderate Manner information described in Chapter 5. Non-monolingual speakers of Japanese exhibited significantly more instances of encoding of Manner in speech, but corresponding encoding of only Path in gesture. In this way, non-monolingual Japanese speakers' gestures appeared to 'downplay' Manner information in speech, a pattern that was frequently seen in monolingual English discourse. In parallel, as noted in the previous section (7.2.1), non-monolingual Japanese speakers appeared to exhibit a trend for less use of Manner fog in gesture, i.e. encoding of Manner in gesture when there was no encoding of Manner in speech. Overall, use of Manner gesture in the L1 of native Japanese speakers with knowledge of English seemed to reflect a shift in nature from substitution to modulation.

### **7.2.3 Summary of non-monolingual L1 production**

In sum, a comparison of non-monolingual production in L1 Japanese and monolingual production in Japanese revealed several similarities, but many more differences. Differences in lexicalization patterns appeared to lead to subsequent differences in the semantic and syntactic characteristics of the clause as well as possible effects on the makeup of accompanying gestures. With the focus here on L1 data, we conclude that these results cannot be explained from the perspective of lexical or

processing difficulties. Instead, we posit that these phenomena may be indicative of L2 thinking for L1 speaking. Thus, we suggest that knowledge of one language can affect patterns in another, but in this rather novel case, emerging patterns affect established ones. We turn now to the native Japanese speakers' production in their L2.

#### **7.2.4 Independence of the L2**

This thesis described several domains in construal of motion events where L2 speakers demonstrated learning as evidenced by target-like performance. These included lexicalization of Manner, as shown in Chapter 5. In this area, L2 speakers of English were indistinguishable from monolingual speakers of English, at least in terms of the morphosyntactic devices used to encode Manner, although there were some differences in the actual lexical items used. Such learning might be explained in a couple of different ways. First, Manner verbs are ubiquitous in English, and therefore possibly salient in the input learners receive. Moreover, use of such morphosyntactic devices would not be completely alien to these learners since verbs are also used to a very high degree to encode Manner in their L1, Japanese, although to a slightly lesser extent than in English. Parallel to this is the issue of mimetics. While mimetics were not the preferred way to encode Manner in Japanese, they were relatively frequent in the corpus. However, Japanese learners of English would have found it very difficult if not impossible to transfer use of mimetics to express Manner from their L1 to their L2 because that lexical category is not productively part of English, and therefore does not

appear in English language education.<sup>1</sup> Here, we may have evidence of the impact of psychotypology (Kellerman, 1979), in that learners perceived and were wary of possible lexicalization differences between languages, particularly in the area of more idiomatic expressions such as mimetics.

Another area where learners appeared target-like was in gesture perspective, as shown in Chapter 6. This is an interesting finding, which lends support to the proposed hypothesis that there may be a relationship between Manner mimetics in Japanese and use of character perspective in gesture. Discussed above with reference to encoding of Manner is the fact that mimetics did not feature at all in L2 production. If character perspective in gesture really were motivated to some extent by the existence of mimetics in the accompanying speech, as hypothesized in Chapter 6, then the absence of this feature in L2 speech would fully predict its absence in gesture or at least preference for an alternative and possibly default perspective, i.e. observer perspective.

It should be noted here that this discussion refers particularly to results on use of full character perspective. In general, results regarding use of full character perspective mirrored results on use of the individual components of character perspective: sagittal direction and bi-manuality, with the exception of enactment hand-shape. Here we saw that learners in the USA appeared to employ more enactment hand-shape gestures than learners in Japan, although neither group significantly differed from monolingual English speakers. There is no clear reason for this. Although transfer from the L1 is

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<sup>1</sup> Of course, there are onomatopoeic expressions in practically every language, but these are nowhere near as productive or as fully lexicalized in English as they are in Japanese. As an ex-teacher of English, I can say that onomatopoeics were never included in any textbooks I or my colleagues used, with the very limited exception of animal noises in ESL texts for children.

potentially an explanation, it seems rather unlikely that such transfer would be restricted to only one dimension of gesture perspective and to only one group of learners, particularly the group resident in the L2 community. An alternative and perhaps more likely explanation is that of lexical difficulty. Learners may have recruited the dimension of hand-shape to reinforce the intended meaning of accompanying utterances containing specific lexical items that they may not have been entirely sure of. This would be especially relevant for expression of Manner, where finding appropriate lexical items is undoubtedly challenging and where manipulations of hand-shape to indicate the instrument used by the protagonist might prove particularly useful. Such an explanation is supported by the fact that the learners resident in the USA were on average slightly less proficient than those in Japan.

A final area where learners appeared target-like in the domain of motion event construal was in the relationship between concatenation of Path in speech and in gesture. However, as discussed in Chapter 4, this may not be entirely reflective of learning in the L2. In general, findings regarding concatenation of Path suggest that the relationship between speech and gesture is not as straightforward as has been predicted, i.e. that concatenation of Path in speech leads to concatenation of Path in gesture (cf. McNeill, 1997; Stam, 2006). Therefore, even if L2 speakers exhibited patterns similar to speakers of the target language, we cannot be sure that those patterns arose for the same reasons if we do not have a full understanding of what those reasons might be. This issue will be discussed in more depth in section 7.4 regarding implications of this thesis.



### 7.2.5 Effects on the L2

In contrast to the above, there were numerous aspects of motion event construal in the L2 where speakers did not appear target-like. Analyses of these areas indicate that the domain of motion event construal is, as predicted, no different from many domains in that there is evidence to suggest influence of the L1 on the L2. In general, this influence can be seen at the linguistic level of lexicalization patterns, with effects manifest in discourse such that components of a motion event are more or less encoded in speech and gesture. Effects on encoding may be interpreted as evidence for L1 thinking for L2 speaking in Slobinian terms, but we must treat such a conclusion with caution, as it is unclear to what extent constraints on vocabulary knowledge and processing in the L2 contributed to findings on encoding, and indeed lexicalization patterns themselves for that matter.

In terms of expression of Path in speech, Chapter 4 showed that L2 speakers of English encoded Path verbs to a higher degree than monolingual speakers of English. This was frequently in the form of light Path verbs such as *go*, which might reflect translation of the Japanese equivalent *iku*, but might equally reflect more general learner-specific preferences for light verbs. However, there were also telling examples of adverbials transformed into verbs, resulting in an outcome resembling monolingual Japanese production. Furthermore, learners encoded Goal of motion in adverbials significantly more often than monolingual English speakers, a finding that was also observed in monolingual Japanese production. On the other hand, in global encoding of Goal (combining verbs and adverbials), also shown in Chapter 4, learners looked

neither target-like nor source-like. Here, a significantly higher number of morphosyntactic resources lexicalizing Path explicitly referred to the Goal of motion in L2 discourse as compared with monolingual discourse in either English or Japanese. This finding will be discussed in section 7.3 regarding the interaction between languages within an individual mind.

With respect to expression of Manner in speech, we saw from Chapter 5 that L2 speakers encoded Manner less often than monolingual speakers of English at both the clause and discourse levels. This might have resulted from a process of thinking-for-speaking in the L1, which predicts that if Manner is less 'codable' and 'processable', it is less likely to be explicitly mentioned (cf. Slobin, 2004). Given that monolingual speakers of Japanese habitually encode Manner less often than monolingual speakers of English, and that such a pattern may give rise to differential attention to Manner or at least different rhetorical styles with reference to encoding of Manner, these habits may influence production in an acquired L2. Transfer of rhetorical style may also explain the findings in Chapter 6 on expression of Manner and Path, where both components were encoded less often in L2 production than in monolingual English production, although more often than in monolingual Japanese production.

An alternative explanation is that degree of Manner encoding in L2 may have been driven by a lack of knowledge of particular lexical items. However, even if lexical knowledge did play a role, it did not constrain production to the extent that speakers encoded the semantic components of Manner and Path in their L2 less often than all other groups, as one might have expected. In reality, though, without testing learners'

vocabulary knowledge, we cannot fully explain the L2 performance observed here, i.e. whether patterns arose from transfer of rhetorical style or from lack of vocabulary knowledge.

Concerning combinations of Manner and Path in speech, Chapter 6 revealed non-target-like clause-packaging preferences, i.e. mixed use of mono- and multi-clause structures as opposed to the mono-clause structures favored by monolingual speakers of English. Superficially, this may not look like crosslinguistic influence, as the monolingual Japanese speakers in this study did not exhibit such a preference either. However, other studies have shown the multi-clause frame to be the preferred option in Japanese, particularly in cases where both Manner and Path are salient (cf. Allen, Özyürek, Kita, Brown, Furman, Ishizuka, & Fujii 2006; Kita & Özyürek, 2003). Furthermore, of the various ways to combine expression of Manner and Path in Japanese, for example use of compound verbs, the only one easily transferable to English is the multi-clause frame, with Manner in one clause and Path in the other. The equivalent of complex motion predicates in Japanese could technically be used in English, yielding main verbs with associated adverbial phrases, but this option is syntactically more complex than having Manner and Path both encoded in finite verbs. Thus, preference for a multi-clause frame in Japanese in some contexts and its availability in English may have prompted transfer of the structure to the L2 in this context. Alternatively, the presence of multiple clauses in L2 discourse could simply have reflected the greater ease with which such a syntactic structure can be processed, i.e. a general learner strategy of differentiation of semantic elements also seen in L1

acquisition (cf. Bowerman, 1982). Only data from another source language could help to tease apart a transfer account from a processing account of clause-packaging preferences in L2 construal of motion events.

Regarding expression of motion in gesture, several non-target-like patterns were observed. Chapter 4 revealed that a significantly lower proportion of Path gestures were aligned with Path adverbials in L2 production in English as compared to monolingual English production, though this was a pattern akin to monolingual Japanese production. Furthermore, when learners encoded Manner in speech, they were more likely than monolingual English speakers also to encode it in gesture, yielding more semantic overlap between speech and gesture. This pattern bore some resemblance to the semantically overlapping gestures of monolingual Japanese speakers, whose Manner encoding in speech was frequently accompanied by gestures depicting Manner. However, whether these gestures were redundant, particularly in the L2, is questionable. Learners may have faced lexical challenges in expression of Manner in the L2 and may have used gesture semi-strategically to support their spoken descriptions. Under these circumstances, the pattern is less likely to have been caused by crosslinguistic influence.

However, before rejecting a transfer explanation in the area of Manner gesture, one must also consider the phenomenon of “Manner fog” (McNeill, 1997). Gesturing about Manner in its absence in speech was certainly not as robust a pattern for monolingual Japanese speakers as the literature popularizing McNeill’s original observations for Spanish would suggest, but a slight crosslinguistic difference was

present. The concept of the gestural Manner fog was proposed to show how speakers of verb-framed languages could distribute semantic information across both modalities to offset structural difficulties in expression of Manner in speech. Therefore, gestures exhibiting these properties in monolingual Japanese discourse can be interpreted as strategic gestures in McNeill's terms. L2 learners did not exhibit the phenomenon of Manner fog, but if they used partially strategic Manner gestures to bolster lexical choices expressing Manner, then we may perhaps interpret this as transfer at least of *strategy*. Such findings would be analogous to Gullberg's statement that "strategic gestures in L2 production are complementary significantly more often than they are substitutive" (1998:165). However, in this case, not only did L2 gestures occur with speech as opposed to in place of it, but they also exhibited greater semantic overlap with accompanying utterances than would normally be seen in target production.

#### **7.2.6 Summary of L2 production**

To conclude this section, while learners appeared target-like in several areas, there does appear to be evidence, from a range of findings, that the L1 influences the L2 in motion event construal in the domain of lexicalization patterns. This should be distinguished from other more typical types of transfer at the purely lexical level, such as calques. Lexicalization is essentially at the interface between morphosyntax and semantics, and evidence of crosslinguistic influence here supports other findings generally in this area such as subcategorization frames (cf. Montrul, 2001). Furthermore, influence at this interface level may have repercussions at the level of

discourse, which are manifested in differing levels of encoding in speech and gesture. Such an effect on discourse is generally in line with von Steyvers's (2003) findings on narrative framing. There, English learners of German tended to employ a more analytic framing of events, in comparison to the holistic framing employed by native German speakers. This was argued to be due to less frequent encoding of endpoints of motion arising from the importance of progressive aspect in English. And clearly the monolingual speakers of English observed here encoded Goal the least frequently of all groups, as predicted by von Steyvers's findings. However, findings also diverge from von Steyvers's to some extent. Japanese learners of English encoded endpoints or Goals in a combination of verbs and adverbials in their L2 more often than monolingual speakers of both the source and target languages, an observation which undermines a theory of transfer in this area.

### **7.3 Relationship between linguistic systems in the learner's mind**

Thus far, we have focused on characteristics of L2 production that appear to have been influenced by L1 production as well as the reverse and less studied case, characteristics of L1 production that appear to have been influenced by L2 production. However, these conclusions for non-monolingual production have been drawn solely on the basis of comparisons with monolingual speakers of each language. It is perhaps obvious at this point that to label these phenomena as "transfer" or even "crosslinguistic influence" is not entirely accurate, one reason being that such a conclusion has only been drawn with the indirect evidence resulting from having

compared different groups of speakers. To obtain a potentially more accurate picture of crosslinguistic influence, one needs to compare language production within individuals, i.e. how one's own production in the first language might affect one's own production in the second language and vice versa. Rather surprisingly, this methodological control has very rarely been adopted in studies on crosslinguistic influence, which more often than not rely on the indirect evidence that comes with comparing, for example, second language speakers to *other* speakers of the source language.<sup>2</sup> Moreover, by conducting within-subject comparisons in L1 and L2 production, we simultaneously tackle our objective of understanding the nature of interactions between linguistic systems within an individual mind.

### 7.3.1 Profile of the second language learner in L1 and L2

The results summarized above largely deal with the semantic components of motion independently of one another. However, such treatment obscures the fact that these components do work together when speakers talk about motion. The examples below attempt to put Manner and Path back together in their rightful place by illustrating what non-monolingual speakers actually say and do in their L1 and L2 when they describe motion events.

The example in (1) shows production from the same individual in both Japanese and English describing the Rope Swing event. Manner and Path components are

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<sup>2</sup> See Stam (2006) as an exception to this.

underlined and representational gesture strokes are highlighted in bold. This example illustrates the following features of non-monolingual production.

Speech:

- Lexicalization of Path in verbs and adverbials in L1 and L2
- Concatenation of Path expression within the clause in L1 and L2
- Encoding of Goal information in L1 and L2
- Lexicalization of Manner in comparison adverbial in L1 and verb in L2
- Full encoding of Manner and Path in event descriptions in L1 and L2.
- Use of single and multiple clauses to combine Manner and Path in L2

Gesture

- Alignment of Path gesture with motion verb and Path adverbial in L2
- Some degree of concatenation of Path gesture within clause in L2
- Mixed use of gesture perspective in L1 and L2, with greater use of enactment hand-shapes
- Mixed preference for gesture packaging - Path-only in L2, Manner-Path in L1
- Manner 'downplay' in gesture – Path-only gesture used in clause with Manner information in speech in L2



(1) L1 [taazan-no-youni kare-no **heya-kara**<sup>1</sup> me-no mae-no  
 Tarzan-Gen-like he-Gen room-from eye-Gen front-Gen  
 sono kiroi tori-no heya-he utsurouto<sup>2</sup>-  
 that yellow bird-Gen room-to try.to.move  
 shimasu]

-do

[sore-de kou taazan-no-youni **ikun-desukedo**<sup>3</sup>]  
 then-and like Tarzan-Gen-like go-Cop.but

Lit: '(He) tries to move from his room to that yellow bird's room in front of his eyes like Tarzan. And then he goes like Tarzan.'

<sup>1st</sup> Manner-Path gesture: Manner depicted in arc shape, Path depicted in trajectory. Gesture is one-handed, lateral, with neutral hand-shape. Aligned with Ground noun and Path adverbial. Full semantic overlap between gesture and speech (i.e. Manner and Path in clause, Manner and Path in gesture).

<sup>2nd</sup> Manner-Path gesture: Manner depicted in arc shape, Path depicted in trajectory. Gesture is one-handed, unclear direction, with enactment hand-shape. Aligned with Path verb. Full semantic overlap between gesture and speech (i.e. Manner and Path in clause, Manner and Path in gesture).

<sup>3rd</sup> Manner-Path gesture: Manner depicted in arc shape, Path depicted in trajectory. Gesture is bi-manual, sagittal, with enactment hand-shape.

Aligned with Path verb. Full semantic overlap between gesture and speech (i.e. Manner and Path in clause, Manner and Path in gesture).

**L2** [*and then jum jump outside<sup>1</sup> from the window]*

[*and then tried<sup>2</sup> he tried<sup>3</sup> to reach to<sup>4</sup> birdcage<sup>5</sup> in front of building]*

<sup>1st</sup> Path-only gesture: Path depicted in trajectory (no arc-shape depicting Manner). Gesture is bi-manual, sagittal, with enactment hand-shape. Aligned with Manner verb and Path adverbial. Partial semantic overlap between gesture and speech (i.e. Manner and Path in clause, Path in gesture).

<sup>2nd</sup> Strategic Manner-Path gesture: performance features signaling disfluency - unfilled pause, repetition. Gesture excluded from analyses.

<sup>3rd</sup> Strategic Manner-Path gesture: performance features signaling disfluency - unfilled pause, repetition. Gesture excluded from analyses.

<sup>4th</sup> Path-only gesture: Path depicted in trajectory (no arc-shape depicting Manner). Gesture is bi-manual, sagittal, with enactment hand-shape. Aligned with Path verb and Path adverbial. Full semantic overlap between gesture and speech (i.e. Path in clause, Path in gesture).

<sup>5th</sup> Path-only gesture: Path depicted in trajectory. Gesture is one-handed, lateral, with neutral hand-shape. Aligned with Goal noun. Full semantic overlap between gesture and speech (i.e. Path in clause, Path in gesture).

The example in (2) shows production from another individual in both Japanese and English describing the Bowling Roll event. Manner and Path components are

underlined and representational gesture strokes are highlighted in bold. This example illustrates the features of non-monolingual production listed below. A further aspect to notice about example (2) is the similarity of production in L1 and L2, in terms of lexical items and constructions.

Speech:

- Lexicalization of Path in verbs and adverbials in L1 and L2
- Concatenation of Path expression within the clause in L1 and L2
- Encoding of Goal information in L1 and L2
- Lexicalization of Manner in main verb (syntactically constraining in Japanese) in L1 and L2
- Full encoding of Manner and Path in event descriptions in L1 and L2.
- Use of multiple clauses to express Manner and Path in L1 and multiple and single clauses in L2

Gesture

- Alignment of Path gesture with Path verb in L1, motion verb and Path adverbial in L2
- Some degree of concatenation of Path gesture within clause in L2
- Mixed use of gesture perspective in L1 and L2, with greater use of enactment hand-shapes
- Semantic packaging in separate (Path-only) gestures in L1 and L2
- Manner ‘downplay’ in gesture – Path-only gesture used in clause with Manner information in speech in L2

- (2) L1 [*sonomama korokoro korogatte*]  
 in.that.way roundMim roll.Con  
 [*bouringu jyou-ni itte<sup>1</sup>*]  
 bowling alley-to go.Con

Lit: '(He) rolls ROUND like that. (He) goes to the bowling alley'

<sup>1st</sup> Path-only gesture: Path depicted in trajectory. Gesture is bi-manual and sagittal. Aligned with Path verb. Full semantic overlap between gesture and speech (i.e. Path in clause, Path in gesture).

- L2 [*and ah um running to the<sup>1</sup> ah road<sup>2</sup>*]  
 [*so go to the bowling space bowling center*]

<sup>1st</sup> Path-only gesture: Path depicted in trajectory. Gesture is bi-manual and lateral. Aligned with Manner verb and Path adverbial (and article). Partial semantic overlap between gesture and speech (i.e. Manner and Path in clause, Path in gesture).

<sup>2nd</sup> Path-only gesture: Path depicted in trajectory. Gesture is bi-manual and lateral. Aligned with Goal or Ground noun. Partial semantic overlap between gesture and speech (i.e. Manner and Path in clause, Path in gesture).

It is noteworthy that not all speakers exhibited all of the properties of crosslinguistic influence described in this thesis. The examples above illustrate differences between the speakers, and neither speaker exhibited Manner 'downplay' in gesture in their L1, only in their L2. Of course, many other speakers did exhibit this

feature in their L1, but perhaps not other features demonstrated above. Here we see the not unexpected effects of individual differences, which group summaries often conceal. Language usage in both L1 and L2, particularly in the area of linguistic preferences, is rather variable as evidenced by the consistently high standard deviations illustrated in the quantitative analyses in Chapters 4-6. Therefore, we should expect the effects of crosslinguistic influence to be variable also. As a result, an individual speaker may not display a given feature in their production all the time, and not all speakers will display the same collection of features. However, group analyses are still valuable to show the robustness of the full range of possible behaviors arising from the phenomenon of bidirectional crosslinguistic influence.

### **7.3.2 Within-learner comparison of L1 and L2 production**

In short, the general picture from the summary of L2 influence on an L1 (section 7.2.2) was very similar to the general picture from the summary of L1 influence on an L2 (section 7.2.5). Noticeable also may have been the seeming incompatibility of the simultaneous existence of L2 thinking for L1 speaking and L1 thinking for L2 speaking. Put in such juxtaposition, the statement does indeed seem rather contradictory. If the conclusion is reformulated to claim '*convergence* in L1 and L2 thinking for *convergence* in L1 and L2 speaking', it becomes more plausible. The precise logic underpinning this statement is spelled out in the following sections.

Within-subject comparisons presented at the end of each of the three studies revealed many differences, but also many similarities. This is rather remarkable since

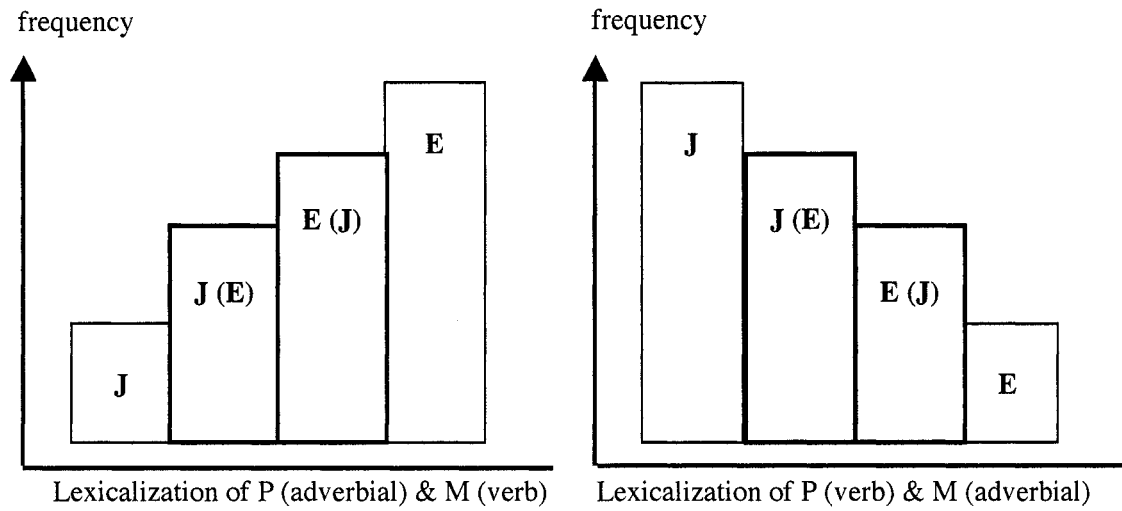
although production came from the same individuals, they were speaking two completely different languages in each condition. We will begin with an overview of the differences.

### **7.3.2.1 Differences in L1 and L2 production**

Native Japanese speakers with knowledge of English generally exhibited differing lexicalization patterns in their L1 and their L2. Chapter 4 showed differing patterns of lexicalization of Path, including differences in lexicalization of information about Source and Goal of motion. Chapter 5 showed differing patterns of lexicalization of Manner. These phenomena had repercussions for differences in the positioning of Path gestures and the semantic characteristics of the clause shown in Chapter 4, i.e. relative weight of Path expression. There may also have been implications for encoding of both Manner and Path in discourse, as well as production of Manner gestures shown in Chapter 6, although these effects were less strong and also areas where L2 production could have been affected by typical constraints on performing in a second language.

However, the differences described above must be interpreted in light of the more general patterns exhibited by each language. In other words, non-monolingual production, while largely complying with the lexical restrictions of each of the relevant languages, often operated at boundaries of these confines such that characteristic patterns diverged from the monolingual norms. A clear example of this can be seen in use of adverbials for Path expression examined in Chapter 4. Here, non-monolingual

Japanese speakers operating in their L1 mapped Path onto a morphosyntactic category allowable within the language, that of adverbials, but at higher rates than monolingual Japanese speakers. In contrast, in their L2, these same speakers exploited the same morphosyntactic category allowable in English, but at lower rates than monolingual English speakers. Therefore, although we tend to focus on the differences, there are in fact inherent similarities between non-monolingual L1-L2 production not seen in monolingual L1-L1 production. These *converging* patterns of L1-L2 production are illustrated in Figure 7.1, which also shows the relationship between lexicalization patterns and other linguistic phenomena.



**Converging patterns in L1-L2 lexicalization of Manner and Path**



**Converging patterns in L1-L2 positioning of Path gesture, semantic characteristics of clause, encoding of both Manner and Path in speech, and production of Manner-only gestures**

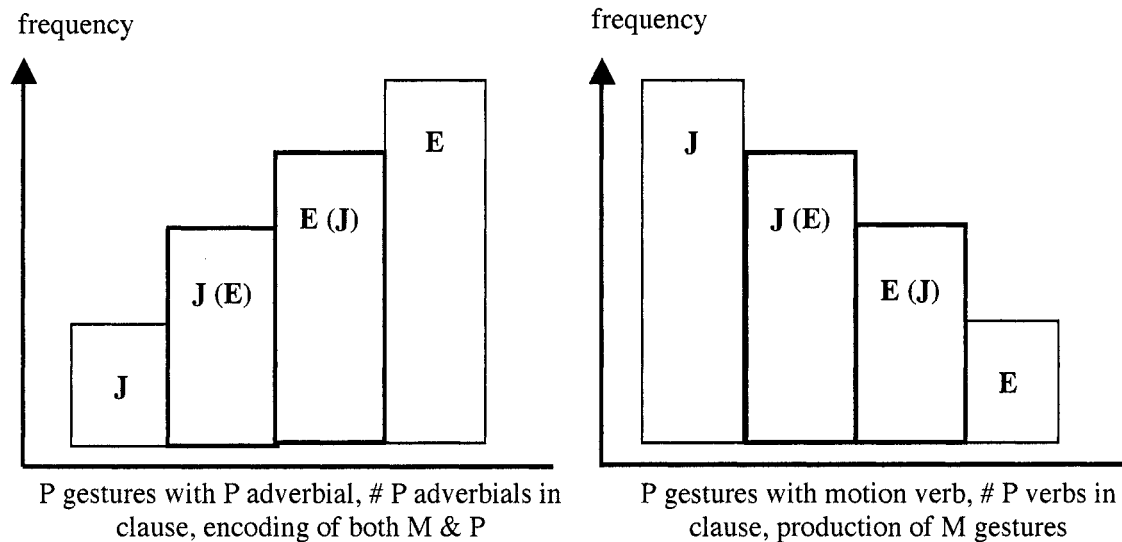


Figure 7.1: *Crosslinguistic patterns in lexicalization of individual components of Manner and Path yielding crosslinguistic patterns in positioning of Path gestures, semantic characteristics of clause, encoding of both Manner and Path, and production of Manner-only gestures among monolingual J, non-monolingual L1, J(E), and L2, E(J), and monolingual E groups*



On the one hand, it is important to acknowledge that the distributional similarities between the L1 and L2 may actually be spurious, i.e. that performance-related factors determining L2 distributions might be very different from factors determining L1 distributions. And indeed Stam's (2006) analysis of L1 and L2 production and Hohenstein, Eisenberg, and Naigles' (2006) analysis of the L1 both in Spanish learners of English in areas such as these did not yield comparable similarities. On the other hand, it is also possible that distributions in the L2 could have been affected by coexisting patterns within the speaker's L1. Interpreting both Stam's findings specifically on accumulation of Path expressions within the clause and Hohenstein et al's findings on use of adverbials in general together with findings of the same analyses presented here suggests that it is indeed the particular combination of languages as opposed to universal tendencies that yields the patterns we see. In other words, native Spanish speakers with knowledge of English are perhaps too constrained by their grammar to exhibit increased Path expression in their L1 by increased use of adverbials after exposure to English. This is clear at least from Stam's baseline results, where monolingual Spanish speakers never concatenated Path elements within the clause. However, there were no such baseline constraints here. Monolingual Japanese speakers concatenated just as many Path expressions as monolingual English speakers, in fact even more, albeit using different preferences for lexicalization. Thus, the very reason that non-monolinguals could exhibit greater Path concatenation than either monolingual group is that comparable types of lexicalization are allowable in both of their specific languages, which in turn allow L1 and L2 patterns to *converge*.

### **7.3.2.2 Similarities in L1 and L2 production**

The preceding discussion was intended to illustrate how, even in the case of significant within-subject differences, certain linguistic processes, such as the mapping of semantic components onto syntactic categories as in the process of lexicalization, could be more similar in a speaker's L1 and L2 than has previously been thought. Moreover, there were also obvious similarities found in L1-L2 production from the same group of individuals. These similarities were typically peripheral but related to lexicalization patterns and included clause type preferences, encoding in speech and gesture, and preferences for gesture perspective. In all of these areas of similarity, non-monolingual production in the L1 and L2 simultaneously differed, either significantly or in trends, from monolingual production. However, some of these areas exhibited parallel differences in the monolingual baseline, along the lines illustrated in Figure 7.1, while others did not. The areas in which comparable L1-L2 non-monolingual patterns lay between differing monolingual patterns will be discussed first.

#### **7.3.2.2.1 L1-L2 similarities in the context of differences in the monolingual baseline**

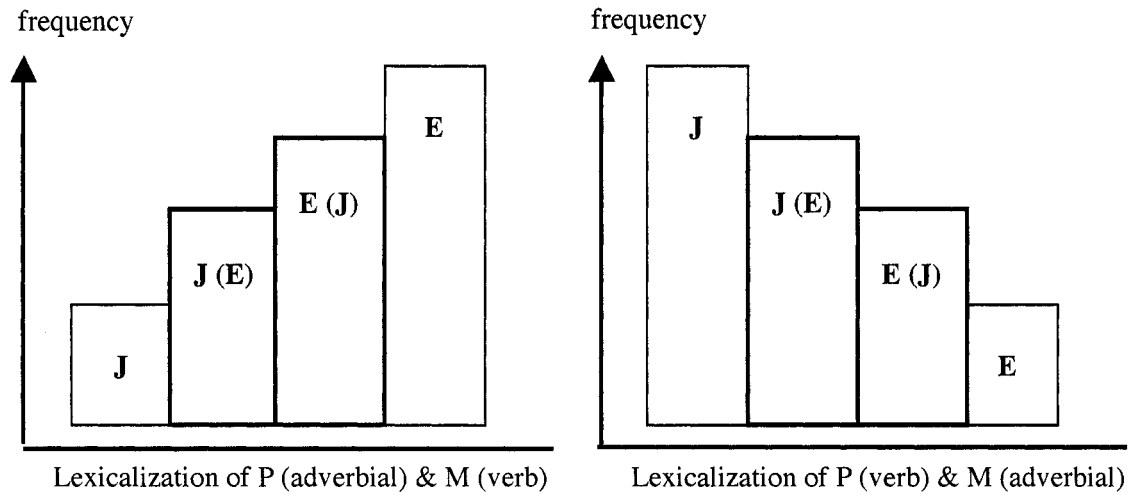
Regarding encoding of Manner in speech investigated in Chapter 5, non-monolingual production in L1 and L2 contained descriptively more mentions of Manner than monolingual Japanese production, but significantly fewer than monolingual English production. Similar patterns were seen in the degree to which gesture was used either to depict Manner in the absence of spoken reference to it or

downplay its significance in speech. These phenomena seemed to be linked to lexicalization patterns. Non-monolingual Japanese speakers showed evidence of learning in the L2 in target-like lexicalization of Manner, i.e. use of main verbs and comparison adverbials. At the same time, their L1 showed subtle shifts in lexicalization through use of slightly more finite verbs and comparison adverbials, and slightly less non-finite verbs and mimetics to express Manner. With lexicalization in such a major morphosyntactic component (i.e. finite verbs), non-monolingual speakers were observed to encode Manner descriptively more often in their L1 and significantly more often in their L2 than monolingual speakers of Japanese, but less often than monolingual speakers of English. In parallel, non-monolingual speakers in their L1 and their L2 shifted away from the gestural modality in expression of Manner, encoding Manner significantly less often in gestures accompanying Manner descriptions in speech than monolingual Japanese speakers, though again more often than monolingual speakers of English. It could be that the salience of Manner, indicated by its very presence in finite, main verbs, made corresponding expression of Manner in gesture somewhat redundant.

Somewhat similar patterns were seen in preferences for gesture perspective, although here non-monolingual Japanese speakers in their L1 and L2 more closely resembled monolingual English speakers than monolingual Japanese speakers. On the one hand, the limited use of mimetics in non-monolingual L1 Japanese discourse may have triggered limited use of character perspective in gesture. On the other hand, a degree of uncertainty about the accuracy of certain lexical items in L2 English may

have prompted additional usage of enactment hand-shapes in particular. In general, however, native Japanese speakers with knowledge of English exhibited high predominance of observer perspective in gesture in both L1 and L2.

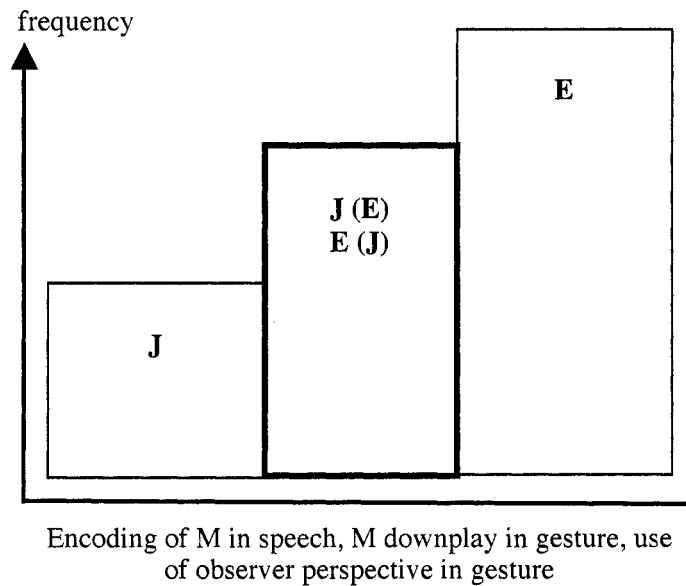
The above phenomena are illustrated in Figure 7.2. Here, *converging* lexicalization patterns in non-monolingual L1 and L2 result in a seemingly *convergent* rhetorical style in terms of speech / gesture encoding of Manner and gesture perspective, where the L1 and L2 look indistinguishable. This style then differs maximally from monolingual L1-L1 production.



**Converging patterns in L1-L2 lexicalization of Manner and Path**



**Convergent patterns in L1-L2 encoding of Manner in speech and gesture and gesture perspective**



Encoding of M in speech, M downplay in gesture, use of observer perspective in gesture

Figure 7.2: Crosslinguistic patterns in lexicalization of individual components of Manner and Path yielding crosslinguistic patterns in encoding of Manner in speech and gesture and gesture perspective among monolingual J, non-monolingual L1, J(E), and L2, E(J), and monolingual E groups

### **7.3.2.2.2 L1-L2 similarities in the context of similarities in the monolingual baseline**

Finally, we touch on areas where monolingual production in English and Japanese appeared to exhibit similarities, but non-monolingual L1-L2 production differed from the monolingual baseline. There are two relevant phenomena to be considered. The first is the finding from Chapter 6 on clause preferences for combined expression of Manner and Path. Monolingual speakers of Japanese showed equal preference for a mono-clause structure as monolingual English speakers. Yet, non-monolingual speakers of Japanese in their L1 and their L2 showed no such preference and exhibited fewer mono-clause structures and more multi-clause structures than both groups of monolinguals. Possible lexical and/or processing constraints on mono-clause structures in L2 production notwithstanding, these findings are striking. Moreover, a second similar phenomenon was seen in Chapter 4 on encoding of Goal in expression of Path. Observing lexicalization of Goal in both verbs and adverbials, monolingual speakers of English were equally likely to encode this component as monolingual Japanese speakers, and this tendency was not particularly strong, in line with other findings on English (cf. von Stutterheim, 2003). However, non-monolingual speakers of Japanese in their L1 and their L2 encoded Goal overall to a significantly higher degree than both groups of monolinguals, a finding which is unlikely to have been affected by factors shaping L2 production specifically.

Once again, these findings may be rooted in lexicalization patterns. Lexicalization of Manner in main verbs in L1 Japanese may have prompted the

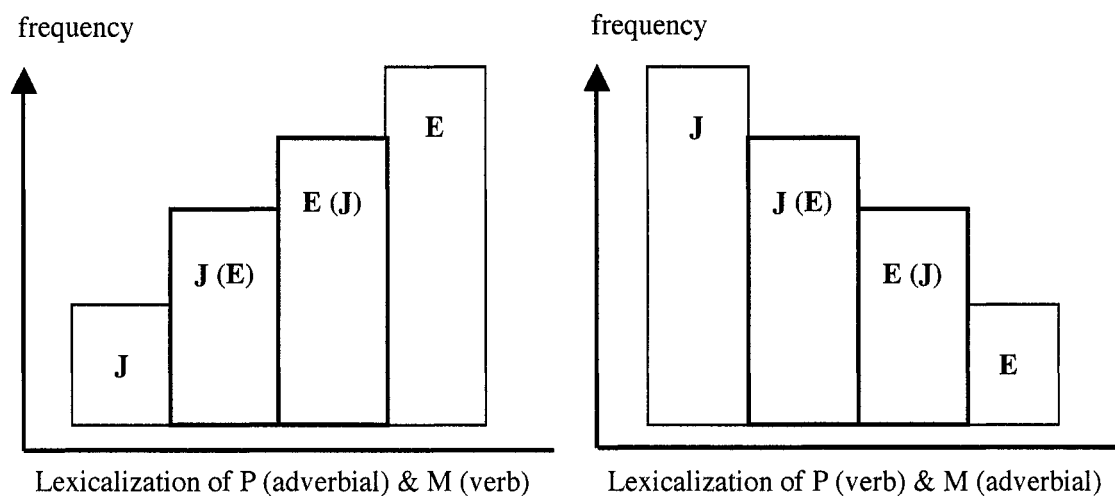
increase in multi-clause frames for combined expression of Manner and Path, resulting in a distributional frequency exceeding that of monolinguals. Interestingly, here we may have an alternative explanation for the abovementioned shift in Manner gesture patterns. If simultaneous encoding of Path in speech was constrained by lexicalization of Manner in a main verb, encoding may have shifted to the gestural modality, yielding the equivalent of a “Path fog” in non-monolingual discourse, i.e. encoding of Path in gesture in its absence in speech. This is speculation, of course, but one that warrants further investigation. Furthermore, whether lexicalization of Manner in main verbs actually prompted the increased use of multi-clause frames in L2 is another matter, because in English such lexicalization of Manner does not constrain simultaneous encoding of Path within the clause. On the one hand, use of multi-clause frames in L2 could be the result of transfer from the non-monolingual L1. On the other hand, it might be that multi-clause frames ease processing load, which explains their existence in L2.

Similarly, in non-monolingual expression of Path, we saw compelling evidence of convergence in lexicalization patterns, particularly in adverbial usage, which yielded a merged system partway between monolingual systems. However, the combined effects of such convergence may simultaneously have brought about additive effects in semantic encoding. With a combined strategy of lexicalization, non-monolingual L1-L2 encoding of Goal of motion could exceed that of monolinguals.

In sum, apparent crosslinguistic similarities in monolingual production may have arisen from underlying differences in a different linguistic dimension, the

crosslinguistic convergence of which led to a unique non-monolingual L1-L2 outcome. This phenomenon is illustrated in the example in Figure 7.3, where rhetorical style in terms of monolingual and non-monolingual encoding of Goal and clause type preference appear to evolve from the additive effects of *converging* patterns in lexicalization.





**Converging patterns in L1-L2 lexicalization of Manner and Path**



**Convergent patterns in L1-L2 encoding of Goal in speech and use of multi-clause structures**

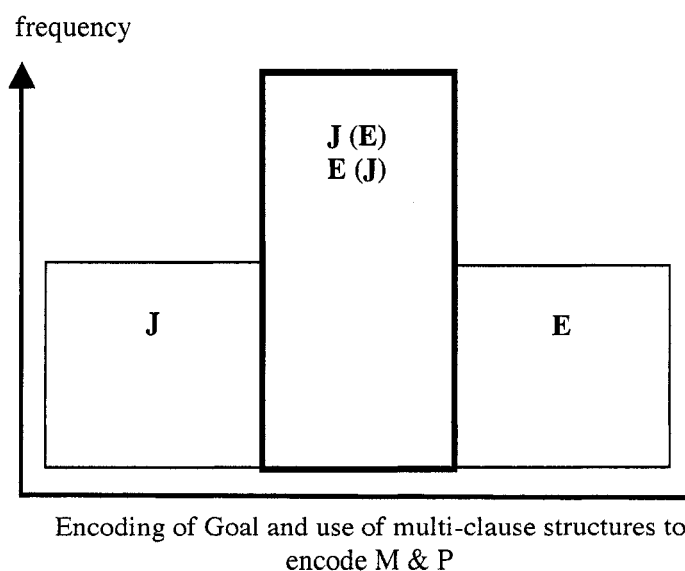


Figure 7.3: Crosslinguistic patterns in lexicalization of individual components of Manner and Path yielding crosslinguistic patterns in encoding of Goal in speech and use of multi-clause structures among monolingual J, non-monolingual L1, J(E), and L2, E(J), and monolingual E groups

### 7.3.2.3 *Convergence* in L1-L2 production

We have seen above that at different levels of linguistic analysis, different patterns in non-monolingual L1-L2 production as compared to monolingual production may be evident. For example, at the level of the semantic characteristics of the clause or encoding of both Manner and Path as seen in the lower panel of Figure 7.1, there is maximal contrast between monolingual L1 and non-monolingual L1 and L2 patterns. However, while monolingual L1s continue to differ at the level of encoding of Manner in speech and gesture, as seen in the lower panel of Figure 7.2, non-monolingual patterns in the L1 and L2 lose their contrast. Finally, at the level of encoding of Goal, as seen in the lower panel of Figure 7.3, a single monolingual – non-monolingual contrast surfaces. Yet all of these diverging outcomes appear to arise from a common process of *convergence* in lexicalization patterns, illustrated at the beginning of each of the preceding figures.

We might define this concept of *convergence* simply as a process where distributional frequencies in the L1 and L2 begin to merge.<sup>3</sup> In the case of the L1 of native Japanese speakers with knowledge of English, we can say that lexicalization patterns have shifted away from the monolingual Japanese pattern towards the monolingual English pattern. The same cannot be said of the L2 of native Japanese speakers with knowledge of English, of course, which never started out resembling the monolingual English pattern. However, we can say that lexicalization patterns in the

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<sup>3</sup> Many thanks here go to Peter Indefrey for the thought provoking discussion on different definitions of convergence, which inspired this line of thought.

L2, while perhaps perfectly functional, bear closer resemblance to lexicalization patterns of non-monolingual Japanese than patterns of monolingual English.

We might distinguish the concept of *convergence* from *attrition*, which could then be restricted to changes in what might be labeled 'core grammar'. At this point, our definition of core grammar is disappointingly, but necessarily vague. Suffice it to say that core grammar would probably not consist of interface areas or areas with grammatically licensed optionality, as in the case of lexicalization, but rather consist of more constrained linguistic domains. Therefore, shifts in core grammar would be expected to lead to ungrammaticality, something that is not attested in this thesis and hence not part of the above notion of convergence. Clearly much more work distinguishing core grammar from other parts of the linguistic system is needed, but greater understanding of the notion of convergence, i.e. which linguistic domains are susceptible to convergence and which are not, might even help to narrow down a definition of core grammar. On this optimistic note, we turn now to implications of these findings.

#### **7.4 Implications of research**

Implications of this research can be divided into those for theory and those for practice.

#### 7.4.1 Theoretical implications

The primary theoretical implication of the work undertaken in this thesis was to connect the fields of second language acquisition and bilingualism, by showing how interactions that have been found between language systems in the minds of bilinguals, such as those pertaining to lexical activation, for example, can also be seen in the minds of language learners, and are reflected in patterns of language usage. While the concept of effects of an L1 on an L2 is not novel and has been used extensively to further our understanding of the process of second language acquisition, the possibility that an emerging language can actually influence an established language has not been given equal weight. Instead, the established native language has been treated as a 'fixed target', against which all L2 production can be compared and assessed. If this standard is actually a "myth" (cf. Davies, 2003), and the reality of the native L1 can be viewed more in terms of a 'moving target', 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 limits on ultimate attainment in an L2 (cf. Birdsong, 2005). If simultaneous bilinguals, despite variation in production, are credited with "native-like" proficiency in each of their languages, so should highly proficient L2 learners, with analogous variation in production.

These findings have additional implications for models of second language acquisition that simply view the second language system as parasitic on the first. While many areas of the emerging second language may be filtered or processed through corresponding areas of the first language, e.g. conceptual representations, this

relationship should perhaps not be characterized in terms of parasite-host, but in a rather more dynamic interaction. These implications also prompt second language learners to be viewed from a more humanitarian standpoint as “second language *users*”, as proposed in the extensive writings and teachings of Vivian Cook (1992, 2003, 2006, inter al.), which also encourages reconsideration of the labeling of L2 production as ‘target-like’ or ‘non-target-like.’

A further implication is in a call for a distinction to be made between the constructs of language convergence and language attrition. In many cases, such a distinction is not made. Myers-Scotton (2005), for example, argues that the outcome of both processes is the same, while acknowledging that the underlying reasons may be different. Other research essentially adopts the same position albeit less explicitly. However, the outcome of these processes may not be the same if, as stated above, one restricts convergence to changes in distributional frequencies particularly in interface phenomena, which do not yield examples of ungrammaticality, and attrition to changes in core linguistic areas, which may yield ungrammaticality.

Such an argument is particularly meaningful in the current context because of the different learning conditions involved. Previous research by Kecskes and Papp (2000) argued that different learning conditions of an L2 would lead to differing effects on an L1. Classroom learning of a foreign language was predicted and found to trigger positive transfer of pragmatic and conceptual information, which could enrich the development of an L1. However, second language learning in an L2 environment was predicted and found in other studies to trigger negative structural and lexical transfer,

often due to external social, economic and political pressures. Kecskes and Papp claimed that the outcome in such circumstances is often attrition of the L1. This study, however, exploited two learning conditions: one fitting the profile sometimes associated with attrition, L2 speakers living in an L2 community (i.e. Japanese learners of English residing in the USA), and the other consisting essentially of foreign language learners of the common garden variety (i.e. Japanese learners of English living in Japan). Yet both of these groups exhibited comparably altered patterns of language usage in the interface between lexical and structural domains, alterations that clearly did not fall under the label of attrition. These results suggest that linguistic systems can interact at a more individual level without concomitant institutionalized interactions between different speech communities. Moreover, such interactions can involve structural and lexical phenomena, which do not necessarily indicate or lead to attrition.

Furthermore, these findings may in turn be linked to issues in the field of language contact, such that synchronic changes within a group of individuals in the process of even foreign language learning might be later viewed as diachronic changes within an entire speech community. Indeed, within the domain of motion, languages have been known to shift typologically for many reasons (cf. Kopecka, *in press*), but also as a result of language contact. Slobin (2004) proposed that, due to contact with German, Italian exhibits greater use than other verb-framed languages of directional adverbs combined with Manner verbs and simultaneous, mono-clause expression of Manner and Path in contexts of boundary crossing. Many of the findings here appear to

stem from influences in lexicalization patterns at the interface between morphosyntax and semantics. This is striking because these are areas where languages often have freedom to move, to experiment and perhaps ultimately to change. Moreover, if it really was the specific presence of English which gave rise to new distributions of language usage seen in non-monolingual Japanese production, then one might more strongly predict elements of diachronic change given how prevalent the learning of English is in Japan.

An additional contribution of the current research is in the typological domain itself. Much of the research conducted after Talmy's initial presentation of crosslinguistic differences in motion event construal has focused almost exclusively on the verb, perhaps with good reason. However, the studies undertaken here attempted to broaden the scope somewhat, by looking at the many ways speakers of different languages can talk about motion. As a result, we observed a distinction between what speakers of a language *can* do and what they *actually* do, expression of Path in English being a case in point. While much research has described the morphosyntactic resources of English, which allow depiction of complex journeys within single clauses (cf. Slobin, 1996b; 2004 inter al.), the fact remains that English speakers do not always choose to encode such complexity.<sup>4</sup> Indeed, in many cases the English speakers in this study did not explicitly talk about Source and Goal of motion in comparison to Japanese speakers, and in this respect verb-framed Japanese more closely resembled satellite-framed German.

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<sup>4</sup> Although as pointed out by Matsumoto (p.c.), the stimuli used here might not have elicited descriptions of the complex journeys that are generally codable in English.

A final implication of the current work relates to the semantic relationship between speech and gesture. Previous hypotheses claimed a link between the degree of concatenation of Path in speech and gesture such that greater numbers of Path expressions should lead to greater numbers of Path gestures (cf. McNeill, 1997; Stam, 2006). While this makes intuitive sense and can certainly be illustrated by specific examples, this particular semantic link between speech and gesture was not empirically supported here. In fact the reverse relationship was depicted, whereby the group with the lowest concatenation of Path expression actually exhibited the highest concatenation of Path gesture. This particular finding, described in Chapter 4, may be related to an alternative phenomenon, described in Chapter 6, that of semantic overlap between speech and gesture. Recall from Chapter 6 that monolingual English speakers were found to downplay Manner information in speech by gesturing only about Path significantly more often than monolingual Japanese speakers. This phenomenon could have been observed as a non-causally related concatenation of Path in gesture when there was no concatenation of Path in speech. Whether this truly explains the findings contradicting previous claims in Chapter 4 or not, at least there is a need to explore further the semantic relationship between speech and gesture in order to derive alternative testable hypotheses.

#### **7.4.2 Methodological implications**

Further implications of this research are methodological. First, we have seen how the mature L1 is perhaps not as stable as was previously considered. As a result, it



becomes less meaningful in certain contexts to compare the L2 system of a language learner to the linguistic system of a monolingual speaker of the target language because multilingual linguistic systems, at whatever stage of development, cannot be expected to be the same as monolingual linguistic systems. Birdsong (2005) argues that if such comparisons are made, they should be made for descriptive purposes, in particular to identify domains in which many learners achieve native-like proficiency and domains, if there are any, where no learner, regardless of how proficient, appears native-like.

If the goal is evaluation, in contrast, it becomes less reasonable to use monolingual language production as a benchmark for multilingual language production, either in the L1 or the L2. Thus, alternative comparisons should be made between the linguistic systems of learners and those of bilinguals, for such comparisons would stand a greater chance of having instructive value.

There are additional terminological implications for investigations of 'crosslinguistic influence'. While this term, proposed by Kellerman and Sharwood Smith (1986), is certainly preferable to alternatives such as 'interference,' its application is in some ways rather broad and in some ways not broad enough. Much research undertaken within the framework of crosslinguistic influence studies only unidirectional influence. The issue is whether this should somehow be distinguished from work employing a bi-directional experimental paradigm. A further difficulty is the inherent ambiguity in the term 'bi-directional' itself. On the one hand it refers to studies such as Rocca (2002), who simultaneously examined transfer effects in English learners of Italian as well as Italian learners of English. On the other hand, the term could refer

to studies such as those presented here, where influence of an L2 on an L1 is observed concurrently with influence of an L1 on an L2. In reality, it may not be necessary to discriminate fully between traditional one source - one target studies and Rocca-type two source - two target studies, since both types essentially look at influence of the L1 on the L2. Labels along the lines of 'single source-target crosslinguistic influence' and 'multiple source-target crosslinguistic influence' might suffice and be distinguished from 'convergence in crosslinguistic influence' used to describe the within-subject bi-directional influence studied here.

Final methodological implications refer to general procedures for undertaking research on crosslinguistic differences. Typological studies, in particular, often present results from sample populations as if they were generalizable to entire speech communities. However, in reality findings may be limited simply to other speakers who share a similar language background to those in the sample. The superficial incompatibility between findings here and those in Kita and Özyürek (2003) is a case in point. In their study, Japanese speakers packaged Manner and Path in separate clauses and produced comparable high numbers of gestures separating Manner and Path. This pattern was not seen among the monolingual Japanese speakers involved in the current study, who preferred to combine Manner and Path in single clauses, while to some extent maintaining the separation in gesture. However, the results become much more compatible if the participants in the previous study are compared to the non-monolingual Japanese participants in the current study. Under this comparison, both groups exhibited comparable tendencies to separate Manner and Path in speech and

gesture. Indeed, Kita (p.c.) acknowledged that their participants may have had some proficiency in English. While this does not necessarily challenge Kita and Özyürek's main conclusions, since these were related to the relationship between speech and gesture as opposed to crosslinguistic differences *per se*, it does suggest the need for care in subsequent interpretation and use of their results as an illustration of general patterns in Japanese.

### **7.5 Limitations of study**

There are several limitations of this research that should be mentioned. The first is the general difficulty associated with ensuring crosslinguistic comparability in coding schemes. The challenges in deciding what did and did not count as encoding of Manner and Path require that some of the inter-language results be treated with caution. However, internally consistent coding within each language means that we can at least be secure about intra-language results. Moreover, these are the results on which main findings with regard to interactions between linguistic systems within the multilingual mind are based.

A second limitation of the study relates to comparisons between production in the non-monolingual L1 and L2. As stated previously, in many instances these looked the same. However, we cannot be entirely sure that similar patterns arose for similar reasons, just as we cannot be entirely sure that differing patterns arose for differing reasons, because of the added complexities involved in production of a second language. Thus, it is not clear to what extent lexical or processing difficulties in the L2

may have driven some of the findings. However, this is more or less likely depending on the precise linguistic feature. While comparable use of multi-clause structures in non-monolingual production may have been partly determined by processing limitations in the L2, highly frequent encoding of Goal of motion in non-monolingual L1 and L2 is an area where general constraints on L2 production were not assumed to have played a role.

Finally, although this study aimed to test effects of acquisition of a second language on a mature L1, we cannot be fully sure that the effects observed did not occur at a stage when the L1 itself was still developing. All participants were exposed to English from junior high school age, and the effects described here may have occurred at this early stage. The fact that the “monolingual” Japanese speakers were also exposed to English at the same time but did not exhibit the same effects may simply have been due to a long period of distance from the L2. The best way truly to test interactions between an emerging L2 and an established L1, of course, would be to conduct a longitudinal study. But another way of addressing this problem would be at the very least to obtain cross sectional data from different proficiency levels.

## **7.6 Future research**

Among the host of unresolved issues for future research is the continuing question of the nature of the interaction between linguistic systems in the mind of a second language learner. This issue was laid out as a motive underlying the central research questions, and was approached within the framework of crosslinguistic

influence. Many findings were interpreted from the perspective of bidirectional influence, and were therefore recruited as evidence for a characterization of the ways in which linguistic systems interact within an individual mind. However, it should be noted simultaneously as both a limitation and an area for further research that we cannot be sure whether the effects observed were really due to the presence of English, or might just as easily have been observed with the presence of any second language.

In recognizing this problem, we acknowledge the possibility of universal default patterns arising from the interaction of any linguistic systems, not just those studied here. In other words, a universal L1-L2 interlanguage system may exist. Relevant to this argument is the finding from Giacobbe's (1992) study cited in Chapter 4, in which significant L2 use of adverbials to express Path was a prominent feature of neither the source nor target languages. Interestingly, increased use of adverbials for Path expression was also one of the main observations for non-monolingual L1 production, and is therefore a candidate for a universal default explanation. The only way to fully tease apart language-specific from universal patterns would be to replicate this research with a different L1-L2 pairing. Commonalities in L1-L2 usage across different language groups would suggest a universal developmental trajectory arising from the interaction of two linguistic systems. In the event of differences in L1-L2 usage across different language groups, we could conclude that the precise nature of interaction between two linguistic systems is language-specific, determined by properties of the particular languages involved.

A second area needing further investigation is that of gesture perspective. It was clear that there were crosslinguistic differences in perspective preferences, which have not been noted previously, but it is much less clear why these differences exist. The obvious explanation of simple cultural differences did not seem very compelling in this case for three reasons. First, other findings on perspective taking in gesture with the same cultural groups did not find such a difference (cf. Kita & Özyürek, 2003). If this really were a robust cultural difference, one would expect it to show up elsewhere. Second, a shift in perspective preferences was exhibited by native Japanese speakers with knowledge of English in their L1. However, this shift was observable just as clearly, if not more so, among those who had had little cultural exposure as compared with those who had been immersed in an English-speaking culture for between one and two years. Thirdly, neither of these non-monolingual groups exhibited source-like patterns in their L2.

Thus, an alternative explanation was proposed whereby gesture perspective might be motivated by something in the linguistics of the accompanying speech. Mimetics were considered a likely candidate for several reasons. First, there may be an intuitively appealing semiotic relationship between highly iconic mimetics and highly iconic representational gestures. Second, character perspective in gesture can be considered rather Manner biased because of the dimension of hand-shape. Chapter 5 discussed the problems of the rather imprecise definition of Manner in general, but use of an instrument can be considered one of the components, which is a feature that can be reflected in the hand-shape properties of gesture. In other words, by employing an

enactment hand-shape in gesture illustrating use of an instrument, the speaker is emphasizing the Manner of motion, which would explain use of character perspective gestures in the context of Manner mimetics. Finally, the lexical category of mimetics comprises a crosslinguistic difference between Japanese and English mirroring that of preferences for gesture perspective. It was also an area where non-monolingual production appeared to be shifting. Unfortunately, however, strong patterns of co-occurrence at the clausal level between presence of mimetics and use of character perspective were not found. It was concluded that perhaps global presence of mimetics in wider discourse prompted global preferences for gesture perspective among speakers of Japanese.

An alternative explanation that warrants consideration is that instead of character perspective being motivated by something special in Japanese production, i.e. mimetics, observer perspective might have been motivated by something special in English production. A likely candidate here is the phenomenon described in Chapter 4, that of expression of Path. While character-perspective gestures may be seen as Manner biased, observer perspective gestures can be seen as more Path biased. Reasons for this involve the dimensions of hand-shape and direction. First, observer perspective gestures employ neutral hand-shapes with no encoding of instrument, and thus do not carry a specific Manner focus. Second, encoding of Source and Goal of Path in gesture might more likely be set up on a lateral as opposed to a sagittal axis, resulting in observer perspective.<sup>5</sup> Therefore, it could be that Path-heavy utterances in English, with

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<sup>5</sup> Many thanks go to Asli Özyürek for initially suggesting this.

a greater degree of concatenation of Path expression as well as explicit mention of Source and Goal, lead to predominant patterns of observer perceptiveness in gesture.

While the alternative explanation above does have some appeal, it is difficult to apply it to this particular dataset because in reality English speakers did not concatenate Path expression to the degree expected and exhibited rather less mention of Source and Goal than other groups. Whether such a relationship between the linguistics of Path expression and perspective taking in gesture might exist at a more global level remains to be considered, but at the very least perspective taking in gesture is an issue that warrants further investigation.

Final areas of further research relate to proficiency level, linguistic domain, and implications for non-linguistic cognition. If the cautious conclusions regarding interactions between emerging and established language systems within an individual mind are genuine, then it would be interesting to determine exactly how much exposure to a second language is necessary before these effects are evident in the first language. Furthermore, it would be interesting to see whether some of the interesting trends found in this thesis, for example slightly greater encoding of Manner in non-monolingual Japanese discourse compared to monolingual Japanese discourse, became more or less robust differences with increasing proficiency in the L2, since Hohenstein, Eisenberg and Naigles (2006) did not find effects of L2 English on L1 Spanish among ‘bilinguals’ in this area.<sup>6</sup> To address these issues, data from speakers of differing proficiencies in the L2 would be needed. Furthermore, it would be interesting to see if the findings here

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<sup>6</sup> Participants in the study were classified as “early” or “late” bilinguals, but no objective measure of proficiency was given.



are generalizable to other motion events, in the first instance, and to other linguistic domains outside of motion in the second instance. This is particularly important given that some of the findings appeared to differ slightly depending on exactly which of the four events was being described. To answer these questions, more data would similarly be needed. Finally, conflicting results in previous non-linguistic studies notwithstanding, the findings presented here may have implications for non-linguistic cognition, but the addition of non-linguistic experimental tasks would be necessary to investigate this hypothesis fully.

### **7.7. Final conclusions**

To conclude, this thesis examined crosslinguistic influence in construal of motion events with the objective of gaining insights on the interaction between language systems in the mind of a learner. These questions were investigated in three separate studies of speech and gesture: expression of Path, expression of Manner, and combinations of Manner and Path. Overall findings, a combination of robust results and the preponderances of trends pointing in the same direction, from comparisons of six different sources of data suggested the existence of crosslinguistic influence in both directions. This was interpreted as evidence for convergence, particularly in the interface between morphosyntax and semantics, between the established L1 and emerging L2 in the minds of intermediate level language learners.

These conclusions offered empirical support for two similar positions. The first is Grosjean's (1982) notion that a bilingual should not be expected to resemble two

monolinguals in one. The second is Cook's (1992) concept of "multicompetence", in which multiple competencies exhibited by multilinguals differ from single competencies exhibited by monolinguals. The thesis applied these models to learner as opposed to bilingual data, showing that the L1 of even a less proficient speaker of a second language may be qualitatively different from the L1 of a monolingual.

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## Appendix I: Participant Biographical Information

### Key

*	:	missing data
NA	:	not applicable
G	:	gender: F = female, M = male
Eng Use	:	use of English (hours per day)
FL	:	foreign language: Ch=Chinese, En=English, Fr=French, Ge=German, In=Indonesian, It=Italian, Ko=Korean, Sp=Spanish,
AoE	:	age of exposure to foreign language
LoE	:	length of exposure to foreign language (years)
Self score	:	average of individual scores on speaking, listening, writing reading, grammar and pronunciation
Oxf score	:	Oxford Placement test score
Camb score	:	Cambridge FCE oral score
Country	:	countries visited
Age	:	age of visit to country
Time	:	length of stay in foreign country (years)
Prod. Use	:	productive English use (listening, reading)
Rec. Use	:	receptive English use (listening, reading)

## Monolingual Japanese Participants

ID	G	Age	Eng Use	FL	AoE	LoE	Self Score	Oxf Eng Score	Camb Eng Score	Country	Age	Reason	Time
J2	F	40	0	En	12	8	1.00	NA	NA				
J3	F	36	0	En	13	6	1.00	NA	NA				
J4	F	39	0	*			*	NA	NA				
J6	F	38	0	*			*	NA	NA				
J7	F	34	0	*			*	NA	NA				
J8	F	41	0	En	12	6	1.00	NA	NA				
J49	F	38	0	En	12	6	1.33	NA	NA				
J50	F	35	0	En	13	6	1.00	NA	NA				
J53	F	42	0	En	13	6	*	NA	NA				
J54	F	34	0	Sp	14	8	3.00			Spain	18	Study	3.00
		34		En	7	11	1.17	NA	NA	Netherlands	19	vacation	0.05
J55	F	40	0	En	14	10	1.00	NA	NA				
J56	F	34	0	En	13	6	1.67	NA	NA				
J58	F	44	0	En	13	6	2.50	NA	NA				
J59	F	44	0	Ch	28	5	2.83						
		44		En	13	6	1.50	NA	NA				
		44		Ko	44		1.00						
J60	F	34	0	En	12	6	1.00	NA	NA				
J61	M	36	0	En	13	6	2.00	NA	NA				

## Monolingual English Participants

ID	G	Age	Eng Use	FL	AoE	LoE	Self Score	Oxf Eng Score	Camb Eng Score	Country	Age	Reason	Time
E1	M	21	NA	Fr	7	6	2.83	NA	NA	NA			
E2	M	20	NA	Sp	16	4	1.50	NA	NA	NA			
E3	M	20	NA	Sp	13	4	1.50	NA	NA	NA			
E4	M	20	NA										
E5	M	19	NA	Fr	11	2	1.83	NA	NA	NA			
E6	M	19	NA	Sp	13	5	3.00	NA	NA	NA			
E7	F	27	NA	Sp	10	4	3.00	NA	NA	NA			
E8	F	48	NA										
E9	M	48	NA	Fr	11	4	1.00	NA	NA	NA			
		48		Ge	18	1	1.00						
		48		Sp	30		1.00						
E10	M	48	NA	It	44	2.5	1.67	NA	NA	Italy	43	Vacation	0.08
		48		Fr	15	1	1.33			France	43	Vacation	0.04
E11	M	18	NA	Sp	14	2	2.5	NA	NA	NA			
E12	F	20	NA	Ge	19	0.3	2.00	NA	NA	NA			
		20		Fr	14	2	1.00						
E13	F	20	NA	Fr	11	5	1.67	NA	NA	NA			

## Native Japanese Speakers with Intermediate L2 English in Japan

ID	G	Age	Eng Use	FL	AoE	LoE	Self Score	Oxf Eng Score	Camb Eng Score	Country	Age	Reason	Time
J12	M	30	Rec: 1.0	En	13	6	2.67		4.00	Canada	21	Study	0.50
				In	22	1	1.50			Indonesia	22	Job	0.66
J20	F	43	Prod: 2.0	En	9	12	3.33	88%	4.67				
			Rec: 6.0	It	23	8	2.33						
				Sp	35	7	2.33						
J26	F	46	Rec: 0.8	En	13	7	3.17	75%	4.67	USA	38	Study	0.25
				Ge	35	0.08	1.33			USA	18	Study	0.25
				It	44	0.5	1.33			Germany	35	Study	0.12
J27	F	47	Prod: 1.0	En	12	12	4.17	81%	4.67	USA	21	Study	0.28
										USA	30	Family	6.00
J29	F	41	Prod: 0.1	En	13	8	3.00	73%	4.33	England	22	Study	0.16
			Rec: 1.0										
J31	F	20	Rec: 0.6	En	12	8	3.33	79%	4.00				
				Ch	18	2	1.33						
J35	F	19	Rec: 2.5	En	12	6	2.00	73%	4.00				
				Ch	19	0.12	1.00						
J47	M	20	Rec: 0.5	En	13	6	3.50	75%	4.67				
				Fr	20		1.33						
J62	F	33	Prod: 0.5	En	12	9	3.17	88%	4.67				
			Rec: 1.0	Ge	19	4	1.66						
				Ch	21	1	1.33			Australia	22	Study	0.8
J63	F	39	Prod: 4.0	En	13	8	3.00	*	5.00				
			Rec: 3.0	Fr	18	2	1.00						



<b>J64</b>	F	42	Prod: 5.0 Rec: 3.5	En Fr	12 39	8 3	2.83 1.00	85%	5.00	USA	20	Study	0.08
<b>J68</b>	F	46	Rec: 1.0	En	11	16	3.00	77%	3.67	Australia	27	Husband	1.50
<b>J69</b>	F	43	Prod: 1.5 Rec: 1.5	En	10	11	3.00	77%	3.67				
<b>J70</b>	F	45	Prod: 1.0	En Fr	12 18	12	2.00 0.66	60%	2.00				
<b>J75</b>	F	22	Prod: 2.0 Rec: 5.5	En Fr	12 18	10 2	2.33 1.50	69%	5.00	USA Canada USA	19 22 22	Study Study Study	0.08 0.08 0.08
				Sp Ge Ko	22 22 22		1.00 1.00 1.00						

### Native Japanese Speakers with Intermediate L2 English in the USA

ID	G	Age	Eng Use	FL	AoE	LoE	Self Score	Oxf Eng Score	Camb Eng Score	Country	Age	Reason	Time
<b>J10</b>	M	44	Prod: 3.0 Rec: 4.5	En	13	9.25	3.83	67%	3.00	USA	43	Study	0.75
<b>J22</b>	F	22	Prod: 13.0 Rec: 16.25	En It	13 13	9	4.33	85%	3.00	USA USA	20	Study	1.80
<b>J71</b>	F	21	Prod: 13.0 Rec: 16.25	En It	14 13	6 1	2.83 1.00	81%	3.67	USA USA	20 20	Study Study	1.00 1.00
<b>J72</b>	F	29	Prod: 4.0 Rec: 7.0	En	13	10	2.67	79%	4.00	USA	28	Study	1.50
<b>J73</b>	F	45	Prod: 3.0 Rec: 4.5	En	13	7	3.00	63%	3.67	Australia USA Holland	36 44 34	Study Study Work	3.00 1.00 0.25

<b>J74</b>	<b>M</b>	<b>21</b>	<b>Rec: 1.0</b>	<b>En</b>	<b>13</b>	<b>8</b>	<b>2.33</b>	<b>65%</b>	<b>4.33</b>	<b>USA</b>	<b>17</b>	<b>Study</b>	<b>0.80</b>
				<b>Ch</b>	<b>19</b>	<b>1</b>	<b>1.00</b>			<b>USA</b>	<b>21</b>	<b>Study</b>	<b>1.00</b>
<b>J76</b>	<b>F</b>	<b>29</b>	<b>Prod: 5.0</b>	<b>En</b>	<b>13</b>	<b>16</b>	<b>4.00</b>	<b>77%</b>	<b>4.67</b>	<b>USA</b>	<b>28</b>	<b>Study</b>	<b>1.00</b>
			<b>Rec: 7.0</b>	<b>Fr</b>	<b>19</b>	<b>2</b>	<b>1.00</b>						
<b>J77</b>	<b>M</b>	<b>36</b>	<b>Prod: 8.0</b>	<b>En</b>	<b>12</b>	<b>24</b>	<b>3.33</b>	<b>81%</b>	<b>3.33</b>	<b>USA</b>	<b>22</b>	<b>Study</b>	<b>0.08</b>
			<b>Rec: 2.6</b>	<b>Fr</b>	<b>18</b>	<b>2</b>	<b>2.00</b>			<b>USA</b>	<b>35</b>	<b>Work</b>	<b>1.00</b>
				<b>Ge</b>	<b>18</b>	<b>2</b>	<b>1.00</b>						
<b>J78</b>	<b>M</b>	<b>26</b>	<b>Prod: 0.5</b>	<b>En</b>	<b>12</b>	<b>14</b>	<b>3.50</b>	<b>83%</b>	<b>3.00</b>	<b>USA</b>	<b>25</b>	<b>Work</b>	<b>1.50</b>
			<b>Rec: 3.0</b>	<b>Ge</b>	<b>20</b>	<b>2</b>	<b>1.83</b>						
<b>J79</b>	<b>M</b>	<b>34</b>	<b>Prod: 1.0</b>	<b>En</b>	<b>12</b>	<b>10</b>	<b>3.00</b>	<b>85%</b>	<b>4.00</b>	<b>USA</b>	<b>33</b>	<b>Study</b>	<b>1.00</b>
			<b>Rec: 2.5</b>	<b>Ge</b>	<b>18</b>	<b>1</b>	<b>1.00</b>						
<b>J80</b>	<b>M</b>	<b>28</b>		<b>En</b>	<b>13</b>	<b>8</b>				<b>USA</b>	<b>27</b>	<b>Work</b>	<b>0.50</b>
			<b>Prod: 2.0</b>				<b>1.83</b>	<b>77%</b>	<b>4.00</b>				
			<b>Rec: 5.0</b>	<b>Ge</b>	<b>19</b>	<b>2</b>	<b>1.00</b>						
<b>J81</b>	<b>F</b>	<b>31</b>	<b>Prod: 2.0</b>	<b>En</b>	<b>12</b>	<b>6</b>				<b>USA</b>	<b>30</b>	<b>Work</b>	<b>1.50</b>
			<b>Rec: 2.5</b>				<b>4.00</b>	<b>58%</b>	<b>2.33</b>				
<b>J82</b>	<b>F</b>	<b>27</b>	<b>Prod: 1.0</b>	<b>En</b>	<b>13</b>	<b>10</b>	<b>3.83</b>	<b>77%</b>	<b>5.00</b>	<b>UK</b>	<b>25</b>	<b>Study</b>	<b>1.00</b>
			<b>Rec: 3.0</b>	<b>Fr</b>	<b>18</b>	<b>4</b>	<b>3.17</b>			<b>USA</b>	<b>26</b>	<b>Study</b>	<b>1.00</b>
				<b>Ch</b>	<b>19</b>	<b>1</b>	<b>1.50</b>						

## Appendix II: Description of Canary Row Stimulus

The following is an excerpt from the frame by frame analysis of the cartoon Canary Row provided by Elena Levy (McNeill, 1992:366-374). Numbers correspond to scene numbers in the entire cartoon. Bold type highlights the four motion events that are analyzed in this thesis. The text is merely intended to give readers unfamiliar with the cartoon an idea of the events. Participants were, however, free to describe the scenes in any way they wanted and were dependent on their memory of each scene. Therefore, their descriptions may not match exactly the analysis below.

TB = Tweety Bird  
S = Sylvester

### Scene 2 or 7: Drainpipe

37. TB swinging on swing in his bird cage, singing "When Irish Eyes are Smiling"
  - 38. scene shifts to S climbing up a drainpipe; TB is still singing**
  39. scene shifts back to TB swinging
  40. as camera moves back from bird cage, you see S's hand off to the right moving back and forth, conducting; TB still singing
  41. camera stops movement back when you see all of S; still conducting; TB still singing
  42. TB turns his head to right and looks at S; TB stops singing
  43. S waves
  44. TB moves around in bird cage; S looks surprised; TB says "help, help, the bad ole putty cat is after me!"
  45. TB flies out of cage; S goes after him
  46. scene is of bird cage in window; sounds of fighting
  47. S comes flying out of window
  48. G comes to window and looks out of it, holding umbrella; sounds of crash
  49. G says "ye-e-es, that'll teach you" and points a finger down, apparently at S
  50. G still talking, shakes umbrella, presumably at S; G says "next time I'll give you what fer"
  51. TB flies to top of bird cage and stands there
  52. camera zooms in on TB, who's pointing a finger down, and saying "bad old putty cat"
  53. TB lifts chin way up
- FADEOUT

### Scene 3 or 6: Bowling

54. scene is side of building, bottom of drainpipe; S pacing back and forth
55. S stops and looks up, then down at bottom of drainpipe, then up
- 56. S crawls in the drainpipe**
57. scene shifts to top of drainpipe; TB standing on window sill looking down

58. TB looks surprised  
**59. scene shifts to central portion of drainpipe; camera moving up drainpipe**  
 60. camera reaches top of drainpipe again; still see TB  
 61. TB looks excited, jumps up and runs to left  
 62. same scene, but TB absent  
 63. TB reappears carrying bowling ball  
 64. TB dumps bowling ball into top of drainpipe  
 65. scene shifts to side of building, central portion of drainpipe  
 66. bulge moves down drainpipe  
 67. camera angle shifts so that looking down on drainpipe from above  
 68. bulge moves down drainpipe  
 69. scene shifts to side angle of drainpipe  
 70. bulge moves down  
 71. bulge explodes  
 72. scene shifts to street  
 73. S falls into street with bowling ball-shaped bottom  
**74. S rolls down street on bottom, feet rotating above the ground**  
**75. S rolls down different part of street, looks upset**  
**76. scene of empty street**  
**77. scene shifts to end of street; bowling alley**  
**78. S rolls into entrance of bowling alley**  
 79. same scene as 76 (without S); sounds of bowling pins crashing  
 FADEOUT

Scene 7 or 2: Rope

233. scene shifts to inside room; S at drawing board drawing a blueprint; telescope pointing out window to left  
 234. S looks to left  
 235. S moves to telescope at window; camera follows him  
 236. S looks through telescope  
 237. S moves back to drawing board, smiling; camera follows him  
 238. S jumps on stool at drawing board and continues to draw  
 239. scene shifts to TB in cage on window sill  
 240. camera zooms in on TB in cage  
 241. TB says "well, what you'ppose that putty cat's up to now?"  
 242. TB looks to right  
 243. scene shifts to outside of window; S on ledge holds on to end of rope  
**244. S jumps off window ledge and flies across screen**  
**245. same as 243, minus S and rope**  
 246. scene shifts to side of other building, with TB sitting in window  
**247. S flies across screen**  
 248. camera angle shifts and shows S smashing against wall next to TB's window  
 249. S drops down vertically

250. same as 246, but TB looking down

251. scene shifts to close-up of TB in cage, looking down; hear banging sound, presumably as S hits the ground

252. TB says "that putty's gonna hurt himself if he's not more careful!"

253. TB looks down

FADEOUT

McNeill, D. (1992). *Hand and Mind. What the Hands Reveal about Thought*. Chicago: Chicago University Press.

### Appendix III: Coding of Path and Manner in Speech

#### Key

v = verb

adv = adverbial

adv:mim = adverbial mimetic

adv:comp = adverbial comparison phrase

~ = can only be used as part of a verb compound

#### Path Coding

Motion Event	Path Expressions in L1 and L2 English	Path Expressions in L1 Japanese
<b>Bowling</b>	<i>along</i> (adv)	<i>agaru</i> (v) 'rise'
<b>Climb</b>	<i>approach</i> (v)	<i>chikazuku</i> (v) 'approach'
	<i>come</i> (v)	<i>hairu</i> + other Path component e.g. <i>iku, kara, ni</i>
	<i>enter</i> (v)	etc. (v) 'enter'
	<i>from</i> (adv)	<i>iku</i> (v) 'go'
	<i>get</i> (v)	<i>kara</i> (adv) 'from'
	<i>go</i> (v)	<i>~komu</i> (v) 'in(to)'
	<i>in</i> (adv)	<i>kuru</i> (v) 'come'
	<i>inside</i> (adv)	<i>made</i> (adv) 'to/until'
	<i>into</i> (adv)	<i>nerau</i> (v) 'aim'
	<i>move</i> (v)	<i>ni</i> (adv) 'to'
	<i>reach</i> (v)	<i>noboru</i> (v) 'climb/ascend' <sup>1</sup>
	<i>through</i> (adv)	<i>nukeru</i> (v) 'go through'
	<i>through</i> (v) *	<i>shinnyuu~suru</i> (v) 'enter into/invade'
	<i>to</i> (adv)	<i>tooru</i> (v) 'go through'
	<i>up</i> (adv)	<i>tsutau</i> (v) 'go along'
		<i>zutto</i> (adv) 'all the way'

<sup>1</sup> Japanese linguists (e.g. Matsumoto, 1996) code *noboru* 'climb' as Path as it can only encode upwards trajectory (*ue ni noboru* 'climb up' / *\*shita ni noboru* 'climb down'), in contrast to its translation equivalent in English, which can be paired with both upwards and downward trajectories (*climb up* / *climb down*) and also because it 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

<b>Bowling</b>	<i>all the way</i> (adv)	<i>hairu</i> + other Path component e.g. <i>iku, kara, ni</i>
<b>Roll</b>	<i>along</i> (adv)	etc. (v) 'enter'
	<i>around</i> (adv)	<i>he</i> (adv) 'to'
	<i>come</i> (v)	<i>idou~suru</i> (v) 'move'
	<i>down</i> (adv)	<i>iku</i> (v) 'go'
	<i>drop</i> (v)	<i>~komu</i> (v) 'in(to)'
	<i>enter</i> (v)	<i>kudaru</i> (v) 'go down'
	<i>fall</i> (v)	<i>made</i> (adv) 'to/until'
	<i>from</i> (adv)	<i>masshigura</i> (adv) 'dash forward'
	<i>get</i> (v)	<i>mukau</i> (v) 'go toward'
	<i>go</i> (v)	<i>ni</i> (adv) 'to'
	<i>in</i> (adv)	<i>ochiru</i> (v) 'fall'
	<i>into</i> (adv)	<i>oriru</i> (v) 'go down'
	<i>on</i> (adv)	<i>tadoritsuku</i> (v) 'reach'
	<i>over</i> (adv)	<i>ugoku</i> (v) 'move'
	<i>push</i> (adv)	<i>zutto</i> (adv) 'all the way'
	<i>reach</i> (v)	
	<i>suck</i> (v)	
	<i>through</i> (adv)	
	<i>to</i> (adv)	
	<i>toward</i> (adv)	
<b>Drainpipe</b>	<i>along</i> (adv)	<i>agaru</i> (v) 'rise'
<b>Climb</b>	<i>approach</i> (v)	<i>hairu</i> + other Path component e.g. <i>iku, kara, ni</i>
	<i>arrive</i> (v)	etc. (v) 'enter'
	<i>back</i> (adv)	<i>he</i> (adv) 'to'
	<i>behind</i> (adv)	<i>iku</i> (v) 'go'

that it can be represented by three different kanji, Chinese characters, only two of which have a clear Path reading. The third kanji, 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 verb. Thus, all cases of *noboru* have been coded as Path, and *yojiru* has been coded separately as Manner.

	<i>beyond</i> (adv) <i>come</i> (v) <i>enter</i> (v) <i>from</i> (adv) <i>get</i> (v) <i>go</i> (v) <i>in</i> (adv) <i>into</i> (adv) <i>on</i> (adv) <i>over</i> (adv) <i>reach</i> (v) <i>to</i> (adv) <i>up</i> (adv)	<i>kara</i> (adv) 'from' <i>~komu</i> (v) 'into' <i>kuru</i> (v) 'come' <i>made</i> (adv) 'to/until' <i>nerau</i> (v) 'aim' <i>ni</i> (adv) 'to' <i>noboru</i> (v) 'climb/ascend' <i>shinnyuu~suru</i> (v) 'enter into/invade' <i>tadoritsuku</i> (v) 'reach' <i>tooru</i> (v) 'go through' <i>tsutau</i> (v) 'go along' <i>tsutawaru</i> (v) 'be transmitted' <i>youtu</i> (v) 'be transmitted' <i>zutto</i> (adv) 'all the way'
<b>Rope</b> <b>Swing</b>	<i>across</i> (adv) <i>enter</i> (v) <i>from</i> (adv) <i>get</i> (v) <i>go</i> (v) <i>in</i> (adv) <i>into</i> (adv) <i>out of</i> (adv) <i>outside</i> (adv) <i>over</i> (adv) <i>reach</i> (v) <i>to</i> (adv)	<i>hairu</i> + other Path component e.g. <i>iku, kara, ni</i> etc. (v) 'enter' <i>he</i> (adv) 'to' <i>iku</i> (v) 'go' <i>kara</i> (adv) 'from' <i>~komu</i> (v) 'into' <i>made</i> (adv) 'to/until' <i>mezasu</i> (v) 'aim/head' <i>mukau</i> (v) 'go toward' <i>nerau</i> (v) 'aim' <i>ni</i> (adv) to' <i>~noru</i> (v) 'ride' <i>shinnyuu suru</i> (v) 'invade' <i>tadoritsuku</i> (v) 'reach' <i>tai~suru</i> (v) 'go toward' <i>toutatsu~suru</i> (v) 'arrive' <i>utsuru</i> (v) 'move' <i>wataru</i> (v) 'cross'



## Manner Coding

Motion Event	Manner Expressions in L1 and L2 English	Manner Expressions in L1 Japanese
<b>Bowling</b> <b>Climb</b>	<i>climb</i> <sup>2</sup> (v) <i>crawl</i> (v) <i>slither</i> (v) <i>sneak</i> (v) <i>squeeze</i> (v)	<i>dondon</i> (adv:mim) 'quickly' <i>guwaa</i> (adv:mim) 'move all at once quickly' <i>kuu</i> (adv:mim) 'quickly and quietly' <i>moguru</i> (v) 'dive' <i>shinobu</i> (v) 'sneak' <i>yojiru~</i> (v) 'clamber'
<b>Bowling</b> <b>Roll</b>	<i>roll</i> (v) <i>round</i> (v) <i>run</i> (v) <i>suck</i> (v)	<i>dondon</i> (adv:mim) 'quickly' <i>gaa</i> (adv:mim) 'bang' <i>gorogoro</i> (adv:mim) 'roll roll' <i>guruguru</i> (adv:mim) 'roll roll' <i>hashiru</i> (v) 'run' <i>kaiten~suru</i> (v) 'rotate' <i>kakeru</i> (v) 'run' <i>korogaru</i> (v) 'roll' <i>korokoro</i> (adv:mim) 'roll roll' <i>nagasareru</i> (v) 'cause to be swept' <i>suberu</i> (v) 'slide' <i>tsu~</i> (v) 'barrel'
<b>Drainpipe</b> <b>Climb</b>	<i>climb</i> (v) <i>crawl</i> (v) <i>creep</i> (v) <i>sneak</i> (v)	<i>gaa</i> (adv:mim) 'bang' <i>shinobu</i> (v) 'sneak' <i>yojiru~</i> (v) 'clamber'

<sup>2</sup> Some have noticed that the verb *climb* in English seems to incorporate Path features indicating ascension. However, since in English this verb can also be combined with other Path expressions such as *down*, *around* etc. and it is typically accompanied by a Path element even in the case of upwards trajectory, it has been coded as primarily a Manner verb in this corpus. For comments on the Japanese translation equivalent of *climb* (*noboru*) see note 1 above.

<b>Rope</b>	<i>buranko</i> (v)(borrowing)	<i>biyoon</i> (adv:mim) 'stretch'
<b>Swing</b>	<i>fly</i> (v)	<i>buranko no youni</i> (adv:comp) 'resemble a swing'
	<i>jump</i> (v)	<i>buranko~suru</i> (v) 'do swing'
	<i>like a pendulum</i>	<i>buun</i> (adv:mim) 'buzz'
	(adv:comp)	<i>byuu</i> (adv:mim) 'whizz'
	<i>like tarzan</i> (adv:comp)	<i>daa</i> (adv:mim) 'quickly and vigorously'
	<i>swing</i> (v)	<i>daan</i> (adv:mim) 'quickly and vigorously'
		<i>furiko-no youni</i> (adv: comp) 'resemble a pendulum'
		<i>janpu-suru</i> (v) 'jump'
		<i>pyoon</i> (adv:mim) 'jump'
		<i>shyuu</i> (adv:mim) 'whizz'
		<i>suwingu</i> (v) 'swing'
		<i>tarzan mitai-ni / no you-ni</i> (adv:comp) 'look like / resemble Tarzan'
		<i>tobu</i> (v) 'fly'
		<i>yurasu</i> (v) 'swing'

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## Curriculum Vitae: Amanda Brown

### Education

- **Ph.D., Applied Linguistics** **2000 - Present**  
*Boston University, USA / Max Planck Institute for Psycholinguistics, The Netherlands*  
 Dissertation: "Crosslinguistic influence in first and second languages: Convergence in speech and gesture", Supervisors: Marianne Gullberg & Shanley Allen. Successfully defended on Nov 6<sup>th</sup> 2006.
- **M.A., English Language Teaching** **1996 - 1997**  
*The University of Essex, Colchester, England*  
 Thesis: "An investigation of the learning strategies used in the memorization of a bilingual word list: A comparison of Japanese and Turkish learners."
- **Accreditation for UCLES Examinations** **1997 - 1999**  
*The University of Cambridge, Cambridge, England*
- **Royal Society of Arts Certificate in English Language Teaching** **1993**  
*Regent College, London, England*
- **BA Honors Economic and Social History** **1989 - 1992**  
*The University of York, York, England*

### Teaching Experience

- **Lecturer** **2002 - Present**  
*Boston University School of Management, Kobe, Japan and Shanghai, China*  
 Provided an intensive off-site English orientation and follow-up English language support program for students beginning a Master's in Business Administration at Boston University. Assisted students in academic writing and professional presentations.
- **Senior Lecturer** **1999 - 2003**  
*Boston University Center for English Language, Boston, USA*  
 Created and taught courses in academic and professional writing, listening, speaking and general communication skills at various levels of proficiency.
- **Teacher** **1999 - 2002**  
*The Boston School of Modern Languages, Boston, USA*  
 Taught general English, academic writing and business courses including business presentations and writing. Wrote a selection of in-house ESL textbooks.
- **Lecturer** **1999**  
*Espiritu Santo University, Guayaquil, Ecuador*  
 Taught a module on "Issues in Language Testing" as part of a Masters in Applied Linguistics / Management of a Bilingual Program.

- **Teacher** **1997 - 1999**  
*The British Council, Guayaquil, Ecuador*  
 Taught English to students of various ages and proficiencies using a non-coursebook, negotiated syllabus. Responsible for curriculum development and test design. Took part in and regularly led in-house professional development sessions, as well as teacher training in the local community. Cambridge University IELTS/UCLES testing.
- **Head Teacher / Teacher Trainer** **1993 - 1996**  
*Nova, Kobe, Japan*  
 Oversaw the day-to-day running of the school, including teacher observations and teachers' meetings. Designed and implemented initial and follow-up training packages for teachers in the mid-western region of Japan.

### Professional Experience

- **Conference Coordinator** **2001 - 2002**  
*Boston University Program in Applied Linguistics, Boston, USA*  
 Took part in the organization of all aspects of the 27<sup>th</sup> Annual Boston University Conference on Language Development (BUCLD), including abstract review and selection, guest speaker selection, website and database management, finances, and editing of proceedings.
- **Senior Research Assistant** **2000 - 2003**  
*Boston University School of Education, Boston, USA*  
 Worked on an NSF-funded research project in collaboration with the Max Planck Institute for Psycholinguistics entitled, "A crosslinguistic, developmental investigation of the relationship between speech and gesture in motion event descriptions," headed by PIs Shanley Allen, Sotaro Kita and Asli Özyürek. Collected, digitized, coded and analyzed English data; participated in the development of a standardized, crosslinguistic coding system for gesture, and developed a corresponding coding system for spontaneous speech in English; investigated methodological issues such as prosodic versus syntactic boundaries in the segmentation of spontaneous speech; contributed to conference presentations and publications; supervised 5 staff members.
- **Research Associate** **2000**  
*Boston University Center for English Language, Boston, USA*  
 Carried out an in-house feasibility study on the possibility of offering a distance learning program in the department, and made recommendations to faculty and management.

### Fellowships and Awards

- **MPI Doctoral Fellowship** **2003 - Present**  
*Max Planck Institute for Psycholinguistics, The Netherlands*
- **Applied Linguistics Doctoral Fellowship** **2004 - 2005**  
*Boston University, Boston, USA*

- **Applied Linguistics Doctoral Fellowship** **2003 - 2004**  
*Boston University, Boston, USA*
- **NSF Research Assistantship** **2000 - 2003**  
*Boston University, Boston, USA*
- **M.A. Thesis awarded 'distinction' (highest award)** **1997**  
*The University of Essex, Colchester, England*

## Publications

Brown, A. & Gullberg, M. (in preparation). Bidirectional crosslinguistic influence in L1-L2 encoding of Manner in speech and gesture: An investigation of Japanese speakers of English. *Studies in Second Language Acquisition*.

Özyürek, A., Kita, S., Allen, S., Furman, R., Brown, A., & Ishizuka, T. (submitted). Co-speech gestures reveal children's on-line conceptualization during speaking: Evidence from Turkish and English speakers. *Developmental Psychology*.

Brown, A., Allen, S., Özyürek, A., Kita, S., & Ishizuka, T. (under review). The acquisition of syntactic framing in motion event descriptions: What co-speech gestures reveal about formulaic speech in L2 production. *IRAL*.

Kita, S., Özyürek, A., Allen, S., Brown, A., Furman, R., & Ishizuka, T. (in press). Relations between syntactic encoding and co-speech gestures: Implications for a model of speech and gesture production. *Language and Cognitive Processes*.

Allen, S., Özyürek, A., Kita, S., Brown, A., Furman, R., & Ishizuka, T. (2006). Language-specific and universal influences in children's syntactic packaging of Manner and Path: A comparison of English, Japanese and Turkish. *Cognition*, 102:16-48.

Rohlfing, K. J., Loehr, D., Duncan, S., Brown, A., Franklin, A., Kimbara, I., Milde, J., Parrill, F., Rose, T., Schmidt, T., Sloetjes, H., Thies, A. & Wellinghoff, S. (2006). Comparison of multimodal annotation tools: A workshop report. *Gesprächsforschung* 7

Özyürek, A., Kita, S., Allen, S., Furman, R., Brown, A. (2005). How does linguistic framing influence co-speech gestures? Insights from crosslinguistic differences and similarities. *Gesture*, 5.

Brown, A., Gullberg, M. (2005). Convergence in emerging and established language systems: Evidence from speech and gesture in L1 Japanese. *Handbook of the 7<sup>th</sup> Annual International Conference of the Japanese Society for Language Sciences*, Tokyo.

Brown, A. (2005). Short Review of S. Goldin-Meadow's *The Resilience of Language*. *Linguistics*, (43).

Brown, A., Özyürek, A., Allen, S., Kita, S., Ishizuka, T., Furman, R. (2005). Does event structure influence children's motion event expressions? Online Proceedings Supplement of the 29<sup>th</sup> Annual Boston University Conference on Language Development. Available at: <http://www.bu.edu/linguistics/APPLIED/BUCLD/proc.html>

Beachley, B., Brown, A., Conlin, F. (Eds) (2003). Proceedings of the 27<sup>th</sup> Annual Boston University conference on Language Development. Cambridge, MA. Cascadilla Press.

Allen, S., Özyürek, A., Kita, S., Brown, A., Turanli, R., Ishizuka, T. (2003). Early speech about manner and path in Turkish and English: Universal or language-specific? In Beachley, B., et al. Proceedings of the 27<sup>th</sup> Annual Boston University Conference on Language Development. Cambridge, MA. Cascadilla Press.

### **Invited Presentations**

Brown, A. (July, 2006). Blending of typology: The case of acquisition. Paper presented at Dept. of Linguistics Colloquium Series, Kobe University, Japan.

Brown, A. (April, 2006). Revealed as an L2 user: Features of L2 gestures in L1 production. Paper presented at the Gesture Workshop, Groningen, The Netherlands.

Özyürek, A., Kita, S., Allen, S., Furman, R., Brown, A., & Ishizuka, T. (April, 2006). Crosslinguistic Development in Spatial Thinking and Speaking: Insights from Co-Speech Gesture. Paper presented at the Gesture Workshop, Groningen, The Netherlands.

Brown, A. (April, 2006). Consequences of contact: Synchronic change within individuals. Paper presented at the Nijmegen Bilingualism Group, Nijmegen, The Netherlands.

Brown, A. (February, 2006). Interactions between emerging and established language systems: Evidence from speech and gesture. Paper presented at the Dept. of English Colloquium Series, University of South Carolina, USA.

Brown, A. (2005). When two languages meet: Loss or gain? Paper presented at the Applied Linguistics Research Sharing Forum, Boston University, USA.

Brown, A. (2004). The effects of language typology and language proficiency on motion event descriptions in second language acquisition: Evidence from speech and gesture. Paper presented at the Applied Linguistics Research Sharing Forum, Boston University, USA.

Brown, A. (2003). Semantic omissions in motion event descriptions from 3-year-old English speakers. Paper presented at the Applied Linguistics Research Sharing Forum, Boston University, USA.

Brown, A. (2000). Distributed learning in ESL: A future for Boston University? Paper presented at the Colloquium Series, Center for English Language and Orientation Programs, Boston University.



Brown, A. (1999). Teaching children grammar. Paper presented at the Colloquium Series, The British Council, Guayaquil, Ecuador.

Brown, A. (1998). Learning strategies for vocabulary. Paper presented at the FENAPIUPE National Teachers' Conference, Guayaquil, Ecuador.

### **Refereed Presentations**

Brown, A. (November, 2006). Development of a mature L1: Impact of exposure to an L2. Paper presented at the 31<sup>st</sup> Annual Boston University Conference on Language Development. (BUCLD), Boston, USA.

Brown, A., Gullberg, M. (October, 2006). Changes in L1 Encoding of Motion after Exposure to an L2. Paper presented at the 2<sup>nd</sup> Annual International Conference of the German Cognitive Linguistics Association, Munich, Germany.

Allen, S., Özyürek, A., Kita, S., Brown, A., Furman, R., & Ishizuka, T. (October, 2006) Crosslinguistic developmental differences in the encoding of Manner and Path: Evidence from speech and gesture. Paper presented at the 2<sup>nd</sup> Annual International Conference of the German Cognitive Linguistics Association, Munich, Germany.

Brown, A., Gullberg, M. (September, 2006). Effects of an L2 on the L1 in Expression of Path in Speech and Gesture. Paper presented at the 16<sup>th</sup> Annual European Second Language Association Conference (EUROSLA), Antalya, Turkey.

Brown, A., Gullberg, M. (September, 2005). Convergence in emerging and established language systems: Evidence from speech and gesture. Poster presented at the 2<sup>nd</sup> Annual International Conference on First Language Attrition (ICFLA), Amsterdam, The Netherlands.

Allen, S., Kita, S., Brown, A., Furman, R., Ishizuka, T. (July, 2005). Is syntactic packaging of manner and path language-specific at age 3? Paper presented at the 10<sup>th</sup> International Conference for the Study of Child Language (IASCL), Berlin, Germany.

Brown, A., Sloetjes, H. (June, 2005). Introduction to ELAN (EUDICO Linguistic Annotator). Paper presented at the Tools Workshop, 2<sup>nd</sup> International Society for Gesture Studies Conference: Interacting Bodies, Lyon, France.

Brown, A., Gullberg, M. (June, 2005). Interactions between dual language systems in a single mind: Evidence from gesture. Paper presented at the 2<sup>nd</sup> International Society for Gesture Studies Conference: Interacting Bodies, Lyon, France.

Furman R., Özyürek, A., Allen, S., Brown, A. (June, 2005). What do gestures reveal about children's causal event representations? Paper presented at the 2<sup>nd</sup> International Society for Gesture Studies Conference: Interacting Bodies, Lyon, France.

Brown, A., Gullberg, M. (June, 2005). Convergence in emerging and established language systems: Evidence from speech and gesture in L1 Japanese. Poster presented at the 7<sup>th</sup> Annual International Conference of the Japanese Society for Language Sciences (JSLS), Tokyo, Japan.

Brown, A., Özyürek, A., Allen, S., Kita, S., Ishizuka, T., Furman, R. (November, 2004). Does event cognition influence children's motion event descriptions? Poster presented at the 29<sup>th</sup> Annual Boston University Conference on Child Language Development (BUCLD), Boston, USA.

Brown, A., Allen, S., Özyürek, A., Kita, S., Ishizuka, T., Furman, R. (September, 2004). What co-speech gestures reveal about L2 proficiency: A study of Japanese learners of English. Poster presented at the 14<sup>th</sup> Annual European Second Language Association Conference (EUROSLA), San Sebastian, Spain.

Brown, A., Gullberg, M. (October, 2004). Bilateral language effects in learner language systems: Evidence from speech and gesture. Poster presented at the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO) Cognition Summer School, Doorwerth, The Netherlands.

Özyürek, A., Allen, S., Kita, S., Kokal, I., Turanli, R., Brown, A. (2003). How to solve the language learning task: Speech-gesture mismatches as an index of spatial language development in Turkish children. Paper presented at the Piaget Society Meeting, Chicago.

Özyürek, A., Kita, S., Allen, S., Brown, A., Turanli, R., Ishizuka, T. (2003). Gesture accompanying narratives in child Turkish and English: Universal or language-specific? Paper presented at the Biennial Meeting of the Society for Research on Child Development, Tampa, USA.

Allen, S., Özyürek, A., Kita, S., Brown, A., Turanli, R. (2002). Language specific and universal influences on motion event expressions. Paper presented at the 31<sup>st</sup> Child Language Research Forum (CLRF), Stanford, USA.

Kita, S., Özyürek, A., Allen, S., Brown, A. (2002). Crosslinguistic variation of iconic gestures accompanying motion event descriptions. Paper presented at the 76<sup>th</sup> Annual Conference of the Linguistic Society of America (LSA), San Francisco, USA.

Allen, S., Özyürek, A., Kita, S., Brown, A., Turanli, R., Ishizuka, T. (2002). Early speech about manner and path in Turkish and English: Universal or language-specific? Paper presented at the 27<sup>th</sup> Annual Boston University Conference on Language Development (BUCLD), Boston, USA.